



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

**Tender Documents – VMS & RMCMS (M/s MAHAGENCO
Bhusawal Project)**

Sl. No.	Description	Remarks/Dates
1.	Tender RFQ Reference	PRV0000038
2.	RFQ Date	As per NIT @ https://eprocurebhel.co.in website
3.	RFQ Due Date	
4.	Tender Documents Available on	https://eprocurebhel.co.in website
List of Tender Documents		
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CE:PR:001- Rev 03

INSTRUCTIONS TO BIDDERS

Bidder is requested to read the instructions carefully and submit their quotation taking into consideration of all the points:

A. GENERAL INSTRUCTIONS:

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: CE: PR: 001 – Rev 03), General Conditions of Contract (document reference: CE: PR: 002 - Rev 02) and Special Conditions of Contract, if any, of the enquiry.
2. Any deviations from or additions to the “General Conditions of Contract” or “Special Conditions of Contract” require BHEL’s express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Regret letter (either through post or by mail or by EPS) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender.

Supplier shall be liable for removal as a registered vendor of BHEL when the supplier fails to quote against four consecutive tender enquiries for the same item or all enquiries in last two years for the same item, whichever is earlier.

4. Procurement directly from the manufacturers is preferred. However, if the OEM/ Principal insist 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. Agent/Representative authorized by the OEM/Principal in turn cannot further sub authorize any other firm for submitting the offer or for placement of order.

In case bids are received from the manufacturer/ supplier and his agent, bid received from the agent shall be ignored.

5. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
6. If an Indian representative/associate/liaison office quotes on behalf of a foreign based bidder, such representative shall furnish the following documents:
 - a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
 - b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
 - c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages/damages/replacement/repair of imported scope

till the equipment is commissioned and handed over to customer will be the sole responsibility of the Indian representative/associates/agent/liaison office.

d. Refer **Annexure I** on “Guidelines for Indian Agents”.

7. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport /Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment.

Warehousing charges due to incomplete or missing documentation will be to supplier’s account. All offers for imported scope of supply by air, must be made from any of the gateway ports (within the country) indicated **(Refer Annexure II)**.

8. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: http://www.bhel.com/vender_registration/vender.php
9. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices/misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike/lockout for a long period. Bidder may refer “Guidelines for Suspension of Business Dealings with Suppliers/ Contractors” available on www.bhel.com for more details.

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies / guidelines.

10. 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 your notice.
11. Offer is to be submitted in English language only.
12. For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-local supplier and purchase preference to Class-I local supplier, is as defined in Public procurement (Preference to Make in India), Order 2017 dated 16.09.2020 issued by DPIIT.

In case of subsequent Orders issued by the Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of price bids against this NIT. Default margin of purchase preference shall be 20% for Class-I local supplier only.

13. The Bidder shall mandatorily submit Declaration as mentioned under Rule 144(xi) of General Financial Rules, 2017 amendment dt 23.07.2020 issued by Ministry of Finance, Govt. of India. Where applicable, evidence of valid registration by the Competent Authority shall be attached.

The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). Refer Annexure-X for ‘Restrictions under Rule 144(Xi) of General Financial Rules,2017 amendment dt: 23.07.2020’.

B. GUIDELINES FOR PREPARATION OF OFFER:

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
 - **SINGLE PART BID:** Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
 - **TWO PART BID:** Unpriced offer i.e. “Techno-commercial Bid” with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the “Price Bid” without the prices** should be enclosed in one cover and the cover must be super scribed **“Techno-commercial offer)** and Priced offer i.e. “Price Bid” containing price summary in a separate sealed envelope and must be super scribed **“Price Bid”**.

Both these envelopes shall be enclosed in a single sealed envelope superscribed with enquiry number, due date of tender and any other details as called for in the tender document.

- **THREE PART BID:** Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope superscribed with enquiry number, due date of tender and any other details as called for in the tender document.

If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission (or) if any part of the offer is incomplete, the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to superscribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is “Techno Commercial Bid” or “Price Bid” or “Pre-Qualification Bid”.

Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.

3. BHEL standard Commercial Terms and Conditions (duly filled, signed & stamped) must accompany Technical-Commercial offer without fail and should be submitted in original only.

The above indicated submission of Offers in “sealed envelope/hard copy” as mentioned in points B.1-B.3 is applicable for tenders that are not floated through E-Procurement System (EPS).

4. Validity: Unless otherwise specified in SCC (special commercial conditions of contract), the offer will be valid for a period of 90 days from the date of part-I bid opening and in case of Negotiation/Counter-offer/Reverse Auction, price validity will apply afresh for a period of 60 days from the date of according final price by bidder (or) up to original validity period, whichever is later.
5. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid.

If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without deviation.

6. Deviation to this specification/item description, if any, shall be brought out clearly indicating “DEVIATION TO BHEL SPECIFICATION” without fail, as a part of Techno-Commercial Bid.

If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.

7. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and/or any other relevant documents called in purchase specification as part of Technical Bid.
8. "Price Bid" shall be complete in all respects containing price break-up of all components along with all applicable taxes and duties, freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the "Price Bid." Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.
9. In addition, bidder shall also quote for erection & commissioning charges/erection supervision & commissioning charges (E&C service charges), documentation charges, testing Charges (type & routine), training charges etc. if & as applicable along with corresponding tax. The price summary must indicate all the elements clearly.
10. Wherever applicable, bidders should indicate "lumpsum" Erection and Commissioning (or) Erection Supervision and Commissioning charges, as applicable (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for carrying out E&C activity and further handing over to customer.
The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist (if any).
11. Wherever bidders require PAC (Project Authority Certificate)/applicable certificates for import of raw materials, components required for DECC,EPCG Power Projects, Export Projects or other similar projects wherein supplies are eligible for customs duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.
12. Prices should be indicated in both figures & words. Bid should be free from correction/overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.
Any typographical error, totalling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure III** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid" and BHEL decision will be final.
13. Documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder. However, this requirement is not mandatory for offers uploaded through E-Procurement System (EPS).

C. GUIDELINES FOR OFFER SUBMISSION:

The under-mentioned clauses 1, 2&3 will not be applicable for EPS tenders.

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in our reception area with caption "CE, SC&PV, DEFENCE".

Tenders are opened on 3 days in a week (Monday/Wednesday/Friday). Tender must be deposited in the slot corresponding to the day (Monday - Box no.4/Wednesday - Box no. 6 /Friday - Box no.8) while depositing the offer.

2. E-Mail/ Internet/EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email ID specified in the SCC document of the tender.
3. Offers of Vendors who already have a valid Technical/Commercial MOU with BHEL-EDN for the items of the RFQ shall mention the relevant MOU reference no. and give only such other details not covered in the MOU.

4. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over either of the two purchase officers whose names are mentioned in the SCC document of tender RFQ.
5. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. For EPS tenders, e-mail notifications will be automatically generated and forwarded to registered e-mail ID/s of bidders during opening of tenders.
6. Bidder will be solely responsible:
 - a. For submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
 - b. For submission of offers in the correct compartment of the tender box based on the day of due date (Monday/Wednesday/Friday). Please check before dropping your offer in the correct tender box.
 - c. For depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong tender box (or) if the tender document is handed over to the wrong person, BHEL will not be responsible for any such delays.
 - d. For offers received through email etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time (This clause will not be applicable for EPS tenders).

The above indicated submission of Offers as mentioned in points 6.a-6.d is applicable for tenders that are not floated through EPS.

- e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, system/software requirements etc. will be the sole responsibility of the bidder.

Wherever assistance is needed for submission of e-tenders, help-line numbers as available in the website of service provider of BHEL may be contacted.

Purchase Executive/ BHEL shall not be responsible for any of the activities relating to submission of offer.

D. PROCESSING OF OFFERS RECEIVED:

1. Any discount/ revised offer submitted by the supplier on its own shall be accepted provided it is received on or 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 unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes/revisions are requested by BHEL.
In case of withdrawal of any Technical/Commercial deviation(s) by the bidder before opening of price bids/conducting the Reverse Auction, revision of price/impact bid will not be accepted.
3. In case there is no change in the technical scope and/ or specifications and/ or commercial terms & conditions, the supplier will not be allowed to change any of their bids after Technical bids are opened (after the due date and time of tender opening).
4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL

and it accounts for price implications from bidders, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid.

Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening.

5. Un-opened bids (including price bids) will be returned to the respective bidders after release of Purchase order.

Regarding Offers for EPS tenders that get rejected on PQC/ techno-commercial grounds, the bids for the subsequent parts will not be opened i.e., both technical bid and price bid (Parts-II & III) will not be opened in case of rejection on PQC ground and price bid (Part-II/Part-III, as applicable) will not be opened in case of rejection on techno-commercial ground.

6. After receipt of Purchase Order, supplier should submit required documents viz., specified drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report, O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/ Customer.
7. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL and agreed upon in the Purchase Order.
8. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL").

"Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and/or duties (as applicable), freight charges, taxes on Services, customs clearance charges for imported items, any other cost indicated by bidder for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions).

Benefits arising out of Nil Import Duty on DEEC, EPCG, DFIA Projects, Physical Exports or such 100% exemptions (statutory benefits), project imports, customer reimbursements of statutory duties (like Basic Customs Duty and cess on customs duty), Input tax credits as applicable will also be taken into account for arriving at the Total cost to BHEL (wherever applicable and as indicated in SCC document of tender).

For EPS tenders, it shall be noted that the prices (including discounts) vis-a-vis currency quoted in EPS portal only will be considered as Final for the purpose of evaluation of the lowest bidder.

Bidder shall ensure to indicate the applicable taxes against each line item in online portal, failing to which the same will be considered as inclusive/NIL.

In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

9. The evaluation currency for this tender shall be INR. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids: Date of tender opening

Two/three part bids: Date of Part-I bid opening

Reverse Auction: Date of Part-I bid opening

In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.

10. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers.
11. GeM Seller ID shall be mandatory before placement of order/award of contract for goods and services to the successful bidder(s), for orders exceeding Rs.25 lakhs (including all taxes etc.). Department of Expenditure (DoE) OM no.6/9/2020-PPD dated: 24.08.2020 may be referred in this regard.

E. INFORMATION ON PAYMENT TERMS:

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format (**Refer Annexure IV**) for receiving all payments through NEFT.(Applicable for Indian vendors only).
2. In case of High Sea Sales transaction, customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.
All warehousing charges due to delay in submission of complete and or correct HSS documents to BHEL will be to supplier's account only. Such recovery will be made out of any of the available bills (**Refer Annexure V**).
3. Statutory deductions, if any, will be made and the deduction certificate shall be issued.
 - A. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.
In addition to the above, Foreign vendors shall also submit relevant details of their bankers like Swift Code, Banker's Name &Address etc.
 - B. TDS deduction as per section 51 of CGST Act,2017 shall be applicable as per Gazette Notification No. 50/2018-Central Tax, Dated: 13th September 2018 and subsequent notification/s, as and when released by Govt. authorities.
4. Levy and Collection of TCS by the seller of goods u/s 206C (1H) shall be in compliance with Govt. norms. The seller shall raise the invoice including the amount of TCS in the Tax Invoice and no separate debit note will be entertained.
The seller should indicate his PAN number and TAN number in the Invoice. The seller should remit the TCS so collected from BHEL and provide TCS certificate/s with invoice no., invoice date, Amount etc.
If by any chance seller is not remitting /not able to submit TCS certificates to BHEL on time, then the TCS amount with penalty, if any applicable will be recovered from seller in the available bills.
5. Incomplete documentation will not be accepted. Delayed submission of invoice / documents may result in corresponding delay in payment. In this connection, request to also refer clause: G about invoicing & payment formalities under GST regime.
Applicable documents shall be submitted to the purchaser at the time of execution of supplies/services for availing GST input credits.

F. STANDARD PAYMENT TERMS OF BHEL-EDN:

<u>PURCHASE ORDERS FOR:</u>	<u>SUPPLY WITH SERVICE(S)</u>	<u>SUPPLY ONLY</u>
<u>INDIGENOUS PROCUREMENT</u>	<p>a. 100% of basic value with taxes and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation, whichever is later.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>b. 100% of PO value with taxes and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation, whichever is later.</p>
<u>IMPORT PROCUREMENT</u>	<p>c. 100% of basic value will be paid against usance draft of 45 days from the date of AWB/BOL on submission of complete set of documents.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>d. 100% of PO value will be paid against usance draft of 45 days from the date of AWB/BOL on submission of complete set of documents.</p>
<u>HIGH-SEA SALES PROCUREMENT</u>	<p>e. 100% of basic value will be paid in 45 days from the date of signing of High Sea Sale agreement or 15 days from the date of submission of complete set of documentation, whichever is later</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>f. 100% of basic value will be paid in 45 days from the date of signing of High Sea Sale agreement or 15 days from the date of submission of complete set of documentation, whichever is later.</p>

g. Erection and Commissioning:

Evaluation methodology: Unless and otherwise specified in SCC, E&C charges should not be less than 10% of the main supply value. In case the quoted total E&C value is less than 10% of the main supply value, BHEL shall

evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

Payment term: 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

h. Erection Supervision and Commissioning:

Evaluation methodology: Unless and otherwise specified in SCC, E&C charges should not be less than 5% of the main supply value. In case the quoted total E&C value is less than 5% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

Payment term: 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

i. Comprehensive Annual Maintenance Contract:

Evaluation methodology: Unless and otherwise specified in SCC, CAMC will be applicable for a period of 04 years from the date of expiry of warranty period (or) from the date of completion of commissioning of equipment, whichever is later and the total CAMC value should not be less than 20% of the main supply value. In case the quoted total CAMC value is less than 20% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards CAMC charges.

Payment terms: 100% CAMC charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of CAMC on yearly basis.

j. Terms of Payment for Training: 100% payment will be made in 45 days from the date of completion of Training or 15 days from the date of submission of complete set of invoice along with documentary evidence, whichever is later.

LOADING FACTORS FOR DEVIATION IN PAYMENT TERMS (APPLICABLE FOR IMPORT PROCUREMENT ONLY):

- 1) For offers received with Sight draft payment term in place of Usance draft, loading applicable will be 1.0% of basic value.
- 2) For offers received with Letter of Credit payment term with Usance of 45 days, loading applicable will be 2.5% of basic value.
Additional loading of 2% will be applicable for payment term as Letter of Credit at Sight.
- k. Any payment term with credit period of less than 45 days for indigenous supply/HSS and any other variation of payment terms are liable for rejection.
- l. Standard payment terms indicated in Clauses: F (a), (b), (c), (d), (e), (f), (g), (h), (i) & (j) will not attract any loading.

Note 1: Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C and AMC charges (wherever applicable). Wherever the Purchase Order is split into import portion and indigenous portion of supply, minimum % to be quoted for Services, wherever mentioned, will be of both purchase order values put together.

Note 2: In case of multiple packages/units in a power plant, payment of E&C charges will be processed on pro-rata basis.

Note 3: No deviation will be permitted from the duration of Guarantee/Warranty and/or Comprehensive Annual Maintenance Contract period specified in SCC.

G. Terms & Conditions to be complied under GST regime:

1. All invoices to contain BHEL-EDN (buyer) GSTIN number: 29AAACB4146P1ZB. However for CGST +SGST/UGST billing outside the state of Karnataka, invoice has to be generated with BHEL's Nodal Agency GSTIN number. Address of Nodal Agency along with GSTIN number will be provided by BHEL at the time of issuing dispatch clearance.
2. The Bidder shall mention Bidder's GSTIN number in all quotations and Invoices submitted.
3. The Bidder shall also mention HSN (Harmonized System of Nomenclature) / SAC (Services Accounting Code) mandatorily in all quotations and invoices submitted.
4. Invoice submitted should be in the format as specified under GST Laws viz., all details as mentioned in Invoice Rules like GST registration number(GSTIN), invoice number with date of issue, quantity, rate, value, taxes with nomenclature – CGST, SGST, UGST,IGST mentioned separately, HSN Code / SAC Code etc. Invoice should be submitted in original for buyer plus duplicate for credit availment.
5. Payment of GST to Vendor will be made only if it is matching with data uploaded by the Vendor in GST portal.
6. For invoices paid on Reverse charge basis – “Tax payable on reverse charge basis” to be mentioned on the invoice.
7. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount will be recoverable from vendor along with interest levied/ leviable on BHEL.
8. In case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law will be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.
9. Vendor should intimate BHEL immediately on the same date of invoicing without any delay.
10. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the supplies, within the calendar month notified by BHEL.
11. Bidders to note that Rules & Regulations pertaining to E-way bill system are to be strictly adhered to, as and when notified by Govt. authorities.
12. As per Notification 88/2020-Central Tax dated 10th November 2020 (applicable w.e.f. 01 January 2021), the turnover for applicability of E-invoicing provisions has been reduced from 500 crores to 100 crores. In other words, registered person [other than a SEZ unit and those referred in Rule 54(2), 54(3), 54(4) and 54(4A) of the CGST Rules], whose aggregate turnover in any preceding financial year from 2017-18 onwards exceeds 100 crores, is required to comply with the requirement of IRN and QR code in respect of supply of goods or services or both to a registered person or for exports.

H. Performance bank guarantee (PBG):

Performance bank guarantee (PBG) will be applicable as called in the tender documents. Unless otherwise specified in the SCC, the PBG against performance of the contract shall be valid for a period of 24 months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10 % of the basic value of the purchase order which will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C and AMC charges (wherever applicable).

1. The BG issued in Indian Rupees by Banks in India is to be executed on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Bank issuing the guarantee.
2. No deviation for the duration and value of PBG will be permitted.
3. PBG shall be from any of the BHEL consortium of bankers (**refer Annexure VI**).
4. PBGs from nationalized banks are also acceptable.
5. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order.
6. PBG should be in the format specified (**refer Annexure VII**). No deviation to this format will be allowed. However in case BHEL changes the PBG format, bidder shall honor the same.
7. Bank Guarantee should be enforceable in Bangalore.
8. In Case of Bank Guarantees submitted by Foreign Vendors-
 - a. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in Bangalore.
 - b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)
 - b.1 Please note that Bank Guarantee issued by any of the Consortium Banks only will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter-Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It shall be noted that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor.
 - b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at sl.no. b.1 is required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time).
9. Expired PBGs will be returned only after expiry of the claim period.
10. PBG shall not be applicable for spares.

I. PROVISIONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES) :

Benefits/facilities as applicable for Micro and Small Enterprises (MSEs) shall be available to MSEs registered with Government designated authorities as per the Purchase & Price Preference Policy of the Government subject to them becoming eligible otherwise.

Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration. Vendors have to submit the Udyog Aadhaar certificate along with attested copy of a CA certificate (Annexure VIII) or Udyam Registration certificate applicable for the relevant financial year (latest audited) along with the tender documents in the Part-I bid to avail the applicable benefits.

Date to be reckoned for determining the deemed validity will be the date of bid opening (Part-I in case of two-part bid and three-part bid).

Documents have to be notarized/attested by a Gazetted officer and must be valid as on the date of part I bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Please note that no benefit shall be applicable if any deficiency in the above required documents are not submitted before the price bid opening/Reverse Auction. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal.

Bidders to however note the documents that shall be furnished in order to establish credentials as MSE vendor should be as per the extant statutory requirements specified by the Ministry of Micro, Small and Medium Enterprises.

PURCHASE PREFERENCE FOR MSE VENDORS:

In tender, participating MSEs quoting price within price band of L1+15 percent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price from someone other than a MSE and such MSE shall be allowed to supply at least 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately (to tendered quantity).

- 3% of the 25% will be earmarked for women owned MSEs.
- 25% of the 25% (i.e., 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) & (2) are fulfilled.
- In case where no SC/ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender.

In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items/quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc., then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1. Such information that tendered quantity will not be split, shall be indicated in the SCC.

J. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:

1. Commitment by BHEL: BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.
2. Commitment by Bidder(s)/ Contractor(s):
 - a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
 - b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
 - c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. The Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain or pass on to others, any information or document provided by BHEL as part of business relationship.
 - d. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made,

and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

K. Integrity Pact (IP):

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

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

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

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

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

Annexure

Annexure I
Guidelines for Indian Agents

- **Definition of Indian Agent:** An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

In case of yes, vendor to note the following and reply accordingly:

- BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure - 'A' shall apply in all such cases.

- viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL as per the extant guidelines of Supplier Evaluation, Approval & Review Procedure (SEARP), before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed). It will be the responsibility of the OEM/ foreign principal to get acquainted with the evaluation requirements of Indian supplier/ agent as per SEARP available on www.bhel.com.

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

--x--

Vendor's Signature with Seal

Guidelines for Indian Agents of Foreign Suppliers

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 **Disclosure of particulars of agents/ representatives in India, if any.**
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:
 - 2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent/ representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
 - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
 - 2.1.3 Confirmation of the Tenderer that the commission/ remuneration, if any, payable to his agents/ representatives in India, may be paid by BHEL in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
 - 2.2.1 The Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.
 - 2.2.2 The amount of commission/ remuneration included in the price (s) quoted by the Tenderer for himself.
 - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/ representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

ANNEXURE - II
LIST OF INTERNATIONAL GATEWAY AIRPORTS

For air based consignment, terms of delivery will be on FCA basis from following listed airports only. Vendors are requested to verify this list for use before submission of offer.

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

ANNEXURE – III

DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

(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 the purchaser 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; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

(d) If there is such discrepancy in an offer, 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 purchaser, the bid is liable to be ignored.

ANNEXURE - IV
Electronic Funds Transfer (EFT) OR
Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): _____ CREATE _____ CHANGE

BHEL Vendor / Supplier Code:

Company Name :

Permanent Account Number(PAN):

Address

City: PINCODE STATE

Contact Person(s)

Telephone No:

Fax No:

e-mail id:

1 Bank Name:

2 Bank Address:

3 Bank Telephone No:

4 Bank Account No:

5 Account Type: Savings/Cash Credit

6 9 Digit Code Number of Bank and branch appearing on MICR cheque issued by Bank

7 Bank IFSC Code(applicable for NEFT)

8 Bank IFSC code(applicable for RTGS) (Indian Financial System Code)

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation: _____ Telephone No. with STD Code _____

Company Seal

Bank Certificate

We certify that _____ has an Account No _____ with us and we confirm that the bank details given above are correct as per our records.

Date: _____ (.....)

Place: _____ Signature _____

Please return completed form along with a blank cancelled cheque or photocopy thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call concerned purchase executive.

ANNEXURE - V
PRESENT PROCEDURE FOR SALE IN TRANSIT (HIGH SEA SALES)

In case of High Sea Sales, vendor should submit following documents:

1. ORIGINAL HIGH SEA SALES AGREEMENT

- Sale agreement (on Rs. 200/- non-judicial stamp paper & notarised with 2 witnesses with identity) has to be signed between BHEL and the Party importing material. The date of the sale documents should be in between the date of House Air Way Bill / Bill of Lading and before landing of the goods in Indian origin.
- Following shall be included in the High Sea Sales Agreement:
"THE BUYER ALSO UNDERTAKE DISCHARGES, THE OBLIGATION AND FULFILLMENT OF CONDITIONS, IF ANY, ATTACHED TO THE IMPORTATION, ASSESSMENT AND CLEARANCE OF THE GOODS IN TERMS CUSTOMS TARIFF ACT 1975, THE CUSTOMS ACT 1962 & RULES & REGULATIONS MADE THERE UNDER AND OTHER RELEVANT ACTS, ORDERS, NOTIFICATIONS".

2. ORIGINAL INVOICES: INDIGENOUS RUPEE INVOICE & FOREIGN CURRENCY INVOICE

- Prices should be C.I.F., designated airport/seaport basis.
- I.E.C., C.S.T., K.S.T. Nos. to be mentioned.
- Description of item (Nomenclature), Unit & Quantity in both the Foreign Currency & the Indigenous Invoice in Rupee shall be exactly as per Purchase Order Description of item, Quantity and Unit. The Indigenous Invoice value shall be exactly as per Purchase Order value.
- Seller should give Foreign Currency Invoice from the original consignor. The Foreign Currency Invoice value should be at least 2% (two per cent) less than the Indigenous Rupee Invoice value in equivalent foreign currency.

4. ORIGINAL HOUSE AIR WAY BILL/ BILL OF LADING

- The sale agents should duly endorse House Air Way Bill (HAWB) for air shipments or original Bill of Lading (O.B.L.) for sea shipments and Foreign Currency Invoice in favour of BHEL-EDN.

5. ORIGINAL CARGO ARRIVAL NOTICE FROM FORWARDER.

6. ORIGINAL DELIVERY ORDER ISSUED IN NAME OF BHEL-EDN.

7. ORIGINAL PACKING LIST.

8. A LETTER TO THE COMMISSIONER OF CUSTOMS FOR EFFECTING ABOVE SALE.

9. A LETTER TO THE DEPUTY ASSESSOR (OCTROI) FOR EFFECTING ABOVE SALE IN FAVOUR OF BHEL.

REMARKS: In case vendor needs any clarifications on the above, the same may be sought in writing.



ELECTRONICS DIVISION, BANGALORE

Annexure-VI

BHEL MEMBER BANKS (LIST OF CONSORTIUM BANKS)

Bank Guarantee (BG) shall be issued from the following banks only:

Sl. No.	Nationalised Banks	Sl. No.	Public Sector Banks
1	Allahabad Bank	18	IDBI
2	Andhra Bank		
3	Bank of Baroda	Sl. No.	Foreign Banks
4	Canara Bank	19	CITI Bank N.A
5	Corporation Bank	20	Deutsche Bank AG
6	Central Bank	21	The Hongkong and Shanghai Banking Corporation Ltd. (HSBC)
7	Indian Bank	22	Standard Chartered Bank
8	Indian Overseas Bank	23	J P Morgan
9	Oriental Bank of Commerce		
10	Punjab National Bank	Sl. No.	Private Banks
11	Punjab & Sindh Bank	24	Axis Bank
12	State Bank of India	25	The Federal Bank Limited
13	Syndicate Bank	26	HDFC Bank
14	UCO Bank	27	Kotak Mahindra Bank Ltd
15	Union Bank of India	28	ICICI Bank
16	United Bank of India	29	IndusInd Bank
17	Vijaya Bank	30	Yes Bank

Note:

- All BGs must be issued from BHEL consortium banks listed above.
- This list is subject to changes. Hence vendors are requested to check this list every time before issuing BGs.
- Bank Guarantees issued by Co-operative Banks/Financial Institutions cannot be accepted under any circumstance.

Annexure-VII

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at _____² hereinafter referred to as the 'Vendor / Contractor / Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs --⁶ (Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We thebank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till

all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

WeBANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier 's liabilities.

This Guarantee shall remain in force upto and including.....⁷ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the⁸we shall be discharged from all liabilities under this guarantee thereafter.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁶
- b) This Guarantee shall be valid up to⁷
- c) Unless the Bank is served a written claim or demand on or before⁸ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

Certificate by Chartered Accountant on letterhead

This is to certify that M/s _____
(hereinafter referred to as 'enterprise') having PAN Number _____ and
UDYAM Registration Number _____, registered office at _____
_____ is falling under the category
_____ (**Micro / Small / Medium**) under MSMED Act 2006. (Copy of UDYAM Registration
Certificate to be enclosed).

The said classification of _____ (**Micro / Small / Medium**) is arrived at based on the
Notifications / guidelines / clarifications issued under Micro, Small and Medium Enterprises
Development Act, 2006 including the notification S.O.2119 (E) dated 26th June 2020.

The Investment of the enterprise in Plant and Machinery or Equipment as at 31st March
2020 as per Clause 4 of the Notification is _____ (Rupees in Lakhs).

The turnover of the Enterprise for the period ending 31st March 2020 as per Clause 5
of the Notification is _____ (Rupees in Lakhs).

Date:

(Signature) Name-
Membership number-

Seal of Chartered Accountant with UDIN reference

INTEGRITY PACT

Between

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

and

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

Preamble

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

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

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

Section 1- Commitments of the Principal

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

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

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

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

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

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

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

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

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

Section 4 - Compensation for Damages

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

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

Section 5 - Previous Transgression

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

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

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

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

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

Section 8 - Independent External Monitor(s)

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

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

Section 9 - Pact Duration

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

Section 10 - Other Provisions

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

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

For & On behalf of the Bidder/

Contractor

(Office Seal)

(Office Seal)

Place-----

Date-----

Witness:_____

Witness:_____

(Name & Address) _____

(Name & Address) _____

Annexure-X

Restrictions under Rule 144(xi) of General Financial Rules, 2017 amendment dt: 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 falling 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 shareholders 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.



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
 भारत हेवी इलेक्ट्रिकल्स लिमिटेड

**Bharat Heavy Electricals Ltd.,
 (A Government of India undertaking)
 Electronics Division**

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 002- Rev 02

GENERAL COMMERCIAL CONDITIONS FOR CONTRACT

These 'General Commercial Conditions for Contract for Purchase' herein after referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects/ customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bangalore 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
- 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent/acceptance/ award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection/ Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
- 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.

Order of Precedence:

In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI / LOA, Special Conditions of Contract and General Conditions of Contract for commercial conditions; and specific agreement on technical conditions, RFQ/offer and specification for Technical Conditions.

Interpretation:

In the contract, except where the context requires otherwise:

- words indicating one gender include all genders;
- words indicating the singular also include the plural and words indicating the plural also include the singular;

- c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

Applicable Conditions:

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted.
2. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head/ through e-mail within a week from the date of receipt of Purchase Order or such other period as specified/ agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.
The purchase order will be deemed to have been accepted if no communication to the contrary is received within one week (or the time limit as specified/agreed by BHEL) from the date of receipt of the purchase order.
3. **Documentation:** After receipt of Purchase Order, vendor should submit necessary documents (if & as applicable) like drawings specified, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report, O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/ Customer.
At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents / specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.
4. **Penalty:**
 - a. **For delay in documentation:** In the event of delay in submission of complete set of specified documents ((like drawings, bill of materials, datasheets, catalogues, quality plan etc. as called in tender specifications including soft copies wherever applicable) in required sets beyond two(02) weeks (or as agreed/indicated in the SCC/Purchase Order) from the date of receipt of Purchase Order (by email), penalty at 0.5% (half percent) per week or part thereof, limited to a maximum of 5% (five percent) of the basic material value of the Purchase Order will be applicable.

Penalty for delayed documentation if applicable, shall be deducted at the time of first supply payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted. GST as applicable will be recovered along with penalty amount.
 - b. **For delay in delivery:** In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of undelivered portion (basic material cost) will be applicable. Delivery will commence from the date of issue of Manufacturing clearance along with approved document. The date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection.

Penalty for delayed delivery if applicable, shall be deducted at the time of first supply payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted. GST as applicable will be recovered along with penalty amount.

5. Contract variations (Increase or decrease in the scope of supply): BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be the basis for such additional work. Vendor shall not perform additional work before BHEL has issued written instructions/ amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.
6. Inspection: Prior written notice of at least 10 days shall be given along with internal test certificates/COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL-EDN, Bangalore for verification/acceptance for issue of dispatch clearance. BHEL reserves the right for conducting repeat test, if required.
All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.
7. Transit Insurance: Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency (as mentioned in dispatch instructions issued by BHEL) through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.
8. Mode of dispatch:
Indigenous Scope: By road on Door Delivery Consignee Copy attached basis through your approved transporter (unless otherwise indicated in Dispatch Instructions), only on receipt of Despatch Clearance from BHEL.
Imported Scope: By Air/Sea through BHEL approved Freight Forwarder/supplier approved Consolidator respectively as per agreed contractual terms, only on receipt of Dispatch Clearance from BHEL.
9. Changes in Statutory levies:
If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the execution of Contract, which was or will be assessed on the bidder in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be. However, these adjustments would be restricted to direct transactions between BHEL and the bidder /agent of foreign bidder (if applicable). These adjustments shall not be applicable on procurement of raw materials, intermediary components etc. by the bidder /agent.
10. Availing duty/tax exemption benefits by bidder, wherever applicable: BHEL shall issue the required Certificate/s, as per relevant policies of the Govt. of India, to facilitate the bidders to avail any such benefits under the Contract. In case of failure of the bidders to receive the benefits partly or fully from the Govt. of India and/or in case of any delay in receipt of such benefits, BHEL shall neither be liable nor responsible in any manner whatsoever.

11. Taxes against sub-vendor dispatches: All taxes/levies, as applicable in respect of all components, equipments and material to be despatched directly from the sub-vendor's works to Site irrespective of the fact whether such taxes and levies are assessable and chargeable on Vendor or the BHEL, shall be to the vendor's account and no separate claim in this regard will be entertained by BHEL.
12. High Sea Sales (HSS): Customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.
Any delay in submission of complete/correct HSS documents to BHEL may incur demurrage charges. All demurrage charges on account of incomplete /incorrect HSS documents submission by vendor will be to vendor's account and all such charges will be recovered from any of the available vendor bills with BHEL.
13. Packaging and dispatch: The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea/ Air / Rail/ Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures/ hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.
The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw/ solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitary/ Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment.
Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (LxBxH) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated in the packing list.
Separate packing & identification of items should be as follows.
1. Main Scope - All items must be tagged with part no. & item description.
2. Commissioning accessories/spares - All items must be tagged with part no. & item description.
3. Mandatory spares - All items must be tagged with part no. & item description.
Nevertheless, vendor shall adhere to dispatch & packing instructions issued by BHEL at the time of dispatch.
14. Assignment of Rights & Obligations; Subcontracting: Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.
15. Progress report: Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.
16. Non-disclosure and Information Obligations: Vendor shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal any specified confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.
17. Cancellation /Termination of contract: BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.
BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so on account of any decline, diminution, curtailment or stoppage of the business.

18. Risk Purchase Clause: In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services not supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.

In case of items demanding services at site like erection and commissioning, vendor should send his servicemen/representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase/service including additional handling charges due to the change.

19. Shortages: In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages, caused by supplier's act or omission, shall be made good at free of cost within a reasonable time that BHEL may allow from such intimation.

Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, supplier shall make good of all such damages within a reasonable time from such intimation by BHEL. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed to supplier.

20. Remedial work: Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.

21. Indemnity Clause: Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment.

22. Product Information, Drawings and Documents: All specified drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract.

Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.

All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the Contract shall continue to be the property of the disclosing party.

23. Intellectual Property Rights, Licenses: If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods/related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged)

claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

24. Force Majeure: Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance.

A party affected by an event of force majeure which may include fire, tempest, floods, earthquake, riot, war, damage by aircraft etc., shall give the other party written notice, with full details as soon as possible and in any event not later than seven (7) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

25. Warranty:

Wherever required, and so provided in the specifications/ Purchaser Order, the Seller shall ensure that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance.

Unless otherwise specified in SCC, warranty period shall be applicable for a period of 24 months from the date of delivery of goods or 18 months from the date of commissioning of goods, whichever is earlier.

The warranty period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable warranty period.

26. Limitation of Liability: Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.

The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

27. Liability during warranty: Vendor shall arrange replacement / repair of all the defective materials / services under its obligation during the warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor. In case, defects attributable to vendor are detected during Warranty period or where the commissioning call is issued within the warranty period, vendor shall be responsible for replacement/ repair of the goods as required by BHEL at vendor's cost even after expiry of warranty period.

Further if the equipment or any part thereof cannot be used by reason of such defect and/or making good of such defect, the warranty period of the equipment or such part, as the case may be, shall be extended by a period equal to the period during which the equipment or such part cannot be used by BHEL because of any of the aforesaid reasons. Upon correction of the defects in the facilities or any part thereof by repair/replacement, such repair/replacement shall have the warranty period for a period of twelve (12) months from the time such replacement/repair of the equipment or any part thereof has been completed.

28. Liability after warranty period: At the end of the warranty, the Vendor's liability ceases except for latent defects. For the purpose of this clause, latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the warranty Period, but later. The Contractor's liability for latent defects warranty for the equipment including spares shall be limited to a period of six months from the end of the warranty period of the respective equipment including spares or first time commissioning, whichever is later but not later than one (01) year from the date of expiry of warranty period.

29. Compliance with Laws: Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.
30. Settlement of Disputes: Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).
31. Arbitration Clause in case of Contract with vendors other than Public Sector Enterprise (PSE) or a Government Department:

Arbitration & Conciliation:

The parties shall attempt to settle any disputes 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, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL–EDN. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.

The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) 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 Bangalore.

The cost of arbitration shall be borne as decided by the Arbitrator upon him entering the reference.

Subject to the Arbitration Clause as above, the Courts at Bangalore alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

Arbitration Clause in case of Contract with a Public Sector Enterprise (PSE) or a Government Department:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred by either party for Arbitration to the Sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any Party aggrieved by such Award may make further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the Parties hereto finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.'

32. Applicable Laws and Jurisdiction of Courts: Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in Bangalore alone shall have jurisdiction to consider over any matters touching upon this contract.
33. General Terms: That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.

That the headings used in this agreement are for convenience of reference only.

That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.



ಭಾರತ್ ಹವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

Page 1 of 5

CE: PR: 003- Rev 02

PB 2606 , Mysore Road Bangalore , 560026 INDIA

SPECIAL COMMERCIAL CONDITIONS OF CONTRACT

Reference is brought to BHEL's Instructions to Bidders (Document Ref: CE: PR: 001- Rev 03) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 02).

These two documents along with Special Conditions of Contract annexed to this RFQ will form an integral part of the contract as and when the RFQ culminates into a Purchase Order / Contract.

RFQ No. : PRV0000038

RFQ Date : }
As per NIT @ <https://eprocurebhel.co.in> website

RFQ Due Date : }

Customer/Project : M/s MAHAGENCO/Bhusawal (1X660 MW) TPP

Scope Description : VIBRATION MONITORING SYSTEM (VMS) & ROTATING MACHINECONDITION MONITORING SYSTEM (RMCMS)

Kindly submit your quotation as ~~single/two~~/**three-part bid** (PQR-1ST Bid, Techno-Commercial bid-2nd part & Price bid-3rd Part) in E-Procurement System portal: <https://eprocurebhel.co.in> within the Due- Date as per NIT before 13.00 hours IST and note that tenders will be opened on the same day at 13.30 hours IST.

Purchase Executives: Clarifications with regard to the tender shall be addressed to purchase officers whose e-mail IDs are given below:

praviirajp@bhel.in or saravanababu@bhel.in

Splitting of tendered quantity to MSE vendors: ~~The tendered quantity will be split to MSE vendor/s subject to submission of relevant document/s by vendors. Refer clause-I of Instructions to Bidders for conditions applicable and for information on document/s to be submitted.~~

Destination: For Indigenous scope of supply, items are to be directly despatched to BHEL site office/stores located at Bhusawal TPS project site in Maharashtra state, India. Detailed Consignee details will be issued by BHEL along with Despatch Clearance.

Terms of Delivery:

- **Indigenous scope of supply:** Ex-works, <indicate station of dispatch> (including Packing & Forwarding charges but excluding Taxes).
- **Imported scope of supply:** F.C.A. (for air consignments) ~~< indicate international port of dispatch >~~ / C.I.F. (for sea consignments) ~~< ICD, Bangalore >~~ (including Packing, Forwarding, Handling, Ancillary charges like processing of Sight Draft/ Letter of Credit, negotiation of bank documents, Export declaration, Country of Origin etc.).

Kindly indicate the approximate weight of the total imported consignment, which is required for calculating air-freight/Inland freight charges: _____

Under-mentioned details shall be provided against indigenous supplies & services:

- a. GSTIN of place of supply : _____
- b. HSN (Harmonized System of Nomenclature) code : _____
Applicable tax and Rate : _____ & _____
- c. GSTIN of place of supply of service :
- d. SAC (Service Accounting Code) : _____
Applicable tax and Rate : _____ & _____
- e. GeM Seller ID mandatorily required for PO placement: _____

I. Bidders to mandatorily provide confirmation/compliance for the under-mentioned terms:

SL N O.	TERMS	BHEL ACCEPTABLE TERM	BIDDER'S CONFIRMATION	REMARKS, if any
01	Reverse Auction (RA)	BHEL shall be resorting to Reverse Auction (Guidelines as available on http://www.bhel.com/index.php/vender) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.	AGREE	
02	Parting of license for imported raw materials	In case of projects where Basic Custom Duty is NIL and vendor is importing any raw materials / components for the enquired item, same are eligible for Zero Customs duty. As per EXIM policy, BHEL will part the import licence with the vendors to obtain import licence by themselves and custom clear the raw materials/ components by availing zero customs duty. Hence, please furnish list of raw materials / components to be imported by you with Quantity and CIF value (for which BHEL has to share import licence). The benefit due to the above shall	AGREE CIF value Yes, benefit passed-on to BHEL in the priced quotation. (or) We confirm that there are no imported	

		<p>be passed on to BHEL and confirmed in the quotation.</p> <p>If there are no imported raw materials/ components, same shall be confirmed in the offer.</p>	components	
03	Delivery Period	<p>Within 16 weeks from the date of issue of Manufacturing clearance along with approved document.</p> <p>Delay in contractual delivery will attract Penalty as per GCC Clause no.:04.b.</p> <p>Manufacturing clearance for spares will be provide later as per site delivery schedule of spares.</p> <p>Delivery schedule of spares : September 2022</p>	<p>AGREE</p> <p>.....weeks</p>	
04	Terms of Payment at the time of material supply	<p>Refer Clause “F” of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms:</p> <p>Indigenous Scope: Supply with Service(s) – (a)</p> <p>High-Sea Sales: Supply with Service(s) – (e)</p> <p>Mandatory Spares: Supply Only – (b) & (f)</p>	AGREE	
05	Declaration of local content: The ‘Class-I local supplier’/‘Class-II local supplier’ shall be required to indicate percentage of local content and provide self-certification that the item offered meets the	<p>‘Local content’ means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.</p> <p>{‘Class-I local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under Public procurement order no.P-45021/2/2017-PP (BE-II) dt: 16.09.2020.</p> <p>‘Class II local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, has local</p>	<p>Percentage of local content: _____ %</p> <p>Details of the Location(s) at which the local value addition is made : _____</p>	

	local content requirement for 'Class-I local supplier'/' Class-II local supplier ', as the case may be.	<p>content more than 20% but less than 50%, as defined under Public procurement order no.P 45021/2/2017 PP (BE II) dt: 16.09.2020.</p> <p>In the event of any Nodal Ministry prescribing higher or lower margin of purchase preference and/or higher or lower percentage of local content in respect of this procurement, same shall be applicable;.’</p> <p>(Refer Clause ‘A’ Sl. No. 12 of Instructions to Bidders).</p> <p>Non-Local Suppliers are also eligible to participate in the tender.</p>		
06	Declaration as a compliance to Rule 144(xi) of GFR, 2017 amendment dt 23.07.2020 issued by Ministry of Finance, Govt. of India.	<p>The below declaration is to be submitted on Company Letter head duly signed and sealed by authorised signatory, for ascertaining the eligibility of offer in the tender.</p> <p>“I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that our firm is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that our firm fulfils all requirements in this regard and is eligible to be considered.”</p> <p>(Refer Clause ‘A’ Sl. No. 13 of Instructions to Bidders).</p>		

II. Bidder to note that Deviations shall not be permitted for the below mentioned terms and are deemed to be complied. In case of non-compliance/deviation, offer shall be liable for rejection:

- (1) **Submission of documents post PO viz., drawings / data sheet etc. as indicated in Cl: 04 of GCC:** Within _02_ weeks from the date of receipt of Purchase Order. Delay in submission of complete set of specified documents in NIT, will attract Penalty as per GCC Clause no.04.a.
- (2) **Validity:** The offer will be valid for a period of _90_ days from the date of Part-I bid opening and in case of Negotiation/ Counter-offer, price validity will apply afresh for a period of _30_ days from the date of according final price by bidder (or) up to original validity period, whichever is later.
- (3) **Warranty:** _24_ months from the date of dispatch of goods (or) _18_ months from the date of commissioning, whichever is earlier.
- (4) **Performance Bank Guarantee (PBG):** PBG will be applicable for a period of _24_ months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10% of the basic value of purchase order. It shall however be noted that PBG is not applicable against supply of Mandatory Spares.

Refer Clause “H” of Instructions to Bidders. Also note that PBG should be in the format specified in Annexure VII of ITB and no deviation to this format will be allowed.

Note: In case PBG is not furnished, the 10% basic amount will be withheld from the supply invoice. This withheld amount will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.

- (5) **Despatch Documents:** Complete set of despatch documents (original + 1 photocopy set) as per Purchase Order shall be forwarded to Purchase Executive/BHEL directly. Despatch documents shall include the following:

Invoice (01 original and 01 copy with original sign & seal / digitally signed invoice), Lorry Receipt (L/R), Packing List, NIL Short-Shipment Certificate, insurance intimation letter, E-way bill, original Performance Bank Guarantee (directly from issuing bank to BHEL) and original POD (Proof of Delivery) on L/R.

One set of Invoice, Packing List, Lorry Receipt & E-way bill shall be e-mailed immediately to BHEL-EDN at the time of despatch.

Note: Detailed Packing List should indicate package-wise content details and also Net & Gross weight of each package.

- (6) **Freight Charges (for indigenous scope of supply):** Freight charges shall be to vendor's account. Bidder to quote Lump sum reasonable Freight charges along with applicable tax, in price bid for both main supply and mandatory spares separately.

- (7) **Evaluation criteria to determine L1 bidder:**

(a) ~~Item-wise evaluation of tendered item.~~

(or)

(b) Items will not be split on item-wise lowest offer. Evaluation of the lowest bidder will be done as a combined package basis.

- (8) **Erection and Commissioning charges:**

In case the quoted total Erection & Commissioning value is less than 10% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards Erection & Commissioning charges.

Refer Sl. no. ‘g’ under Clause ‘F’ of Instructions to Bidders for Payment terms of Erection & Commissioning charges.

With this, we hereby confirm that all the terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 03) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 02) are accepted without any deviation.

Vendor’s Signature with
Seal



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REF. : CE / 416 / VMS / OT-VI

REV. NO. : 00

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**PURCHASE SPECIFICATION FOR
VIBRATION MONITORING SYSTEM (VMS)
&
ROTATING MACHINE CONDITION
MONITORING SYSTEM (RMCMS)

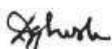
FOR
MAHAGENCO – BHUSAVAL 1×660 MW
UNIT # 6 STPP**

REVISION : 00

APPROVED BY


Ashish M

PREPARED BY


D. GHOSH

ISSUED

416

DATE

18/05/2021



**Purchase Specification for
Vibration Monitoring System (VMS) and
Rotating Machine Condition Monitoring System
(RMCMS)**

REF.: CE / 416 / VMS / OT-VI
REV. NO.: 00
PAGE: 02 of 02

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B	PRE-QUALIFICATION REQUIREMENTS	CE/416/RMCMS/BHUSAWAL/PQ
C	SPECIFICATION FOR VIBRATION MONITORINGS SYSTEM (VMS) & ROTATING MACHINE CONDITION MONITORING SYSTEM (RMCMS)	CE/416/RMCMS/BHUSAWAL/PS
D	PACKING SPECIFICATION Enclosure: CE/409-416/TSS-VMS/PKG	CE/416/RMCMS/BHUSAWAL/PG



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SECTION – A

REF. : CE/416/RMCMS/BHUSAWAL/GI

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GENERAL INSTRUCTIONS TO BIDDERS

REVISION : 00

APPROVED

Ashish M

PREPARED

ISSUED

DATE

D GHOSH

416

18/05/2021



**Purchase Specification for
Vibration Monitoring System (VMS) and
Rotating Machine Condition Monitoring System
(RMCMS)**

REF.: CE/416/RMCMS/BHUSAWAL/GI
REV. NO.: 00
PAGE: 2 of 2

GENERAL INSTRUCTIONS TO BIDDERS:

- 1.0 ALL REQUIRED DOCUMENTS AGAINST THIS TENDER / SPECIFICATION SHALL BE SUBMITTED IN ENGLISH ONLY.
- 2.0 Introduction: Bidders are required to offer Vibration Monitoring System (VMS) and Rotating Machine Condition Monitoring System (RMCMS) for certain critical Pumps, Fans, Compressors, Crushers & Motors and Vibration Analysis System for Steam Turbine Generator & Boiler Feed Pump Drive Turbines, for Super-critical Thermal Power Plant.
- 3.0 Bidders shall fill-up the attached Proforma of Vendor Approval along with Annex B separately for VMS and RMCMS, and shall submit the details in editable soft-copy along with the necessary supporting documents along with their PQR Offer.
- 4.0 Pre-qualification requirements (PQR) are mentioned in Section-B of this Specification. Bidder to read the same carefully and submit the details required for BHEL's acceptance. In case Bidder does not include the details or meet the requirements of Pre-qualification requirements, their offer will be summarily Rejected and Bidder's Technical offers will not be Evaluated.
- 5.0 Bidders to submit their Technical offer / proposal as per Section-C of this Specification. Bidders to note that make and model nos. of RMCMS including sensors, monitors racks etc. shall be same for of all equipment mentioned in this specification.
- 6.0 Bidders need to offer all components / accessories required to meet the intent of the specification. If it is found, at any stage of procurement / commissioning, that some components / accessories have not been offered / supplied, same shall be supplied without any cost / time implication to BHEL to meet the system / product requirement.
- 7.0 Any change in scope / specification, deviations (if any) arises during technical evaluation of offers, the same will be communicated only to the participating bidders for this tender.
- 8.0 The detailed guidelines for packaging is provided in Section-D of this Specification.
- 9.0 Evaluation methodology:

BHEL shall initially open Bidder's PQR documents only, as per Section-B of this specification, for review & acceptance.

BHEL shall submit to customer, the filled-up Proforma of Vendor Approval for the vendors who fulfills the PQR clauses 1.0, 2.0 and 3.0; and shall await customer's decision on vendor approval for a maximum of one month from the date of bid opening. If vendor approval is not received within the above period, BHEL shall treat the offer as "NOT Meeting PQ Criteria" and the offer shall be rejected.

Only after acceptance of PQR documents, BHEL shall open Bidder's technical offers for evaluation.

Commercial bids of only accepted and approved Bidders by End users/Customers, shall be considered by BHEL for further processing.



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SECTION – B

REF. : CE/416/RMCMS/BHUSAWAL/PQ

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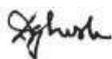
PRE-QUALIFICATION REQUIREMENTS

REVISION : 00

APPROVED


Ashish M

PREPARED


D GHOSH

ISSUED

416

DATE

18/05/2021



**Purchase Specification for
Vibration Monitoring System (VMS) and
Rotating Machine Condition Monitoring System
(RMCMS)**

REF.: CE/416/RMCMS/BHUSAWAL/PQ
REV. NO.: 00
PAGE: 2 of 2

Pre-Qualification Requirements (PQR) of Bidders for VMS & RMCMS, as a part of Offer :

Note: All documents shall be compiled clause wise and submitted with proper tagging / cross-references in the following order.

1.0 Submit Reference List of Projects wherein offered system is supplied & commissioned, along with details of machines & similar measurements and Year of Commissioning of the system. Reference list shall contain name of end user, latest contact email ID and contact telephone number.

2.0 Provenness Criteria:

- i. Bidder shall offer suitable make and model whose guaranteed and trouble-free performance has been proven at least for two (2) years in not less than two (2) different reheat type pulverized coal fired units of unit size not less than 500 MW, for similar machine ratings and applications.
- ii. In support of the above stated provenness requirement for the offered make and model, the bidder shall submit the following supporting documents:
 - Purchase order (un-priced)
 - Datasheet of sensor, monitor & software (extract from approved technical document)
 - Commissioning report (signed copy)
 - Performance report (for minimum 2 years of satisfactory continuous operation) for the offered system from End-user.

3.0 Bidders who are making offer for this tender shall have authorized representative in India for support related to documentation, erection, commissioning, trouble-shooting, after-sales services, spares & any other co-ordination work for the offered system.

Bidder to submit following documents in support of the same:

- OEM's Authorization letter to the Indian agency
- Registered address of Indian office / Pre-shipment Inspection facility details
- Organization chart of Indian agency with list of design engineers & service engineers
- List of projects for which E&C activities have been carried-out by the Indian agency, along with signed commissioning protocol from end-user/s.

4.0 BHEL shall submit to customer the filled-up Proforma of Vendor Approval as per attached format along with credentials & financial details as furnished by the bidder; and shall await customer's decision on vendor approval for a maximum of one month from the date of bid opening. If vendor approval is not received within the above period, BHEL shall treat the offer as "NOT Meeting PQ Criteria" and the offer shall be rejected.

Important Note: In case the bidder does not submit details mentioned in the above clauses or meet the requirements of Pre-qualification requirements, Offers will be summarily Rejected and bidder's Technical offers/ proposals will not be evaluated. Please read carefully the General instructions in Section-A of this specifications.



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SECTION – C

REF. : CE/416/RMCMS/BHUSAWAL/PS

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SPECIFICATION FOR VIBRATION MONITORING SYSTEM (VMS) AND ROTATING MACHINE CONDITION MONITORING SYSTEM (RMCMS)

REVISION : 00

APPROVED

Ashish M

PREPARED

ISSUED

DATE

D. GHOSH

416

18/05/2021



**Purchase Specification for
Vibration Monitoring System (VMS) and
Rotating Machine Condition Monitoring System
(RMCMS)**

REF.: CE/416/RMCMS/BHUSAWAL/PS
REV. NO.: 00
PAGE: 2 of 19

AA Project Synopsis: MAHAGENCO – Bhusawal (1x660 MW) Unit # 6 STPP

Plant is located in Dipnagar near Bhusawal, Maharashtra, India. Dipnagar is well connected by rail & road. The site is located on the Mumbai-Nagpur Highway. By road, it is about 8 Km from Bhusawal city. The nearest railway station is at Bhusawal. The nearest Airport is at Aurangabad. The nearest Seaport is at Mumbai.

BB Product Description:

Vibration Monitoring System (VMS) and Rotating Machine Condition Monitoring System (RMCMS) shall acquire data related to the mechanical health of rotating equipment, perform analysis in a proven software platform and display vibration and other machine data for Turbine, Generator & Exciter, BFP Drive Turbine, Pumps, Fans, Compressors and HT Motors; the machine details are provided later in this specification.

System shall be proven and from latest product range of the manufacturer.

There shall be hardwired data exchange from RMCMS to DCS for display, trending, alarming and interlocking / protection. Similarly there shall also exchange of process data from DCS to RMCMS for analysis.

The system shall have the following sub systems:

- a) Field Transducers
- b) Data acquisition, condition management and display
- c) On line Machinery Protection and Monitoring
- d) Automated machine diagnostic with decision support system.
- e) Data Interface with DCS

CC Scope of Supply & Services:

Scope of Supply shall include Engineering, Manufacturing & Testing, and Services for sensor installation, fiber optic cable splicing & termination, Supervision of balance Erection activity, Commissioning & Training activities as per this specification for VMS & RMCMS for the machines listed in Machine Data Section – A (A1, A2, A3 & A4) and B (B1 & B2) under Technical Requirement clause DD.

The RMCMS shall take raw buffered vibration signals from the third party Turbine Supervisory System/s (TSS) for STG & BFPDT, to provide a unified **Condition Monitoring System**, specified in clause DD 26 of Technical Requirement of this specification. Details of raw buffered vibration signals of STG & BFPDT is listed in Machine Data Section – B (B1 & B2) under Technical Requirement clause DD.

Note: Scope of supply does not include TSS for STG and TSS for BFPDT.

DD Technical Requirement:

1. The system shall be offered complete with sensors, proximitors, mounting pads, local junction boxes, sensor extension cable, monitors, relay modules, networking hardware, machinery condition management server, redundant (dual) power supplies, special cables, licensed software, calibration equipment etc.
 2. Cables between monitoring panels (TB) and junction boxes, between monitoring panels (TB) and DDCMIS will be provided by BHEL. The field instrumentation cable from local junction boxes to monitoring panels (TB) will be provided by BHEL, which is 4 & 6 Pairs x 0.5Sq.mm – PVC, FRLS, Individual & Overall shielded Pair Copper Cable, armoured, suitable for X & Y direction sensors per bearing. 2 Triad x 0.75Sq.mm Individual & Overall shielded Pair Copper Cable, armoured, will be provided by BHEL for Proximity / Shaft Vibration / Phase measurement / Axial shift sensors.
 3. In all cases vibration shall be measured in both X-Y direction along with key phasor for phase reference. The vibration sensor's sensitivity shall be within $\pm 5\%$ tolerance.
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4. The system shall have feature to bypass a relay contact in the event of sensors/ proximator failure.
 5. In all cases power supply modules shall be redundant (dual). BHEL will provide redundant incoming power feeders through redundant 240 V AC, 50 Hz UPS system in the respective control rooms.
 6. Contact of alarm & trip relays shall be hardwired up to panel terminals. Analog output per channel shall be hardwired up to panel terminals.
 7. Trip channel for each machine shall be configured in separate modules to avoid single failure.
 8. Analog output per channel shall be in the form of isolated 4-20 mA DC and contact output shall be potential free.
 9. Transducer data Interface and the machine monitoring & protection subsystem shall be a complete programmable on-line real-time system. It shall be capable of collecting data from machine transducers and from other external devices and shall provide it to Condition Monitoring System to assess machine condition.
 10. The system shall comprise of standard instrument rack mounted in panel, dual power supply modules, monitoring modules, relay modules, interface modules, communication modules and required software.
 11. Communication module shall be connected to external machine condition monitoring server for configuration of monitor modules, relay modules and to monitor static & dynamic data. Data shall be transferred with high integrity and without any loss of data.
 12. Hard key shall be provided to prevent unauthorized access to the system configuration.
 13. Sequence of event and machine data shall be archived in the system for long term storage.
 14. Communication processor shall be capable of collecting data better than once per second.
 15. System shall be time synchronized with the GPS clock in IRIG-B or SNTP protocol.
 16. Removal & replacement of module shall be possible to carry out in system power on condition.
 17. It shall be possible to test all the monitors in the rack. The trip and alarm relay shall be automatically bypassed during testing to prevent alarm and trip.
 18. 24" LED colour monitors & colour laser printer for system configuration, graphic, local display of data, local alarm, system & machine diagnostic shall be provided.
 19. All racks shall be connected in a network and some of the racks mounted in panel/s, shall be located in remote location in air-conditioned offsite control rooms. Networking shall be made through optic fiber cable & ethernet data highway cable.
 20. System shall be capable of operating from 0 to 50 °C and at 95% noncondensing moisture.
 21. Sensors shall be dust proof & weather proof rated to IP-65 and suitable for work in harsh environment.
 22. Sensors, proximators and monitors shall be fully compliant to API 670 Standard 5th Edition.
 23. Each transducer shall be furnished with flexible conduit and low noise cable. Conduit fittings shall be furnished for connection to transducer. The other end of the flexible conduit will be connected to a suitable junction box.
 - 24. Monitor Racks / Cabinet**
 - 24.1 System mounting racks shall be furnished to house monitor modules, indicating/ display units, power supplies, test and calibration equipment. Grouping of modules in racks shall be equipment wise. Each machine train shall have dedicated monitor modules.
 - 24.2 The front of each mounting rack shall house a monitor test-switch, test condition indicating lamp and power on indication lamp.
 - 24.3 Each vibration monitor and mounting rack shall have nameplate to indicate the main equipment to which the module is catering and the bearing details.
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25. Installed Spare Philosophy:

- 25.1 Hot spare 10% for each type of vibration monitor with I/O modules (installed) shall be provided in each functional group, fully wired up to the marshalling/ termination TBs.
- 25.2 Wired-in "usable" space for 10% modules along with Field Terminal assemblies, PCB/Connectors (if any in the offered system) in each of the system cabinets for mounting electronic modules shall be provided for future use.

26. Specification of Condition Monitoring System:

- 26.1 System shall be knowledge based and guide the maintenance engineer & operator to detect the fault and to take corrective action. System shall have the software for Configuration, Data Acquisition, Open Database like SQL and display builder etc.
 - 26.2 Machine Condition Monitoring Server shall be capable of running several software on single platform and interfacing with multiple machinery protection racks using Ethernet communication link. Configuration and downloading of programs for different modules shall be executable from this server with at least two levels password protection.
 - 26.3 The system shall be provided with Client Server, which shall be specifically used for STG and BFPDT analysis & expert system applications; data of all other machines shall also be accessible.
 - 26.4 The system shall generate easy to use custom rules. The system shall be developed with automated advisory capability of the system. Rule generator shall reject any rule, which is not syntactically correct.
 - 26.5 Bidder shall supply licensed version of all the applicable software in run & edit mode for the system and for integration of his system with third party device.
 - 26.6 Features provided in the system shall not be limited to the following:
 - a) Bar graph and point display indicating the set-points.
 - b) Graphical plant and machine area presentation with location of sensors and their current value.
 - c) Diagnostic of the system and machine data.
 - d) Current and history trend.
 - e) Spectral band and waveform plotting.
 - f) Multiple trends display including process value for data correlation.
 - g) Orbit and time base plotting.
 - h) Shaft centerline plot indicating position of a machine rotor.
 - i) Bode and polar plot.
 - j) Automatic auditing of the equipment health upon alarm / periodical / on request. The audit shall guide the operator regarding location of fault, type of fault, severity of the fault, time of occurrence and recommended actions. As a minimum, malfunctions like Shaft bow, high vibration, rotor rubbing, high run-out, loose rotating parts etc. shall be provided. The system shall have the facility to take a backup of the malfunction for future use.
 - k) Date & Time stamped alarm list.
 - l) Log & Report generation.
 - m) Provision for beeping icon in case of appearance of alarm.
 - n) Duplex redundant communication link shall be provided.
 - o) Electronic documentation.
 - 26.7 The computer based analysis system with decision support shall be provided to achieve the following functions:
 - a) On-line Spectrum / Harmonic analysis.
 - b) Identification of exact nature of failure resulting in increase in bearing vibration and direct message on the monitor indicating the exact nature of fault e.g. misalignment, crack, bearing looseness, rotor rub, vector change etc.
 - c) Storage and comparative analysis of vibrations with decision support.
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- d) Generation / analysis of Bode plot/ Orbit plot and Time waveform / Nyquist plot, Transient data (during start-up and shut down).
 - e) Storage and comparative analysis of vibrations.
 - f) Computer based analysis system shall be common for STG, BFPDT and all other drives (in Sec-A).
- 26.8 The system shall be adequate for providing necessary information for balancing various sections of the turbine-generator.

27. Specification of Cabinet / Panel:

Vendor shall supply the panel for VMS & RMCMS (Electronic Modules) as per below specification:

- 27.1 Panel shall be of size 800 mm X 800 mm X 2065 mm H (including Bottom frame 50 mm + Antivibration pad 15mm). Panel internal height shall be 2000 mm.
- 27.2 Panel shall be made up of 2mm thick CRCA steel sheet.
- 27.3 Anti-vibration pad of about 15 mm shall be provided.
- 27.4 Panel protection class shall be IP – 42.
- 27.5 Door shall be provided in the front & rear sides, shall be of 2 mm thick CRCA steel sheet.
- 27.6 3 point locking system
- 27.7 Glass window / partition shall be provided in the panel for viewing purpose.
- 27.8 Paint shade/s shall be : Stoving Epoxy based Powder Coated
 - i) Exterior – Pebble Grey RAL: 7032 (Semi Glossy)
 - ii) Interior – Brilliant White (Glossy Finish)
- 27.9 Panel painting shall be powder coated 100 microns thick or more.
- 27.10 Cutout with cable-gland plates 3mm thick, shall be provided on the bottom of the Panel, for Cabling.
- 27.11 Suitable Lifting Hooks shall be provided on the Panel.
- 27.12 Provision shall be made in the Panel to accept two power supply feeders with required MCB's.
- 27.13 Terminals shall be Clip-on type for cable termination. 20 % spare terminals shall be offered.
- 27.14 Louvers with removable mesh shall be provided for ventilation.
- 27.15 M8 Stud shall be provided for cubicle earthing connection on left & right hand ends.
- 27.16 Document pocket shall be provided in both front and rear door.
- 27.17 LED lamp illumination shall be provided in the panel with door limit switch.
- 27.18 Provision for mounting smoke detector shall be provided.
- 27.19 Cable glands double compression type shall be provided, as required quantity.

Note: Vendor to offer separate Panel Sets for each offsite plant control rooms.

28. Specification of Junction Box (JB) / Master Junction Box (MJB):

Field Junction box with Terminals, as per below specification:

- 28.1 Type of Enclosure: Dust tight & weatherproof confirming to IP-65.
- 28.2 Material: 3 mm sheet steel.
- 28.3 Type of cover: Solid unhinged with retention chain
- 28.4 Paint: External: RAL 7032 and Internal: Brilliant White
- 28.5 Mounting: Surface
- 28.6 Cable Entry: 3 mm (min) Gland plate
- 28.7 Gasket: Neoprene
- 28.8 Grounding: Brass earth lug with green screw head; External – 2 nos., Internal – 1 No M6
- 28.9 No. of Drain Holes: Two at bottom capped
- 28.10 Identification: Level for JB and Tags for cable
- 28.11 Accessories:
 - a) Rail mounted Cage Clamp type screw less terminals with markers + 20% spare.
 - b) Cable gland
 - c) Canopy at top
 - d) Mounting brackets along with bolts, nuts made of brass etc.
 - e) Ferrules

Note: Vendor to offer VMS JB's separate for each machine (eg. separate JB/s for pump / fan & motor).



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29. Specification for Cable Glands

- 29.1 Type: Double compression
- 29.2 Entry Thread: NPT
- 29.3 Material: Brass
- 29.4 Finish: Cadmium Plated
- 29.5 Protection: IP – 54 or better
- 29.6 Accessories: Neoprene gasket, locknuts, reducers etc.

30. Special Tools & Tackle

- 30.1 One set of Portable data collector shall be provided for taking periodic collection of non-critical machine data. Machine condition monitoring system shall be capable to analyze the data. Instrument shall be microprocessor based and ready for use in harsh environment. Integral LCD display shall provide the necessary display of readings & spectral data. Minimum 02 channels along with additional input for phase reference measurement shall be available with the instrument.
- 30.2 Instrument shall include necessary accelerometers and other devices with accessories for collection of machine parameters. A long life Ni-Cd battery pack shall be used. Replacement of battery shall not lead to loss of stored data.
- 30.3 Shaker table shall be provided for testing & calibration.

31. Specification of Server & Client Server:

- 31.1 CPU: 2nd Generation Core i5 or better
- 31.2 Type: Tower
- 31.3 Main Memory: 4 GB or better based on the number of signals
- 31.4 Drive: DVD +/- RW DRIVE (8X minimum)
- 31.5 Hard Disk: 1TB mirroring type or better based on the number of signals
- 31.6 Monitor: 24" Colour LED backlit
- 31.7 Communication Port: 2 serial plus 1 parallel, 2 USB
- 31.8 Expansion Slot: 5
- 31.9 Connectivity: Ethernet LAN
- 31.10 Operating System: Windows XP or higher
- 31.11 Software: Latest version of MS Office, Anti-Virus, Client's Software and other software as required.
- 31.12 Master Slave Card for Time synchronization in IRIG-B or SNTP protocol
- 31.13 Accessories: 101 keys Keyboard and Optical Mouse with mouse pad.

32. Specification of Printer:

- 32.1 Type : Colour Laser jet, tabletop, network ready
- 32.2 Power supply : 240 V, 50 Hz, 1 phase
- 32.3 Size of paper: Letter, A4.
- 32.4 Accessories: Adapters & Connector Cable

33. Requirement of Optical Fiber Cabling:

Optical Fiber redundant bidirectional data highways shall be offered for vibration analysis system. Fibre optic redundant cables shall run in two physically separate conduits optical fiber distribution box, patch cord / pigtail, converter, terminators, taps, heavy duty conduits etc. shall be included in the offer. Vendor to consider both side termination of optical fiber cables.



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Cabling distances between various offsite control room is as below:

- a) CW / ACW Pump House (CWPH) Control Room to Main CER = 830 meters
- b) Fire Water Pumps House (FPPH) to Main CER = 1190 meters
- c) AHP MCC-1 Control Room to CHP MCC-3 Control Room = 850 meter
- d) CHP MCC-3 Control Room to Main CER = 900 meter
- e) AHP MCC-1 Control Room to Main CER = 550 meter
- f) FGD Control Room to Main CER = 725 meter

Vendor shall offer required redundant networking components for Vibration Analysis System.

34. **Indigenous** / Bought-out items shall be from following sub-vendors:

SN	ITEM	SUPPLIER	PLACE
1	BLANK CABINETS / PANEL	PYROTECH	UDAIPUR
		RITTAL	
		INSTRUMENTATION LTD.	KOTA
		KHODAY CONTROL	BANGALORE
		CHEMIN CONTROLS	PONDICHERRY
2	METAL JUNCTION BOX	M/S DEVI POLYMERS	CHENNAI
		M/S SUCHITRA INDUSTRIES	BANGALORE
		M/S RITTAL	
		M/S PYROTECH	
		M/S L&T	
		M/S HENSEL ELECTRIC INDIA PVT. LTD.	SRIPERUMBUDUR
3	SERVER	IBM, DELL, HP / COMPAQ	
4	COMPUTER MONITOR	LG, SAMSUNG, HP, COMPAQ, IBM, DELL,	
5	PRINTER	HP, EPSON, CANON, IBM, XEROX, SAMSUNG	



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Section - A

Section – A1: Machine Data for BTG and BOP area machines for Vibration Monitoring System (VMS) and Rotating Machine Condition Monitoring System (RMCMS).

Sl. No.	Machine	Machine Qty.	Installation (Horizontal/Vertical)	Machine RPM	Measuring Parameter	No. of Brg. to be Monitored (X & Y)	Vib. Alarm Level (mm/sec-RMS)	Vib. Trip Level (mm/sec-RMS)	No of Vibration Sensors	No. of Phase Marker
1	Turbine Driven Boiler Feed Pump (TDBFP)	2	Horizontal	800-7000	Relative Shaft Vib.	2	90 μ m ^{P-P}	150 μ m ^{P-P}	8	2
2	Motor Driven Boiler Feed Pump (MDBFP)	2	Horizontal	800-6500	Relative Shaft Vib.	2	90 μ m ^{P-P}	150 μ m ^{P-P}	8	2
3	MDBFP - Motor	2	Horizontal	1500	Brg. Casing Vib.	2	4.5	7.1	8	
4	Cond. Extn. Pump-CEP	3	Vertical	1485	Brg. Casing Vib.	1	6.45	8.6	6	3
5	CEP - Motor	3	Vertical	1500	Brg. Casing Vib.	2	4.5	7.1	12	
6	Boiler Fill Pump	2	Horizontal	1485	Brg. Casing Vib.	2	10.0	15.0	8	2
7	Boiler Fill Pump Motor	2	Horizontal	1500	Brg. Casing Vib.	2	4.5	7.1	8	
8	ID Fan	2	Horizontal	595	Brg. Casing Vib.	1	4.5	9.0	4	2
9	IDF - Motor	2	Horizontal	600	Brg. Casing Vib.	2	4.5	7.1	8	
10	FD Fan	2	Horizontal	1490	Brg. Casing Vib.	1	4.5	9.0	4	2
11	FDF - Motor	2	Horizontal	1500	Brg. Casing Vib.	2	4.5	7.1	8	
12	PA Fan	2	Horizontal	1490	Brg. Casing Vib.	1	4.5	9.0	4	2
13	PAF - Motor	2	Horizontal	1500	Brg. Casing Vib.	2	4.5	7.1	8	
14	Mill Motor	8	Horizontal	1000	Brg. Casing Vib.	2	4.5	7.1	32	8
15	IA Compressor Motor	3	Horizontal	1500	Brg. Casing Vib.	2	4.5	7.1	12	3
16	SA Compressor Motor	3	Horizontal	1500	Brg. Casing Vib.	2	4.5	7.1	12	3
17	CW Pump - CWP #	2	Vertical	269	Brg. Casing Vib.	1	100 μ m ^{P-P}	160 μ m ^{P-P}	4	2
18	CWP - Motor #	2	Vertical	270	Brg. Casing Vib.	2	4.5	7.1	8	
19	ACWP #	2	Vertical	1500	Brg. Casing Vib.	1	7.0	11.0	4	2
20	ACWP Motor #	2	Vertical	1500	Brg. Casing Vib.	2	5	8.5	8	
21	Hydrant Pump [§]	2	Horizontal	1500	Brg. Casing Vib.	2	7.0	11.0	8	2
22	Hydrant Pump Motor [§]	2	Horizontal	1500	Brg. Casing Vib.	2	5	8.5	8	
23	Spray Pump [§]	1	Horizontal	1500	Brg. Casing Vib.	2	7.0	11.0	4	1
24	Spray Pump Motor [§]	1	Horizontal	1500	Brg. Casing Vib.	2	5	8.5	4	
25	Hyd Pump Engine Driven [§]	1	Horizontal	1500	Brg. Casing Vib.	2	7.0	11.0	4	1
26	Spry Pump Engine Driven [§]	1	Horizontal	1500	Brg. Casing Vib.	2	7.0	11.0	4	1
	TOTAL	58							206	38

Note: 1) KKS Tag Nos. for transducers will be provided during detailed Engineering.

2) The vibration monitoring system panels shall be provided at following respective control rooms:

a) CW / ACWP PH Control Room for sl. no. 17, 18, 19 & 20 in the above list.

§ b) Fire Water PH Control Room for sl. no. 21, 22, 23, 24, 25 & 26 in the above list.

c) Main Control Equipment Room (CER) for all other machines not listed in point no. a & b above.

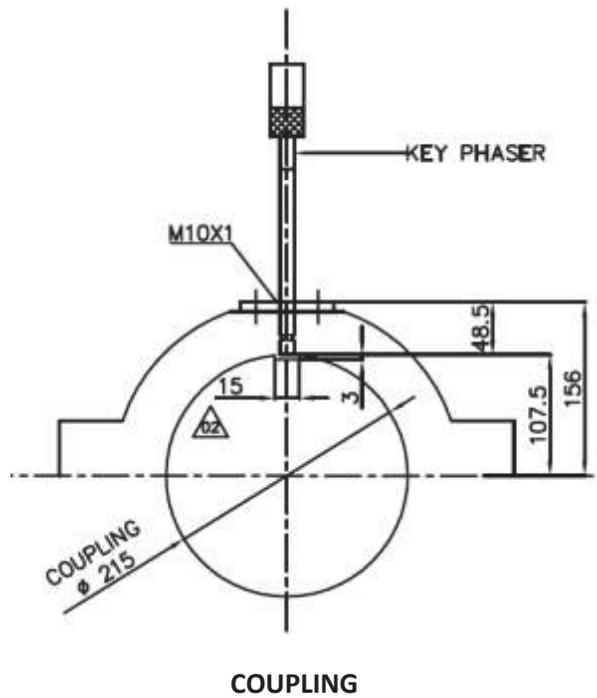
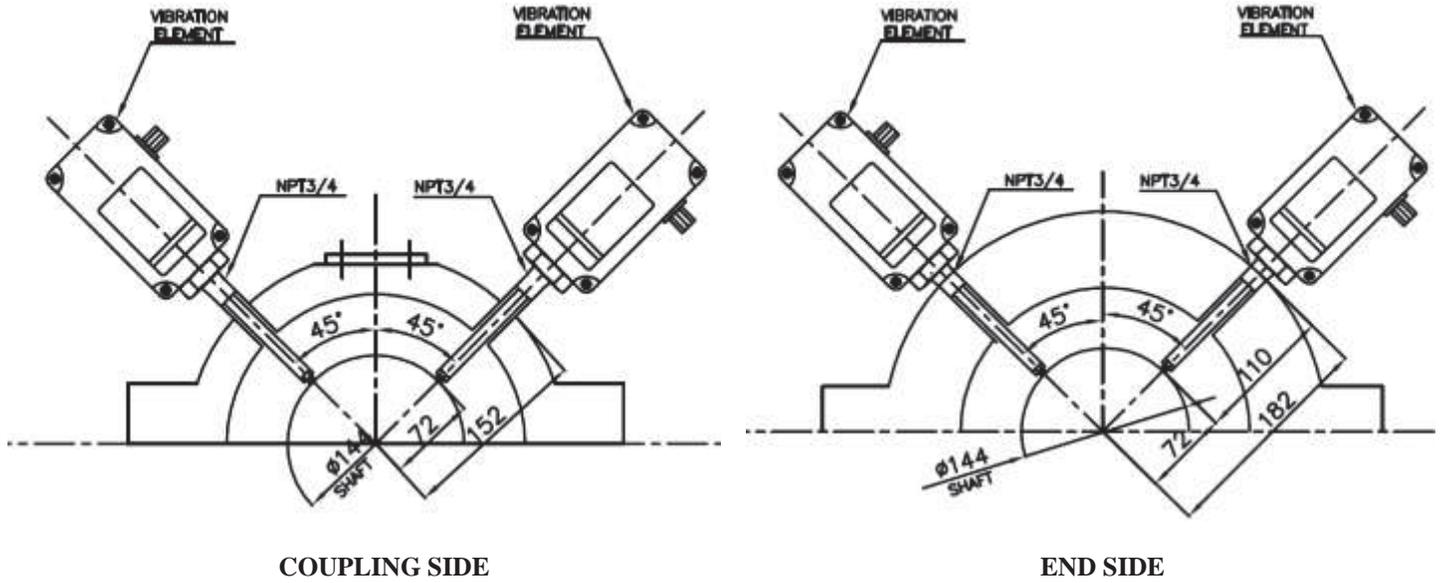
3) Bearing Casing Vibration Sensors shall be provided with **M6x1 Studs** for all machines except Fire Pumps for which **M8x1.25 Studs** shall be provided and for MDBFP Motor for which **M8x1 Studs** shall be provided. Spare mounting studs of sizes M8x1 (20 nos.), size M6x1(100 nos.) and of size M8x1.25 (100 nos.) shall also be provided.

Two position (X & Y) sensor mounting block of dimension 40mm x 40mm x 40mm shall be provided for each bearing.

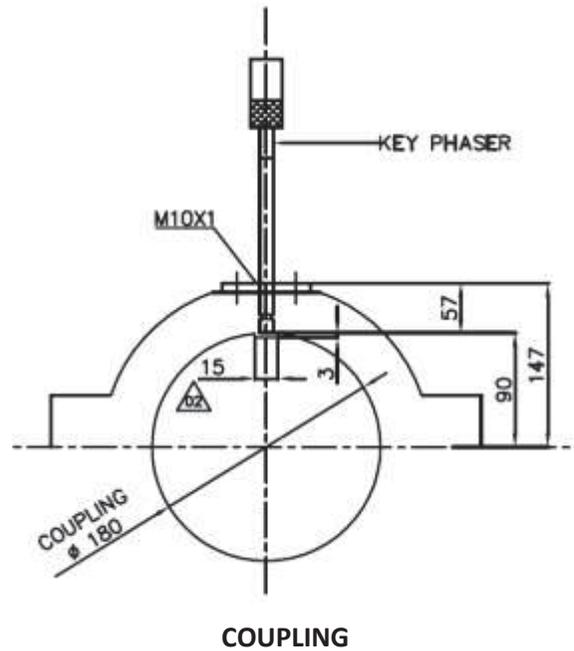
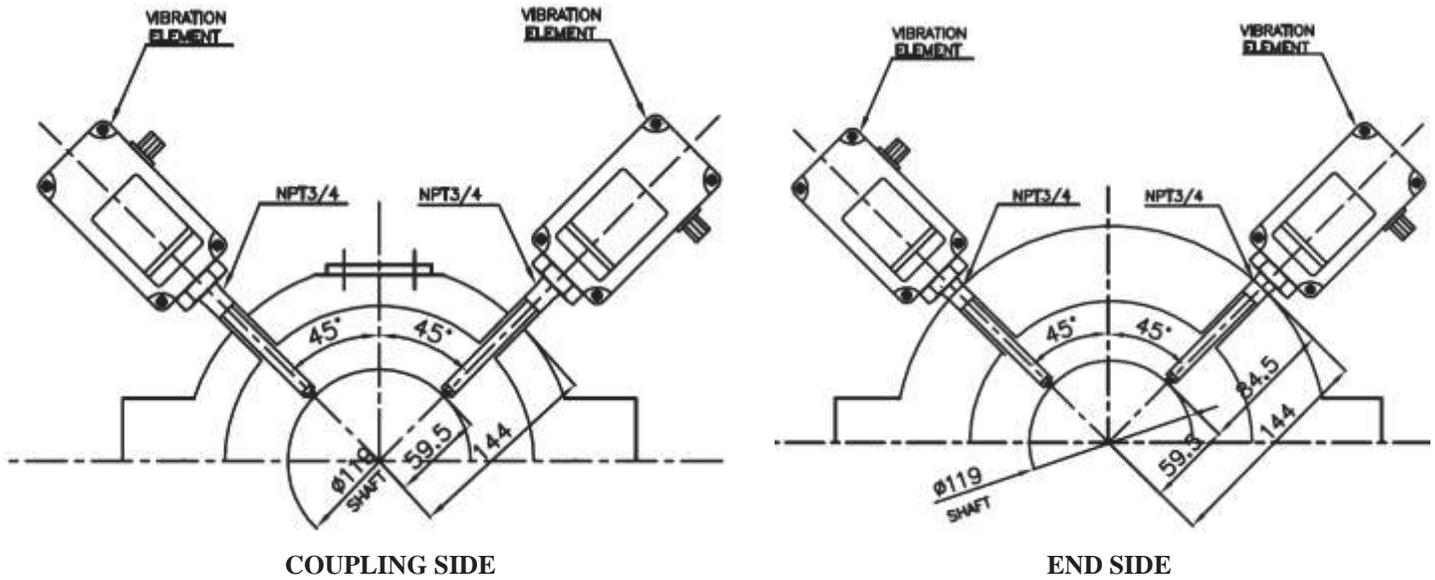
4) Phase Marker Probe mounting provision on the machine: Key-slot on coupling / shaft shall be provided of dimension 30mm L x 15mm W x 3mm D. Vendors to provide suitable brackets for mounting.

5) Sensor mounting provision drawings of TDBFP and MDBFP Pumps are provided in Annexure - 1 & 2 respectively.

Annexure – 1: Sensor mounting arrangement for Turbine Driven Boiler Feed Pump (TDBFP):



Annexure – 2: Sensor mounting arrangement for Motor Driven Boiler Feed Pump (MDBFP):





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Section – A2: Machine Data for Coal Handling Plant (CHP) area machines for Vibration Monitoring System (VMS) and Rotating Machine Condition Monitoring System (RMCMS). Machine/s are in BHEL- ISG's scope of supply.

Machine/s	Motor Rating (KW)	Speed (RPM)	Brg. Type	Bearing Number	No. of M/C	Total No. of Brg. Vibration/ Analysis Points	Total No. of Phase Marker	Nearest RIO	Approx. Cabling dist. from M/C to RIO (in meter)
BCN-2A	360	1485	Anti-friction	DE : 6224C3 NDE: 6220C3	1	4	1	CHP MCC-3	350
BCN-2B	360	1485	Anti-friction	DE : 6224C3 NDE: 6220C3	1	4	1	CHP MCC-3	350
BCN-3A	225	1487	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	CHP MCC-3	150
BCN-3B	225	1487	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	CHP MCC-3	150
BCN-4A	360	1485	Anti-friction	DE : 6224C3 NDE: 6220C3	1	4	1	CHP MCC-3	400
BCN-4B	360	1485	Anti-friction	DE : 6224C3 NDE: 6220C3	1	4	1	CHP MCC-3	400
BCN-5A	360	1485	Anti-friction	DE : 6224C3 NDE: 6220C3	1	4	1	AHP MCC-1	350
BCN-5B	360	1485	Anti-friction	DE : 6224C3 NDE: 6220C3	1	4	1	AHP MCC-1	350
BCN-6A	160	1484	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	AHP MCC-1	500
BCN-6B	160	1484	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	AHP MCC-1	500
BCN-7A	160	1484	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	AHP MCC-1	450
BCN-7B	160	1484	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	AHP MCC-1	450
BCN-8	225	1487	Anti-friction	DE : 6220C3 NDE: 6218C3	1	4	1	CHP MCC-3	150
CRUSHER MOTOR-1	1100	995	Anti-friction	DE: NU232M + 6232C3 NDE:NU228M	1	4	1	CHP MCC-3	150
CRUSHER MOTOR-2	1100	995	Anti-friction	DE:NU232M + 6232C3 NDE:NU228M	1	4	1	CHP MCC-3	150
CRUSHER-1		400	Spherical Rotor Bearing		1	4	1	CHP MCC-3	150
CRUSHER-2		400	Spherical Rotor Bearing		1	4	1	CHP MCC-3	150

Note: 1) KKS Tag Nos. for transducers will be provided during detailed Engineering.

2) The vibration monitoring system panels shall be provided at the nearest RIO as mentioned in the above list.

3) VMS for CHP area drives shall be independent of operation of the VMS for the AHP area drives.

4) **Bearing Vibration Sensor mounting provision on the machines:** Non-removable (40X40x40 mm) pad provided on DE & NDE side along with M8X1.25 tapings. Sensor stud shall be of size **M8x1.25**. Two position (X & Y) sensor mounting block of size 40mm x 40mm x 40mm shall be provided for Crushers.

5) **Phase Marker Probe mounting provision on the machine:** Key-slot on shaft of each machine drive, of dimension 30mm L x15 mm W x 3 mm D. Vendors to provide suitable brackets for mounting.

6) 1 No. **Master Junction Box** (MJB) per machine shall be provided by the vendor. Sensor signal cable up to the MJB shall be provided and terminated by the vendor.



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Section – A3: Machine Data for Ash Handling Plant (AHP) area machines for Vibration Monitoring System (VMS) and Rotating Machine Condition Monitoring System (RMCMS). Machine/s are in BHEL- ISG's scope of supply.

Machine/s	Speed (RPM)	Brg. Type	Bearing Number	No. of M/C	Total No. of Brg. Vibration/ Analysis Points	Total No. of Phase Marker	Nearest RIO	Approx. Cabling dist. from M/C to RIO (in meter)
CONVEYING AIR COMPRESSOR (1 ST STAGE) MOTOR	1488	Anti-friction	DE: NU224-C3 / NDE:6220-C3	4	16	4	AHP MCC-1	100
TRANSPORT AIR COMPRESSOR (2 ND STAGE) MOTOR	1490	Anti-friction	DE: NU224-C3 / NDE:6224-C3	2	8	2	AHP MCC-1	100
ASH SLURRY PUMP	790	Later	Later	10	40	10	AHP MCC-1	215
ASH SLURRY PUMP MOTOR	1482	Anti-friction	Later	10	40	10	AHP MCC-1	215
BAHP WATER PUMP*	1480	Later	Later	2	8	2	AHP MCC-1	215
BAHP WATER PUMP MOTOR	1489	Anti-friction	Later	2	8	2	AHP MCC-1	215
FAHP WATER PUMP*	1480	Later	Later	2	8	2	AHP MCC-1	215
FAHP WATER PUMP MOTOR	1482	Anti-friction	Later	2	8	2	AHP MCC-1	215
HCS D MOTOR	1484	Anti-friction	DE :NU224-C3 + 6224-C3 NDE: NU224-C3	2	8	2	AHP MCC-1	200

Note: 1) KKS Tag Nos. for sensors / signals will be provided during detailed Engineering.

2) The vibration monitoring system panels shall be provided at the nearest RIO as mentioned in the above list.

3) VMS for AHP area drives shall be independent of operation of the VMS for the CHP area drives.

4) **Bearing Vibration Sensor mounting provision on the machines:** Non-removable pad provided with M8X1.25, 13mm deep tapping in all directions on DE & NDE side. Sensor stud shall be of size **M8x1.25**.

5) **Phase Marker Probe mounting provision on the machine:** Key-slot on shaft of each machine drive, of dimension 30mm L x 15mm W x 3mm D. Vendors to provide suitable brackets for mounting.

* 20mm slot length for phase marker probes have been provided for these machines.

6) 1 No. **Master Junction Box** (MJB) per machine shall be provided by the vendor. Sensor signal cable up to the MJB shall be provided and terminated by the vendor.



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Section – A4: Machine Data for Flue Gas Desulfurization Plant (FGD) area machines for Vibration Monitoring System (VMS) and Rotating Machine Condition Monitoring System (RMCMS). Machine/s are in BHEL-Hyderabad's scope of supply.

Sl. No.	Machine	Machine Qty.	Measuring Parameter and Sensor Type	No. of Brg. to be Monitored (X & Y)	No of Vibration Sensors	No. of Phase Marker
1	Recirculation (RC) Pump	4	Bearing Casing Vibration Piezoelectric Sensor	2	16	4
	RC Pump Gearbox		Bearing Casing Vibration Piezoelectric Sensor	1	8	
2	RC Pump Motor	4	Bearing Casing Vibration Piezoelectric Sensor	2	16	
3	Oxidation Air Blower #	2	Relative Shaft Vibration at DE & NDE each in X & Y direction	2	8	2
			Axial Displacement – 1 no. at NDE side	1	2	
			Gearbox Casing Vibration Y axis Acceleration Sensor	2	4	
4	Oxidation Air Blower - Motor	2	Bearing Casing Vibration Piezoelectric Sensor	2	8	2
5	Vacuum Pump	2	Bearing Casing Vibration Piezoelectric Sensor	2	8	2
6	Vacuum Pump Motor	2	Bearing Casing Vibration Piezoelectric Sensor	2	8	
7	Wet Ball Mill Motor	2	Bearing Casing Vibration Piezoelectric Sensor	2	8	2

Note: 1) KKS Tag Nos. for sensors / signals will be provided during detailed Engineering.

2) The vibration monitoring system panels shall be provided at FGD Control Room for the above list.

3) **# Sensors** (Relative Shaft Vibration, Axial Displacement, Casing Vibration and Phase Marker) for the **Oxidation Air Blower** shall be provided by the machine manufacture. Bidders to consider vibration monitoring and RMCMS system for these measurements.

4) **Bearing Vibration Sensor mounting provision on the machines:** Sensor stud shall be of size **M8x1.25** for the RC Pump & Gearbox and **M6x1** for the other machines. Two position (X & Y) sensor mounting block of dimension 40mm x 40mm x 40mm shall be provided for each bearing.

5) **Phase Marker Probe mounting provision on the machine:** Key-slot on coupling / shaft shall be provided of dimension 30mm L x 15mm W x 3mm D. Vendors to provide suitable brackets for mounting.



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Section – B

Section – B1: Buffered Vibration & Phase Signal List of Steam Turbine Generator (STG) for Rotating Machine Condition Monitoring System (RMCMS). These signals will be available from the 3rd Party TSI system.

Sl. No.	KKS Tag	Signal Description	Signal Range	
1	MAD11CY021	ABS BRG1 VIBRN PED 1	0-20 mm/s	0- pk
2	MAD11CY022	ABS BRG1 VIBRN PED 2	0-20 mm/s	0- pk
3	MAD11CY041	REL SHAFT VIBRN BRG 1 X	0-500 µm	pk - pk
4	MAD11CY042	REL SHAFT VIBRN BRG 1 Y	0-500 µm	pk - pk
5	MAD12CY021	ABS BRG2 VIBRN PED 1	0-20 mm/s	0- pk
6	MAD12CY022	ABS BRG2 VIBRN PED 2	0-20 mm/s	0- pk
7	MAD12CY041	REL SHAFT VIBRN BRG 2 X	0-500 µm	pk - pk
8	MAD12CY042	REL SHAFT VIBRN BRG 2 Y	0-500 µm	pk - pk
9	MAD13CY021	ABS BRG3 VIBRN PED 1	0-20 mm/s	0- pk
10	MAD13CY022	ABS BRG3 VIBRN PED 2	0-20 mm/s	0- pk
11	MAD13CY041	REL SHAFT VIBRN BRG 3 X	0-500 µm	pk - pk
12	MAD13CY042	REL SHAFT VIBRN BRG 3 Y	0-500 µm	pk - pk
13	MAD14CY021	ABS BRG4 VIBRN PED 1	0-20 mm/s	0- pk
14	MAD14CY022	ABS BRG4 VIBRN PED 2	0-20 mm/s	0- pk
15	MAD14CY041	REL SHAFT VIBRN BRG 4 X	0-500 µm	pk - pk
16	MAD14CY042	REL SHAFT VIBRN BRG 4 Y	0-500 µm	pk - pk
17	MKD11CY021	ABS BRG5 VIBRN PED 1 (GEN FRONT)	0-20 mm/s	0- pk
18	MKD11CY022	ABS BRG5 VIBRN PED 2 (GEN FRONT)	0-20 mm/s	0- pk
19	MKD11CY041	REL SHAFT VIBRN BRG 5 (GEN FRONT) X	0-500 µm	pk - pk
20	MKD11CY042	REL SHAFT VIBRN BRG 5 (GEN FRONT) Y	0-500 µm	pk - pk
21	MKD12CY021	ABS BRG6 VIBRN PED 1 (GEN REAR)	0-20 mm/s	0- pk
22	MKD12CY022	ABS BRG6 VIBRN PED 2 (GEN REAR)	0-20 mm/s	0- pk
23	MKD12CY041	REL SHAFT VIBRN BRG 6 (GEN REAR) X	0-500 µm	pk - pk
24	MKD12CY042	REL SHAFT VIBRN BRG 6 (GEN REAR) Y	0-500 µm	pk - pk
25	MKD15CY021	ABS BRG7 VIBRN PED 1 (EXC REAR)	0-20 mm/s	0- pk
26	MKD15CY022	ABS BRG7 VIBRN PED 2 (EXC REAR)	0-20 mm/s	0- pk
27	MKD15CY041	REL SHAFT VIBRN BRG 7 (EXCREAR) X	0-500 µm	pk - pk
28	MKD15CY042	REL SHAFT VIBRN BRG 7 (EXC REAR) Y	0-500 µm	pk - pk
29	MAD12CY045	Key Phasor	0-360deg	

Note: 1) The condition monitoring system rack / panel shall be provided in the Main CER for the above list of signals. The required rack / panel shall be kept along with the other VMS panel/s (as in Section-A1).
2) The vendor shall provide 2 nos. of pre-fabricated BNC (M) connector cable of 3 meters length.



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Section – B2: Buffered Vibration & Phase Signal List of BFP Drive Turbine (BFPDT) for Rotating Machine Condition Monitoring System (RMCMS). These signals will be available from the 3rd Party TSS system.

List of Signals for BFPDT-A			
SN.	KKS Tag	Signal Description	Signal Range
1	XKD14CY042A	GEAR BOX LSS (RJB) RELATIVE SHAFT VIBRATION	0-200 μ m
2	XKD14CY042B	GEAR BOX LSS (RJB) RELATIVE SHAFT VIBRATION	0-200 μ m
3	XKD11CY041A	GEAR BOX HSS (FJB) RELATIVE SHAFT VIBRATION	0-200 μ m
4	XKD11CY041B	GEAR BOX HSS (FJB) RELATIVE SHAFT VIBRATION	0-200 μ m
5	XAD12CY041A	TURBINE F.J.B. VIBRATION	0-200 μ m
6	XAD12CY041B	TURBINE F.J.B. VIBRATION	0-200 μ m
7	XAD11CY042A	TURBINE R.J.B. VIBRATION	0-200 μ m
8	XAD11CY042B	TURBINE R.J.B. VIBRATION	0-200 μ m
9	XYA12CY021A	FRONT BRG. HOUSING VIBRATION	0-25 mm/s
10	XYA12CY021B	FRONT BRG. HOUSING VIBRATION	0-25 mm/s
11	XYA11CY021A	REAR BRG. HOUSING VIBRATION	0-25 mm/s
12	XYA11CY021B	REAR BRG. HOUSING VIBRATION	0-25 mm/s
13	XAD12CY021A	TURBINE KEYPHASER	0-360deg
14	XKD14CY021	GEAR BOX KEYPHASER	0-360deg

List of Signals for BFPDT-B			
SN.	KKS Tag	Signal Description	Signal Range
1	XKD24CY042A	GEAR BOX LSS (RJB) RELATIVE SHAFT VIBRATION	0-200 μ m
2	XKD24CY042B	GEAR BOX LSS (RJB) RELATIVE SHAFT VIBRATION	0-200 μ m
3	XKD21CY041A	GEAR BOX HSS (FJB) RELATIVE SHAFT VIBRATION	0-200 μ m
4	XKD21CY041B	GEAR BOX HSS (FJB) RELATIVE SHAFT VIBRATION	0-200 μ m
5	XAD22CY041A	TURBINE F.J.B. VIBRATION	0-200 μ m
6	XAD22CY041B	TURBINE F.J.B. VIBRATION	0-200 μ m
7	XAD21CY042A	TURBINE R.J.B. VIBRATION	0-200 μ m
8	XAD21CY042B	TURBINE R.J.B. VIBRATION	0-200 μ m
9	XYA22CY021A	FRONT BRG. HOUSING VIBRATION	0-25 mm/s
10	XYA22CY021B	FRONT BRG. HOUSING VIBRATION	0-25 mm/s
11	XYA21CY021A	REAR BRG. HOUSING VIBRATION	0-25 mm/s
12	XYA21CY021B	REAR BRG. HOUSING VIBRATION	0-25 mm/s
13	XAD22CY021A	TURBINE KEYPHASER	0-360deg
14	XKD24CY021	GEAR BOX KEYPHASER	0-360deg

Note: The condition monitoring system rack / panel shall be provided in the Main CER for the above list of signals. The required rack / panel shall be kept along with the other VMS panel/s (as in Section-A1).



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EE Mandatory Spares (Bidder to submit offer with unit prices):

- a) Proximity Transducer = 10 % or 2 nos. of each type.
- b) Piezoelectric Vibration Transducer = 10 % or 2 nos. of each type.
- c) LVDT type Transducer, if any = 10 % or 2 nos. of each type.
- d) Power Supply Module = 10% of total quantity used or 2 nos. whichever is more for each type/rating.
- e) Relays = 20% of total quantity used or 1 nos. whichever is more for each type/rating.
- f) Electronic Module = 10 % or min. 1 no. of each type.
- g) Special Cable = 10 % of total quantity
- h) Interfacing system with DCS = 1 set

FF Quality Requirements:

1. Following minimum test requirements to be met by the bidders for their offered system:

- Calibration report of Sensors for the selected / approved Range with curves shall be furnished.
- For Vibration Sensors, Frequency response curves and for Proximity probes, Gap v/s voltage data to be furnished. Sample reports shall be included as a part of Quality plan.
- Calibration of Monitors for the approved Range shall be submitted.

The above documents shall form part of Acceptance documentation.

2. TESTING & INSPECTION:

- The equipment covered under this specification shall be subject to vendor's Quality Plan to be approved by customer before start of manufacture. To ensure that quality is in-built in each equipment the Quality Assurance System manual & Quality Plan indicating the system followed by the vendor shall be submitted to purchaser for his review along with the offer.
- The Testing shall include following Type test, in addition to the Routine Tests,

3. TYPE TEST:

The Vendor shall furnish the type test reports for the Vibration Monitoring System, after receipt of order; confirmation for submission of type test report shall be mentioned in the offer. Type test results and certificate shall be acceptable provided it meets the following:

- i) The same has been carried out by the Vendor on exactly the same model / rating of equipment.
- ii) There has been no change in the components from the offered equipment & tested equipment.
- iii) The test has been carried out as per the latest standards along with amendments as on the date of bid opening and as indicated below

4. SPECIAL REQUIREMENT FOR SOLID STATE EQUIPMENTS/ SYSTEMS

The minimum type test reports, which are to be, submitted for each of the major C&I systems shall be as indicated below:

i) Surge Withstand Capability (SWC) for Solid State Equipment Systems

All solid state systems/ equipment shall be able to withstand the electrical noise and surges as encountered in actual service conditions and inherent in a power plant. All the solid state systems/ equipment shall be provided with all required protections that needs the surge withstand capability as defined in ANSI 37.90.1/ IEC-255.4. Hence, all front end cards which receive external signals like Analog input & output modules, Binary input & output modules etc. including power supply, data highway, data links shall be provided with protections that meets the surge withstand capability as defined in ANSI 37.90.1/ IEC-255.4. Complete details of the features incorporated in electronics systems to meet this requirement, the relevant tests carried out, the test certificates etc. shall be submitted along with the proposal. As an alternative to above, suitable class of IEC-255-4 which is equivalent to ANS/37.90.1/IEEE-472 may also be adopted for SWC test.



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- ii) Dry Heat test as per IEC-68-2-2 or equivalent.
- iii) Damp Heat test as per IEC-68-2-3 or equivalent.
- iv) Vibration test as per IEC-68-2-6 or equivalent.
- v) Electrostatic discharge tests as per IEC 801-2or equivalent.
- vi) Radio frequency immunity test as per IEC 801-6 or equivalent.
- vii) Electromagnetic Field immunity as per 801-3 or equivalent.

Test listed at item no. v, vi, vii, above are applicable for electronic cards only.

GG Documentation:

- All documentation shall be in English language.
- Following documents shall be supplied along with offer.
 - a) Bill of material of the offered system.
 - b) Allocation of vibration monitors with respect to machines being monitored.
 - c) Configuration diagram of the offered system with networking details.
 - d) Specification / data sheets of various devices offered.
 - e) Reference list of users for vibration analysis & diagnostics system for coal fired Turbine generator set of similar rating along with details of Plant auxiliaries monitored.

- After award of contract, following documentation in no. of copies as mentioned below shall be supplied.

- a) Manufacturing Quality plan
 - b) Field Quality Plan for Storing, Handling, Erection, Pre commissioning and Commissioning activity
 - c) Configuration diagram & Machine train diagram
 - d) Mounting details for sensors
 - e) Wiring and cabling diagrams for Cabinets & other devices
BOM, GA drawing & Rack layout drg
Loop scheme and cable schedule
Mounting blocks and JB Drawings
Datasheet and technical literatures
- Soft-copy, within 2 weeks of placements of P.O

- f) Test certificate & test results
 - g) Calibration results for sensors
 - h) Test reports for Cables
 - i) Type test results
- 2 copies, after completion of tests

- j) Operation & maintenance manual for the system including wiring diagram, circuit diagrams, Sensor details, Server, Printer, Panel display, Calibration equipment etc.
- 2 copies along with the equipment +
1 copy to BHEL

Also one set of soft copy on CD ROM for all the datasheet/drawings/test reports are to be furnished to BHEL after placement of Purchase order.

The drawings under (a),(c),(d),(e),(f) & (i) will be for approval & others are for information & records.



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HH Training:

Vendor shall provide necessary training on the operation & application to BHEL / End-User. The training shall cover the basic aspects of Vibration monitoring, details of the System supplied, Analysis method, Operation and Maintenance.

1. Training at vendor's works / Training centre: The vendor shall conduct training of 4 Man-weeks.

All expenses inherently related to training shall be borne by the vendor and shall include but not limited to travel expenses, lodging and per diem charges, medical insurance, instructor's fee, programme and miscellaneous cost to be incurred during the training.

The vendor shall be responsible for the development of the Training Module and the Programme Schedule, which shall be submitted to End-user for approval.

The components of the training module shall include but not limited to the training procedure / methodology, instructional materials such as audio visual materials, CD/ Portable drive, slides and manual for each trainee. The training materials shall be in English language only.

Three (3) sets of materials included in the training module shall be provided to the End-user after completion of the training program.

2. Training at Site: The vendor shall provide a comprehensive training program related to design, application, operation and maintenance including trouble shooting of the vendor's supplied system and equipment at the Site, starting from the Start of Commissioning and thereafter up to the Handing Over of the System to the End-user.

II Packaging:

Packaging shall be as per specification ref. no. CE/409-416/TSS-VMS/PKG enclosed.

JJ Erection & Commissioning (E & C) Scope:

1. Scope of E&C for Vibration Monitoring System (VMS):

Vendor shall provide separate offers for Erection activity (as applicable), Supervision of Erection and total Commissioning of the offered Vibration Monitoring System as detailed below.

- Verification of Bill of material as per packing list at site
- Collection of material from stores
- Checking and calibration of sensors using portable shaker table.
- Mounting of offered vibration sensors with its mounting block on the machine bearing casing and terminate the sensor cable to Local Junction box supplied.
- Mounting of proximity / phase measurement sensor and its bracket shall be suitably installed by Vendor at site and terminate the sensor cable to Local Junction box supplied.
- Supervision of balance Erection activity of offered System
- Commissioning of offered System
- Loop check between VMS Panel to DCS
- Handing Over the system to End-User
- Training the operation personnel on operation and maintenance aspects while carrying out the above E & C activities.
- **Relevant documentation for commissioning of this system in line with specification requirement.. such as signed protocol with end user to be furnished along with calibration data, as applicable.**

Note: The total responsibility of E&C for the offered system shall rest with the vendor. Vendor shall offer for above mentioned E&C activities on as required basis. Limitation of number of days / visit for E&C activities is not acceptable.



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2. Scope of E&C for Rotating Machine Condition Monitoring System (RMCMS):

Vendor shall provide separate offers for Erection activity (as applicable), Supervision of Erection and total Commissioning of the offered Analysis & Diagnostics system, as detailed below

- Fiber optic cable splicing and termination at both ends, between Panel to Panel at various control rooms, Panel to Server/User PC and Server to DDCMIS.
- Carrying out pre-commissioning checks, energizing Cabinets & PC.
- Commissioning of individual services.
- Installing various software packages on PC & establishing the operation.
- Checking for all functions of hardware and software when the plant is totally commissioned with all auxiliaries
- Commissioning of Diagnostics / Expert system
- Training the operation personnel on operation and maintenance aspects while carrying out the above E & C activities.
- Handing over the offered system/s to End-User.
- **Relevant documentation for commissioning of this system in-line with specification requirement, such as signed protocol with end user to be furnished along with calibration data, as applicable.**

Note: The total responsibility of E&C for the offered system shall rest with the vendor. Vendor shall offer for above mentioned E&C activities on as required basis. Limitation of number of days / visit for E&C activities is not acceptable.



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SECTION – D

REF. : CE/416/RMCMS/BHUSAWAL/PG

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PACKING SPECIFICATION

Enclosure: CE/409-416/TSS-VMS/PKG

REVISION : 00

APPROVED

Ashish M

PREPARED

ISSUED

DATE

D GHOSH

416

18/05/2021



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REF. : CE/409-416/TSS-VMS/PKG

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PACKAGING SPECIFICATION FOR TURBINE SUPERVISORY SYSTEM (TSS), VIBRATION MONITORING SYSTEM (VMS), ANALYSIS & DIAGNOSTICS SYSTEM

REVISION : 00

APPROVED

[Signature] 3/6/14
(R. RAJAM)

[Signature]
(SMPATEL)

PREPARED

ISSUED

DATE

[Signature]
D. Ghosh
Sr Engr - BPE
(MADHU CHANDRA)

409-416

03/06/2014



**Packaging Specification for
Turbine Supervisory System (TSS),
Vibration Monitoring System (VMS) &
Analysis & Diagnostics System**

Ref.: CE/409-416/TSS-VMS/PKG
REV. NO.: 00
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1.0 Packaging Guidelines

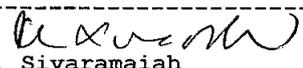
- The detailed guideline for packaging is provided in specification reference ED 0490092, Rev. 05. The packing shall be separate for TSS & VMS, in separate boxes.
- 1.1** For Vibration sensors, Monitors, rack, special cable and signal conditioners being dispatched from OEM (countries other than India to India) packing which is suitable for transportation by Lorry and storage at site for extended periods up to 24 months, shall be used. For this a reference standard ED 490092 Rev 05 clause 3.1.2 is attached. OEMs shall follow this standard at minimum. If any other OEM standard packing is available same shall be submitted to BHEL for review and acceptance as part of Technical offer.
- 1.2** Imported items shall be packed in best fit boxes and total number of boxes per unit of TSS shall not exceed 1 box and for VMS shall not exceed 2 boxes.
- 1.3** For Panels, Server PC, Printer, Junction boxes, mounting pad / bracket, field cables etc (i.e. typically from Indian manufacturers) packing which is suitable for transportation by Lorry and storage at site for extended periods up to 24 months, shall be used. For this a reference standard ED 490092 Rev 05 clause 3.1.1 is attached. OEMs shall follow this standard at minimum. If any other OEM standard packing is available same shall be submitted to BHEL for review and acceptance as part of Technical offer.
- 1.4** Indigenous items, except for bare panels & cables, shall be packed in best fit boxes and total number of boxes per unit of TSS shall not exceed 2 box, for VMS shall not exceed 4 boxes and for Analysis & Diagnostics system shall not exceed 1 box.
- 1.5** Packing shall be separate for each unit of the project, TSS, VMS & Mandatory spares separately.
- 1.6** Packing of the items shall be such that they can be repacked properly after material verification at customs / site.
-

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PROCEDURE FOR PACKING OF CONTROL EQUIPMENTS USING PLYWOOD.

1. **PURPOSE:** To describe the materials and procedure for Packing.
2. **SCOPE:** Applicable for packing of control cubicles, loose items, spares of Control Equipment and Transmission System Control products.
3. **MATERIALS**
 - 3.1. **WOOD**
 - 3.1.1 **For Inland contracts:**
 - 3.1.1.1 Plywood of Boiling Water Resistance (BWR) grade and termite, fungus proof as per IS: 303 of 12 mm thick for control cubicles, single and multi cubicles, loose items and spares cases. The plywood shall be bonded with high Quality Phenol Formaldehyde Synthetic Resin and specially treated with preservatives to repel termites and wood destroying organisms. The plywood shall with stand the stress caused by cyclic changes in weather conditions. It shall be durable and resistant to heat, sun and moisture. The sheets such procured shall have IS mark IS 303 and BWR grade stamped on it.
 - 3.1.1.2 Silver oak wood of cross section 45x45 mm as support battens for Loose items, spares and single suit, two suit, three suit Cubicles and 70x45 mm for longer sections to be used. These Silver oak wood battens shall be treated with ASCU solution as defined in 4.0. In the case of plywood, treatment with ASCU solution need not be done.

Alternative to silver oak battens, Plywood support battens of suitable cross section and combination of thickness can also be used as per clause 3.1.1.4


APPROVED : M. Sivaramaiah

PREPARED :
PGD/KPN

ISSUED: DATE:
STDS GROUP 30/03/13

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3.1.1.3

Plywood for general purposes i.e. moisture resistance or MR grade (Commercial ply wood) and termite, fungus proof as per IS: 303 of 9 mm / 12 mm thick for control cubicles, single and multi cubicles, loose items and spares cases. The plywood shall be bonded with high quality Phenol Formaldehyde Synthetic Resin and specially treated with preservatives to repel termites and wood destroying organisms. The plywood shall with stand the stress caused by cyclic changes in weather conditions. It shall be durable and resistant to heat, sun and moisture. The sheets such procured shall have IS mark IS 303 and MR grade stamped on it. 9 mm thick plywood can be used with additional plywood support/ reinforcement suitable battens both for small cases and also for panels. Support batten as indicated at 3.1.1.4 shall be used.

Sample drawings of panels & loose boxes are attached for ready reference.

[Fig : 10 to 13]

3.1.1.4 Support Battens:

Ply wood sheet of cross section 18 mm x (100 mm) for support batten for loose items, spares, and plywood sheet of cross section 18 mm thk x 100 to 150 mm width as support batten for standard panels up to 2450 x 1350 x 2500 mm panels. Support batten of plywood cross section 12 thk x 75 to 100 mm can also be used for small cases apart from 18 mm x 100 mm cross section. These plywood support battens can also be used in place of silver oak support battens as referred in clause 3.1.1.2. Additional support battens/ cross battens of suitable sizes are to be provided on need basis.

Sample drawings of panel's .i.e. single suit, two suite and three suit cubicles are attached for ready reference [Fig: 10 to 13].

Special support battens for Rlys and similar panels:

Plywood of cross section 18 mm x 75mm x 3 no's at both bottom end and top end of front and back shock's , and also at top portion of both corner shock's for fixing with bolt and nut/ clamps, and 18 mm x 150 mm x 2 nos cross section as support batten/ slanting reinforcement batten on all sides. On need basis 18mm x 125 mm x 2 to 3 no's of plywood cross section can also be used additionally depending upon the size and weight of the panel.

Plywood shock's can be fixed with both Bolts and mechanical latching clamps or combination of both as the case may be.

Sample drawings of panels are attached for ready reference.

[Fig : 8 & 9]

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3.1.2 For Export Contracts

- 3.1.2.1 Plywood of Marine grade as per IS: 710 of 9 / 12 mm Thick for control cubicles of single / two / three suite for loose items and spare cases. For suit of four and longer cubicle sections, 19mm thick is to be used.

It shall be highly resistant to attacks from fungi, termites and wood destroying organisms including marine borers. The plywood shall withstand the stress caused by cyclic changes in weather conditions. It shall be durable and resistant to heat, sun and moisture. The sheet shall have IS: 710 and marine grade marking.

- 3.1.2.2 Same as clause 3.1.1.2.

- 3.1.3 BHEL EDN will be carrying out test on ISI marked ply Wood whenever required.

- 3.2 Fasteners: M8 x 130 mm and M8 x 150 long zinc plated Bolts and M8 zinc plated nuts for fixing, and spring Washers or suitable size can also be used.

- 3.3 Nails: Nails of dia 3.15 mm and about 40 mm for nailing of plywood and silver oak batten. Suitable smaller size is to be used for other nailing.

- 3.4 Polyethylene sheet: The polyethylene sheets are used to make covers for the jobs individually. The material shall have a minimum thickness of 0.175 mm (175 microns).

The polyethylene sheet shall be clear and transparent manufactured out of virgin material. Reprocessed material shall not be used.

- 3.5 Bituminised water proof kraft paper - used for lining the inside of shooles of cubicles.

- 3.6 Bitumen coated Hessian polyethylene kraft paper used for lining the inside of top cover for cubicles and all inner and top sides for small boxes.

- 3.7 Rubberised Coirs- used for cushioning and to fill the gap inside packing boxes. The coir shall be about 100 mm wide and 25mm thick.

- 3.8 Foam rubber/U Foam - This is used for covering the delicate items. This material is normally provided by BHEL.

- 3.9 Thermocole (Expanded polystyrene) sheets - This is used for covering delicate items. This material is normally provided by BHEL.

- 3.10 Silica gel - shall be of indication type to conform to IS: 3401: shall be blue in colour while usage.

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3.11 Cotton bag - These are used for holding silica gel. The bags shall have the following matter indicated on them:

BHEL-EDN	SILICA GEL INDICATING TYPE	BANGALORE-560026
BLUE	: ACTIVE	
ROSE	: REDUCED ACTIVITY	
WHITE	: NO ACTIVITY. TO BE REPLACED WITH FRESH SILICA GEL	

- 3.12 Cotton / Plastic tape-This is used for tying small items and also to prevent vibrations of moving parts within the cubicles.
- 3.13 Polyethylene bags - These are to be used for keeping the packing slips. The bag shall be of size 70 mm X 100 mm (minimum).
- 3.14 Hessian cloth, twine thread, paint will have to be used in packing certain items.
- 3.15 Marking plate - This shall be of anodized aluminium sheet. Details and specifications are given in Fig-3.
- 3.16 Marking ink - Ink used shall be normally black in colour. The ink shall be indelible, non fading and non washable in water.
- 3.17 Packing Slip Holder - This shall be of galvanised iron tinned sheet / aluminium sheet.
- 3.18 Mechanical Latching clamps : For CLW Railway panels and similar Panels self locking clamps can also be used on need basis in conjunction with or apart from regular bolt and nut fixing arrangement. Sample drawing attached [refer Fig.7]. For reusable boxes, these clamps provides easy locking and unlocking arrangement. These clamps will be made available from BHEL in some cases.
- 3.19 Flex/Vinyl digital print media for labeling:
Labels made out of Flex/Vinyl/ other digital media shall be used for export contracts & some prestigious domestic contracts on need basis apart from existing present marking/ labeling system.
- 3.20 Aluminium foil for packing:
On need basis, suitable size & thickness of aluminium foil shall be used for packing of electronic panels and loose items for both indigenous & export contracts.
- 3.21 Pallets :
All cubicles are mounted on the pallets by BHEL. For loose items, HMI items & small cabinets for which no pallets are available, suitable size pallets have to be arranged by the contractor.



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4.0 Chemical treatment for silver oak preservation

4.1 The silver oak battens are to be treated with ASCU solution. For plywood wood treatment is not required.

4.2 The chemical used shall be ready mix ASCU paste. This consists of Arsenic, copper sulphate, sodium dichromate. This paste shall be mixed at the rate of 1 kg of paste per 10 liters of water. Alternate to this CCA can also be used as indicated at para 4.4

4.3 The chemical treatment shall be done at the premises of the contractor. A cement concrete tank of capacity to hold a minimum of 2000 liters of solution shall be constructed. The solution shall be prepared in the presence of BHEL- EDN's representative by contractor. The wooden battens shall be soaked in the solution for a minimum of 12 hours.

The solution shall be replenished after treating a maximum of 12 cubic meters of wood for 2000 liters of solution. A log book shall be maintained by the contractor to give the details of date of preparation of solution, quantity of solution prepared, quantity of chemicals used, quantity of wood treated and the details of replenishment.

Samples of solutions [only paste before mixing] shall be tested at the laboratories designated by BHEL. The testing fees to be paid to the laboratories will have to be borne by the contractor. The solution [paste] shall be tested as and when required.

4.4 Specifications for water soluble type wood preservatives:

Copper - Chromium - Arsenic [CCA]:

Copper - Chromium - Arsenic preservative formulation shall be as per IS : 10013 Part - II - 1981 shall consist of following active ingredients in nominal proportions by weight as shown below:

Arsenic Pentoxide $As_2O_5 \cdot 2H_2O$ 12.5

Copper Sulphate $CuSO_4 \cdot 5H_2O$ 37.5

Sodium Dichromate $Na_2Cr_2O_7 \cdot 5H_2O$ 50.0

Or

Potassium Dichromate $K_2Cr_2O_7$

5.0 Jointing of plywood- to the extent possible, single plywood sheet shall be used in case of equipment of large size, jointing is allowed as bellow.

5.1 The joining shall be as close to the center of equipment as possible, but not less than 500 mm from one edge.

5.2 While joining (2 or more plywood sheets), care shall be taken to fix the sheets in the direction of the grain structure.

5.3a For joining Plywood and Silver oak wooden batten:

While joining, 2 sheets shall be kept close to each other and treated

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silver oak batten of 100 mm width and 45 mm thick to be used and nailed to both plywood sheets alternately (2 numbers) in zig-zag manner.

5.3b For Joining plywood with plywood sheets :

While joining, 2 sheets shall be kept close to each other and plywood sheet batten of minimum 100 to 200 mm width and 18 mm thick to be used depending upon the size of the box/ case and nailed to both plywood sheets alternately (2 numbers) in zig-zag manner. Suitable size nails to be used.

5.4 Jointing of silver oak batten : Only single length silver oak batten shall be used. In case of height or width of equipment is more than 2400 mm, jointing of batten is acceptable. The jointing of batten shall be such that two batten are kept together and one more batten of width & length of about 200 mm to be nailed on both the planks as in Clause 5.3 above.

5.5 The above jointing is to be done close to center of equipment.

6.0 Packing procedure

6.1 Packing of cubicles for inland contracts.

6.1.1 Packing to be done using materials given in clause 3.0.

6.1.2 The cubicles are fixed on wooden pallets. Hence the contractor need not arrange the bottom pallets.

6.1.3 Loose parts : All loose parts in the cubicles, shall be tied using cotton/ plastic tape. Wooden battens shall be provided wherever necessary.

6.1.4 Additional loose items which may be kept inside the cubicle.

- a. The components which are removed from cubicle for loose shipping, such as meters shall be kept inside the cubicle individually kept in wooden box and tied firmly to the bottom of cubicle.
- b. Other items which are given loose in addition to cubicle, shall be packed in separate boxes (like cables).
- c. For transformer cubicles loose items shall be packed in separate boxes and these boxes may be tied firmly in bottom of cubicles.
- d. Items which are bigger in size such as impulse tubes may be kept at the top of cubicles firmly bunched and tied.

6.1.5 Wooden batten : This batten shall be silver oak wood .In case of Cubicle which are not rectangular in shape like control desks, sufficient number of wooden rafters/ battens of proper size shall be provided to give strength to the package.

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- 6.1.6 Silica gel: Silica gel (as in 3.10) packed in cotton bag (as in 3.11) shall be kept at different place inside the cubicle as per BHEL-EDN directions. Each suit of cubicle shall provided with 1 kg of silica gel (for a suit of 4 cubicles, 4 kg of silica gel shall be used).
- 6.1.7 Polyethylene sheet covering: Cubicles shall be covered with polyethylene petticoat (sheet as in 3.4). This shall be tailor made to fit the cubicle. The sealing shall be such as not to allow any moisture to enter the cubicle. This sheet is to be folded to the bottom pallet with wooden planks on 2 larger sides.
- 6.1.8 After completion of this, the arrangement is as shown in Fig.1.
- 6.1.9 Rubberised coir: (as in 3.7) to be nailed from inner side of plywood after pasting kraft paper for full length with a pitch less than 500mm with a min. of 2 rows of cover is to be used.
- 6.1.10 Bituminised water proof kraft paper: (as in 3.5) to be pasted with glue on 4 inner sides of plywood. Whenever 2 pieces of kraft paper are used, the joint shall have an over lap of min 20 mm.
- 6.1.11 Bitumen coated Hessian polyethylene kraft paper (as in 3.6) to be nailed using nails (as in 3.3) on top cover inner surface. This sheet shall project outside on 4 sides by atleast 100 mm and shall be folded and nailed on to the sides. Joining of 2 sheets shall have an overlap of min 20 mm.
- 6.1.12 After completion of above steps, the arrangement shall be as given in Fig.2.
- 6.1.13 Marking Plate : One no (as in 3.15) shall be nailed to the front side of case, item as shown in Fig.3.
- 6.1.14 Case Marking : After complete packing, marking of various details and symbols as given by EDN shall be done using indelible ink (as in 3.16)
- 6.1.15 Packing Slip : Packing slip kept in polyethylene bag (as in 3.18) shall be placed inside the box at appropriate place before closing the top. in addition one more packing slip covered in polyethylene cover and packing slip holder (as in 3.17) shall be nailed to front or rear of shook.
- 6.1.16 At the end of this stage, the arrangement is as shown in Fig.4. Front and rear shook fixing arrangement to the bottom of the pallet is as shown in Fig.5
- 6.1.17 The lifting arrangement of the packed case is **shown in Fig.6**
- 6.2 Packing of cubicles for export contracts Procedure is same as that given in 6.1 except for the following changes:
- Two Polyethylene petticoat (as in 6.1.7) instead of one
 - Fumigation may have to be done if required (BHEL Scope).

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- 6.3 Packing of empty Cubicles Procedure is same as that given in 6.1 except For following changes
- Bituminised kraft paper, bitumen coated Hessian polyethylene paper, silica gel need not be used.
- 6.4 Packing of loose items/spares for inland contracts
- 6.4.1 All the materials and procedure are same as in 6.1 except that :
- No joining of plywood and silver oak batten
 - Inner sides of all 6 sides shall be nailed with bitumen coated Hessian polyethylene kraft paper (as in 3.6) using nails.
 - Kraft paper (as in 3.5) is not required
 - Silica gel quantity is 100 gm approx per box.
 - Rubberised coir is to be nailed to inner surfaces of bottom 4 sides of box.
 - Bottom plywood sheet / pallet shall be of 18 mm thick for all practical purposes and 12 mm thick for smaller boxes on need basis. Suitable bottom beams made out of plywood/ any other wood of suitable cross section 75x36 mm, 75x54 mm, 75x75 mm, 100x100 mm.
 - Support battens of cross section 12x75 mm, 12x100mm, 18x75 mm, 18x100 mm can be used depending upon the size of the boxes. Plywood support battens can be used in the place of silver oak battens.
 - Clause 6.1.10 is not applicable. Individual items to sealed with polyethylene sheet (as in 3.4) and one full cover of polyethylene sheet covering of all items is to be made.
- 6.4.2 In few cases gabled roof (single or double gable) may have to be made, details of which will be given by EDN.
- 6.4.3 Internal Packing: Items that go into the box shall be packed using polyethylene sheet/ U foam/ thermocol sheets/air bubbled sheets/ paper cartoons and cotton tape. Any space left between the job and the sides and the top of the box shall be filled with rubberised coir/air bubbled sheet /thermocole to get proper cushioning effect. Certain items like transformers, reactors, breakers, etc shall be bolted to the bottom of the box using bolts, nuts and washers.
- 6.5 Packing of Loose items/ Spares for Export Contracts: Procedure is same as that given in 6.4 except for following changes:
- Two polyethylene covers to be provided,
 - Fumigation may have to be done, if required, for which payment will be made by EDN.
- 6.6 Any other changes/ new methods/ alternative packing systems can be undertaken with prior information and approval from the dept. For other parameters and further details concerned agency may please be contacted.

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7.0 ACCEPTANCE CRITERIA OF PLYWOOD :

**PLYWOOD FOR GENERAL PURPOSE
GRADE FOR PACKING - AS PER IS:303**

1. Plywood sheets shall have IS:303 & BWR / MR grade stamped on each sheet.
2. Packing/contractor should give a certificate to this effect.
3. Contractor shall identify each sheet with their name/firm in suitable place.
4. Visual checks to be done by packing contractor and EDN-QC CE shipping.
5. For other parameters, testing will be done at authorised laboratories/institutions by EDN on sample basis.

7.1 FOR BWR GRADE : TABLE-1 QUALITY REQUIREMENTS OF PLYWOOD

Sl NO	Defect Category	Maximum Number of Defect Permitted on any one surface of panel (as applicable to Type A Surface of IS:303)
1.	Blister	Nil
2.	Check	Individual check not more than 50mm in length and the total length not more than 300mm/m ²
3.	Discoloration	Nil
4.	Dote	5cm/m ²
5.	Insect hole	Scattered up to 12 holes/m ²
6.	Joints	One joint for every multiple of 200mm provided no individual piece is less than 100mm in width
7.	Knots(dead)	2 up to 12mm dia/m ²
8.	Pin knots(dead)	2/m ²
9.	Pin knots(live)	No restriction
10.	Knots(tight)	6 up to 25mm dia/m ²
11.	Patches	4 patches/m sq provided they are all tight patches & do not mar the appearance



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12. Splits. 2 splits each not more than 1mm wide and length not more than 100mm provided they are filled with suitable filler

13. Swirl Unlimited provided they do not mar the

7.2 FOR MR GRADE : TABLE -2 QUALITY REQUIREMENTS OF PLYWOOD

S/NO	Defect Category	Maximum Number of Defect Permitted on any one surface of panel (as applicable to Type A Surface of IS:303)
1.	Blister	Nil
2.	Check	Individual check not more than 100mm in length and the total length not more than 1000mm/m ²
3.	Discoloration	5 %
4.	Dote	15cm/m ²
5.	Insect hole	Scattered up to 24 holes/m ²
6.	Joints	: No restrictions
7.	Knots (dead)	4 up to 20mm dia/m ²
8.	Pin knots (dead)	: 6/m ²
9.	Pin knots (live)	No restriction
10.	Knots (tight)	: No Restrictions
11.	Patches	Any number provided they are all tight patches & do not mar the appearance
12.	Splits	3 splits each not more than 4 mm wide and length not more than 150 mm provided they are filled with suitable filler
13.	Swirl	NO restrictions

7.3 Thickness of Plywood sheets:

The plywood boards shall be of uniform thickness within specified tolerance limit specified. The faces of plywood boards shall be reasonably smooth.

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7.4 PERMISSIBLE DEFECTS:

Gaps in cores and cross-bands may be permitted except for 3 ply plywood, provided the width of the gap does not exceed 1mm in case of and 2 mm in case of plywood of more than 5 ply and provided such gaps, if more than one, shall be spaces not less than 80mm away from each other and are staggered not less than 50mm away as between ply, the next ply having the same grain direction.

7.5 WORKMANSHIP AND FINISH:

The plywood boards shall be of uniform thickness.

The faces of plywood boards shall be reasonably smooth and face veneers shall be reasonably uniform thickness.

7.6 TESTS:

For testing any other mechanical property of general purpose plywood, Subject to agreement between the purchaser and the supplier, reference shall be made to the provisions of IS 1734 Part 1 and 20)

8.0 Details of Drawings / Figures attached:

- Fig- 1 : Packing of panel - Preparation
- Fig- 2 : Shookes preparation
- Fig- 3 : Marking Plate
- Fig- 4 : Packed panel with plywood and silveroak battens
- Fig- 5 : Detailed joining of pkg shookes with battens
- Fig- 6 : Lifting of packed case
- Fig- 7 : Mechanical Latching clamps
- Fig 8 & 9 : CLW Railway panel packing
- Fig 10 to 13: Packing of panels and spares packing cases.
- Fig 14 : All Units supplying Initial and O & M spares
(Recommendations from Corporate Systems & IT)

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Additional points to be taken care for :

Easy spares [Initial and O&M] Traceability and Identification at units and as well as at sites:

(Recommendations from Corporate Systems & IT)

Sl	Activity
1	All Initial and O&M spares preferably supplied in one lot to site and progressive inventory till all spares are accumulated could be kept at units.
2	Spares (Initial and O&M) should be supplied in separate Boxes / Containers and not mixed in main supply boxes.
3	<ul style="list-style-type: none"> i) Initial spares Box / Container to be labeled as "INITIAL SPARES " in RED. Ref fig: 14 (Page-26). ii) O & M spares Box /Container to be labeled as" O&M SPARES " in GREEN. Ref fig: 14 (Page-26).
4	<ul style="list-style-type: none"> iii) Initial Spares Box to have red Color strip as per diagram. Ref fig: 14 (Page-26). iv) Majority of spares (initial and O&M) are for indoor storage at site. v) O&M spares box to have green Color strip as per diagram. Ref fig: 14 (Page-26).
5	<ul style="list-style-type: none"> vi) Spares (Initial and O&M) Packing list kept inside the boxes and affixed securely outside the box to contain vii) Custom name viii) Project / Power station Name ix) Customer PO No and date x) Sl no of customer PO. xi) Quantity total & dispatched. xii) Unit work order number xiii) All above to be developed from Unit IT System
6	<ul style="list-style-type: none"> xiv) All spares (Initial and O&M) items to have tags (wono, item customer order no, customer item.description)
7	<ul style="list-style-type: none"> xv) Supply of spares by Vendor should also be instructed for following point 2,3,4,5,6 mentioned above.

Action By : Sites on arrival of spares (Initial and O&M)Receipt .

	Activity
1	Material utilized if any from Initial and O&M spares , should have prior written approval of concerned MUs. Such MUs shall also confirm replacement dates which should be entered in the system for creation of repository.



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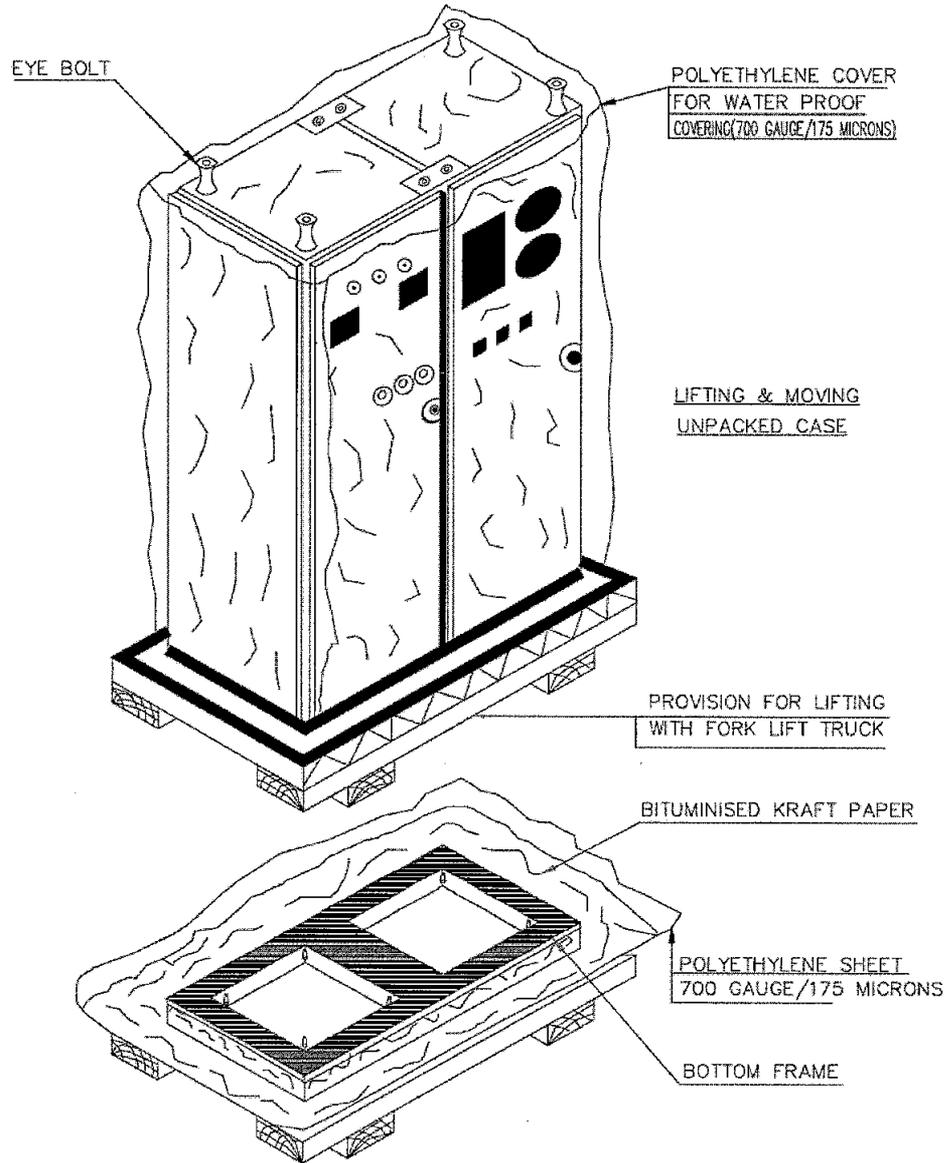


FIGURE-1



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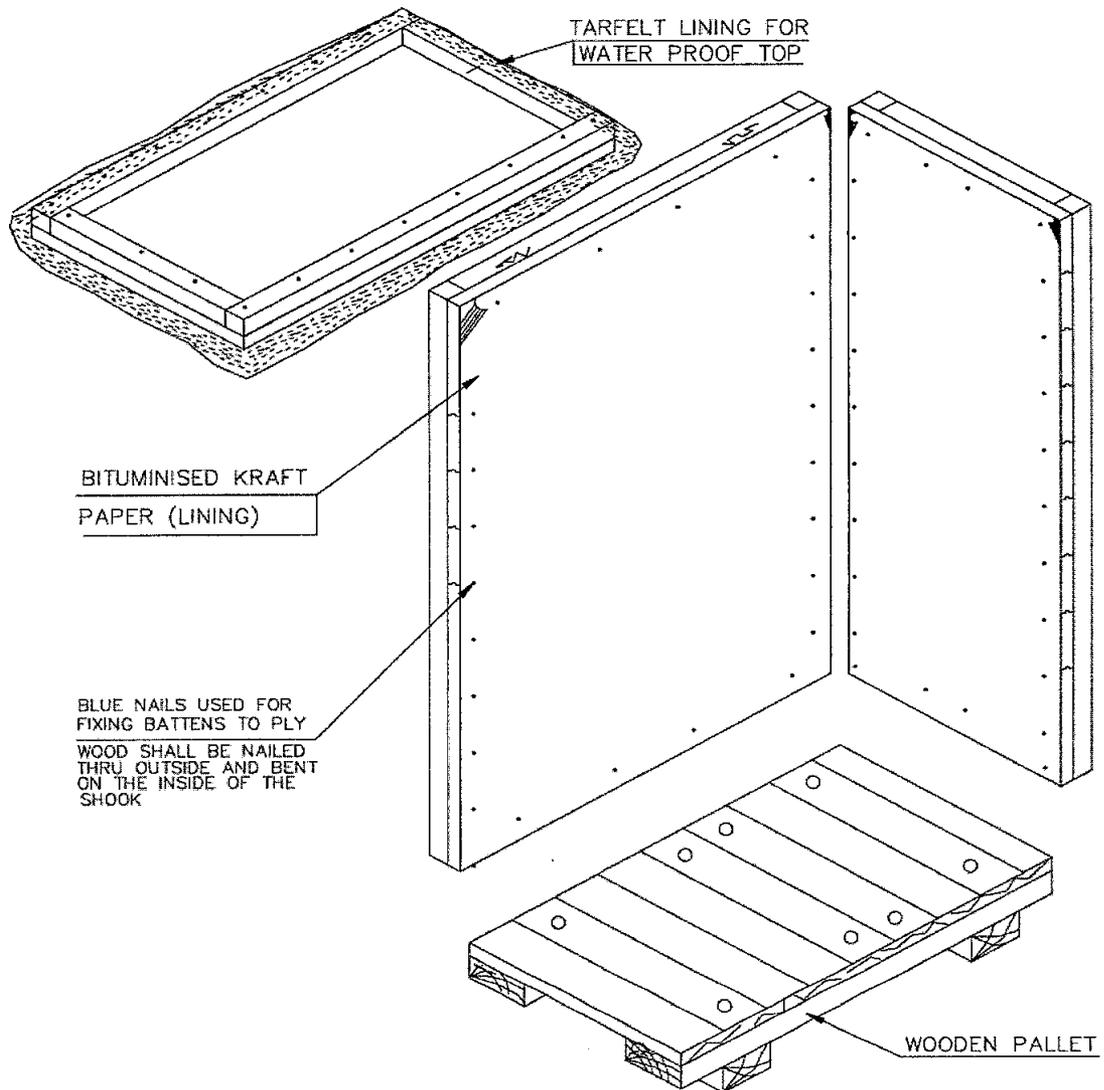


FIGURE-2



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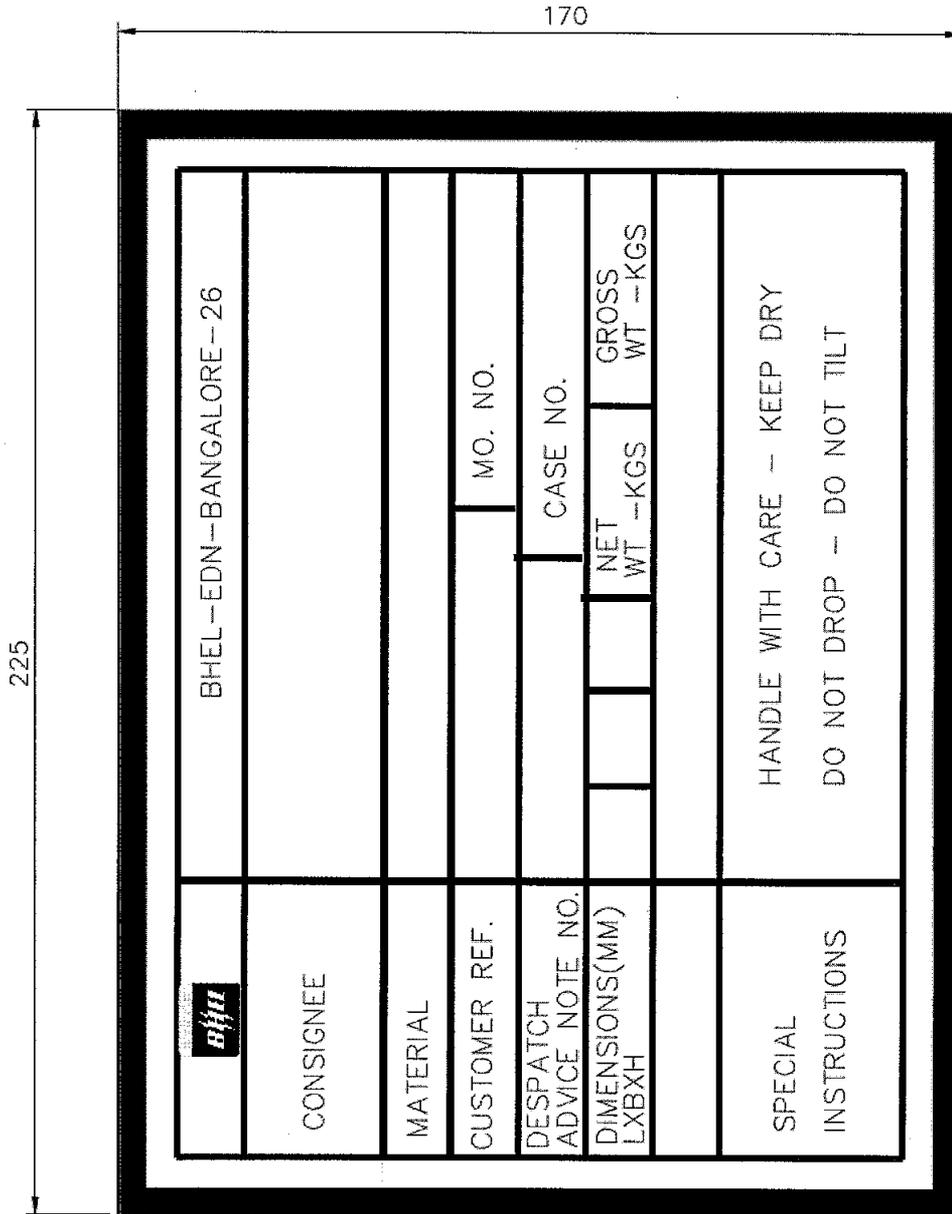


FIG-3 : MARKING PLATE



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PLYWOOD SHOOKS BOLT TYPE WITH SILVER OAK BATTONS

FRONT VIEW

SIDE VIEW

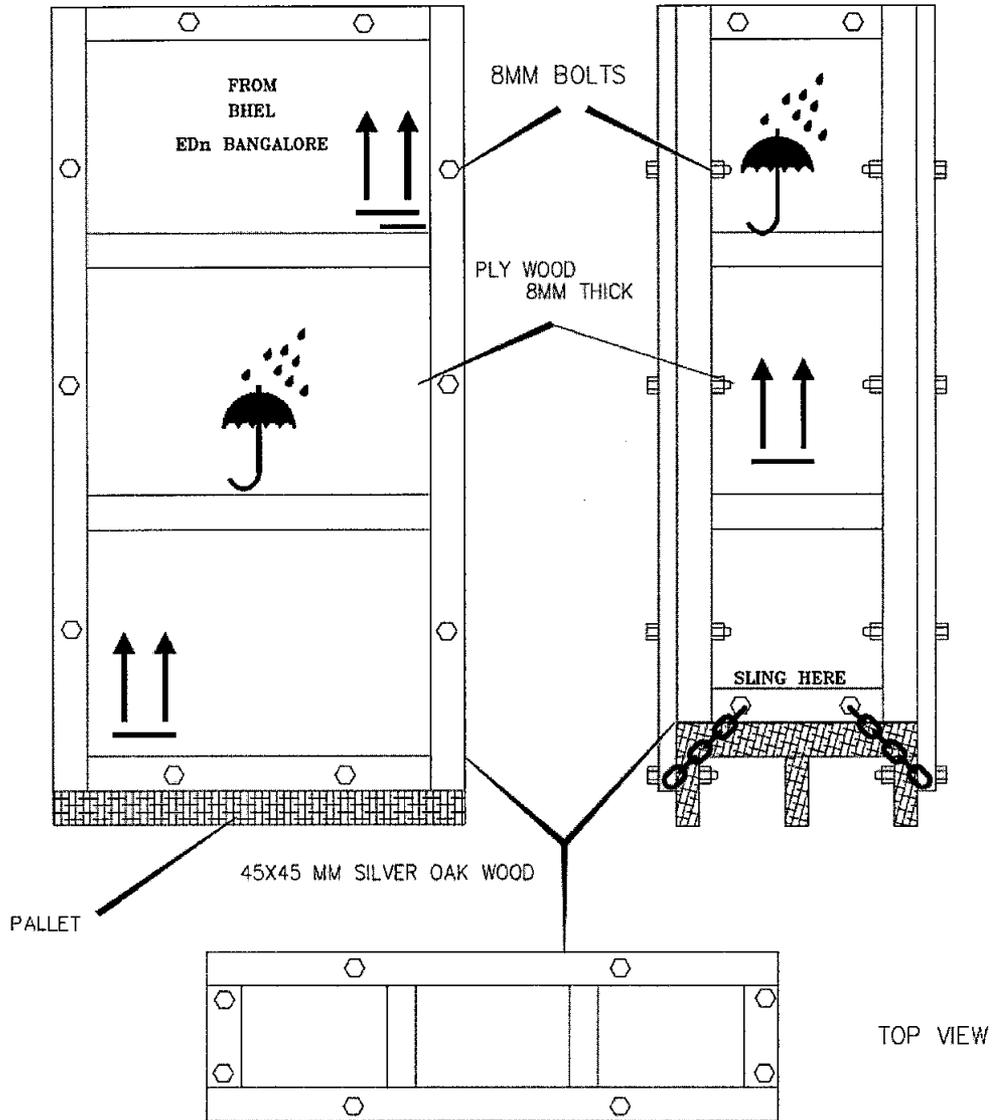


FIG-4



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LAP JOINTS

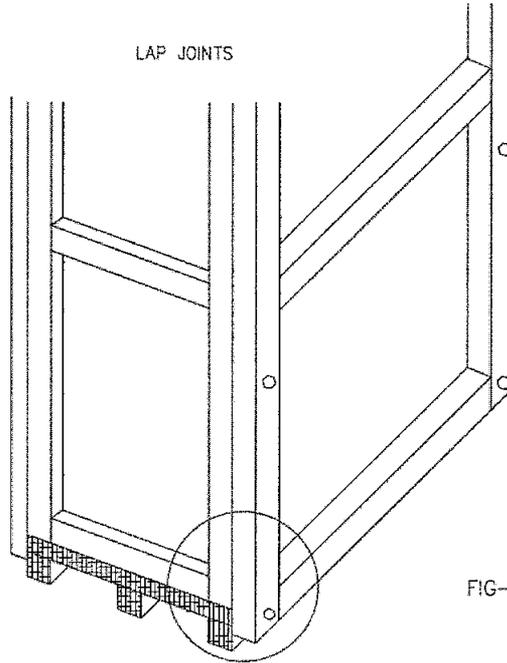
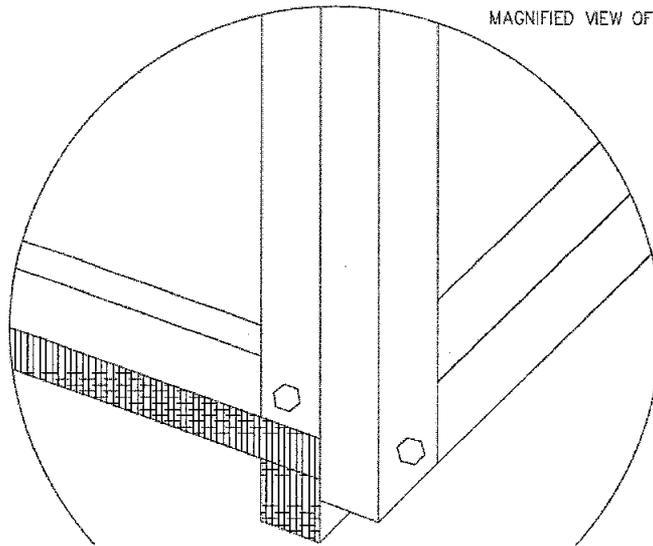


FIG-5

MAGNIFIED VIEW OF THE LAP JOINT





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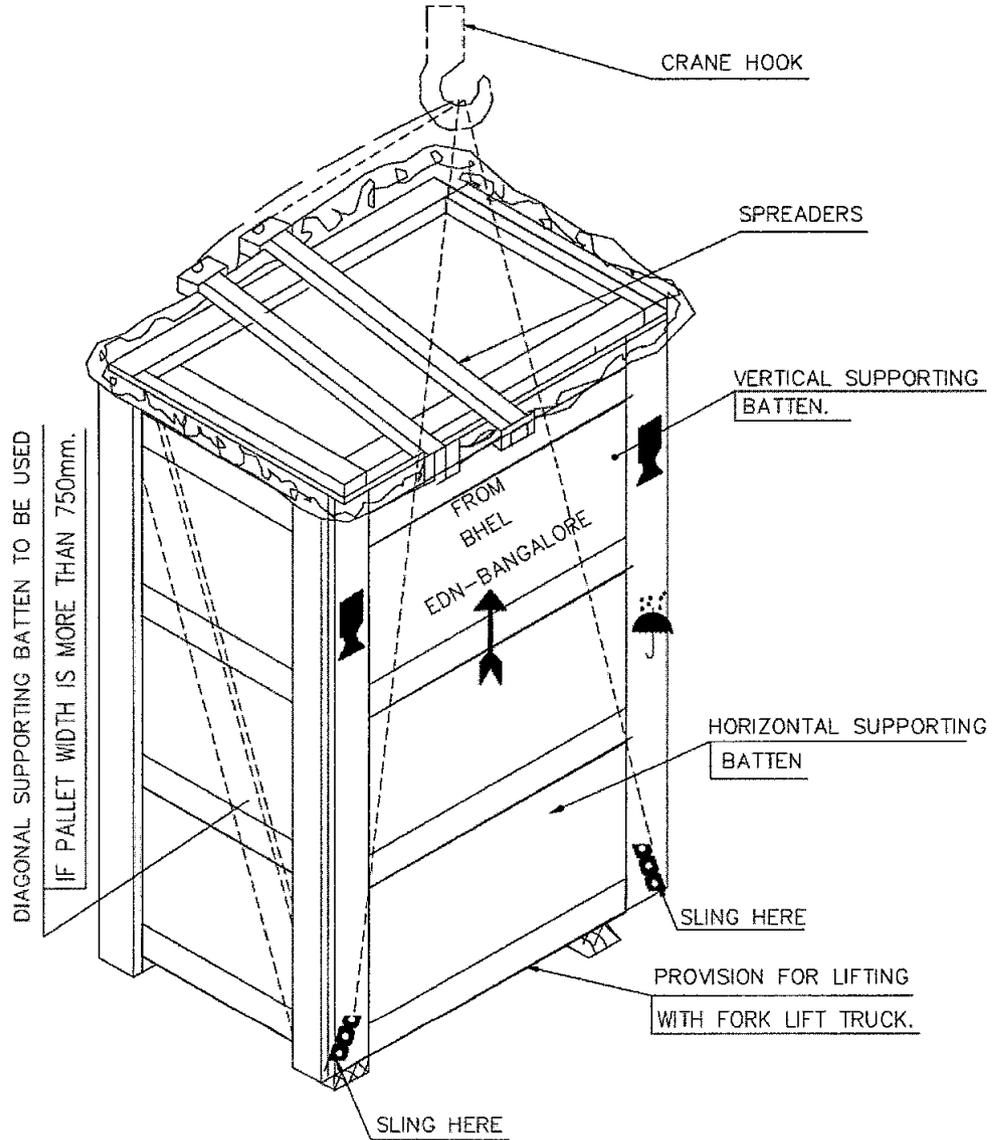


FIG-6 : LIFTING OF PACKED CASE



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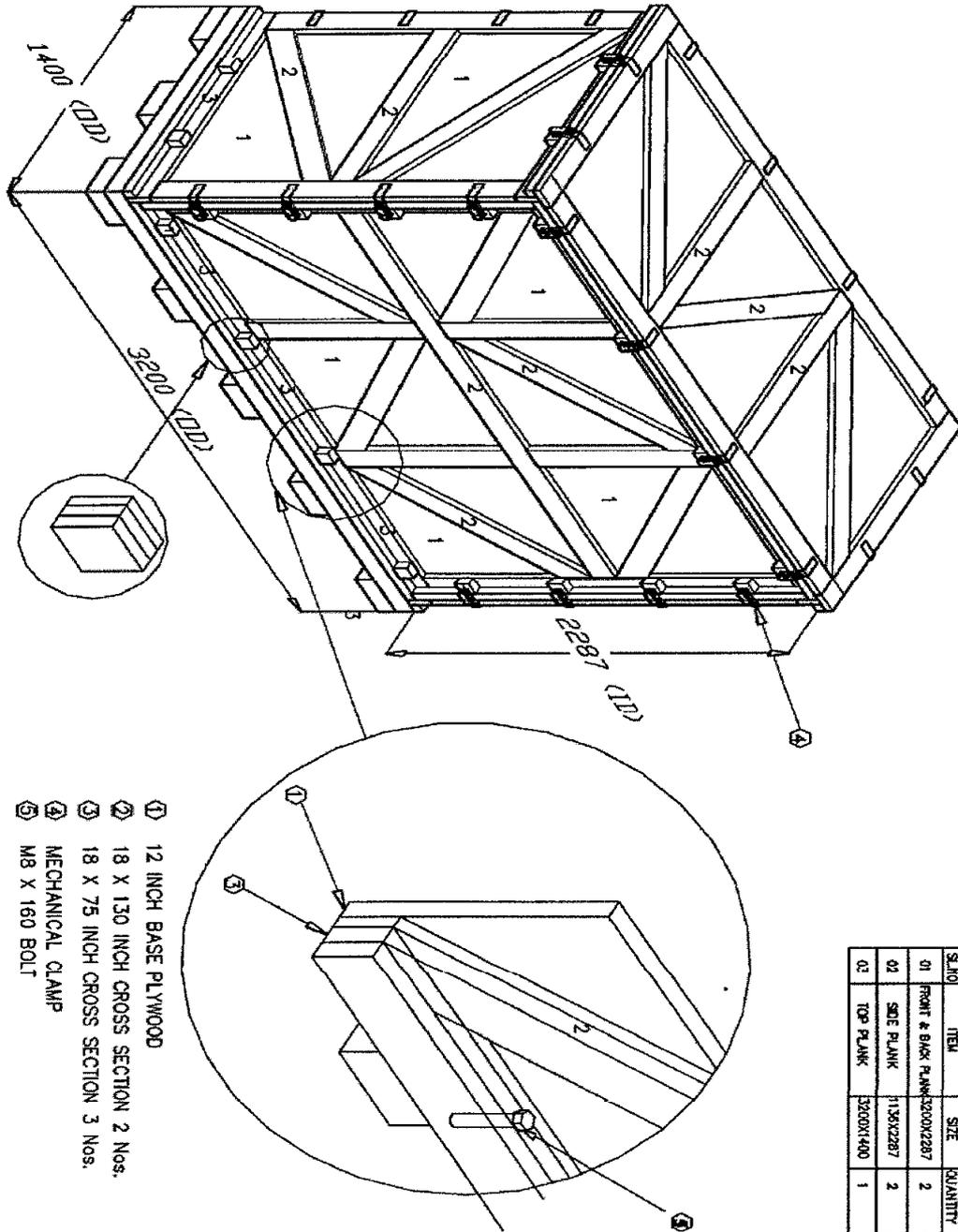


Fig - 8 : CLW Railway Panel Packing with Plywood & Plywood Support Battens



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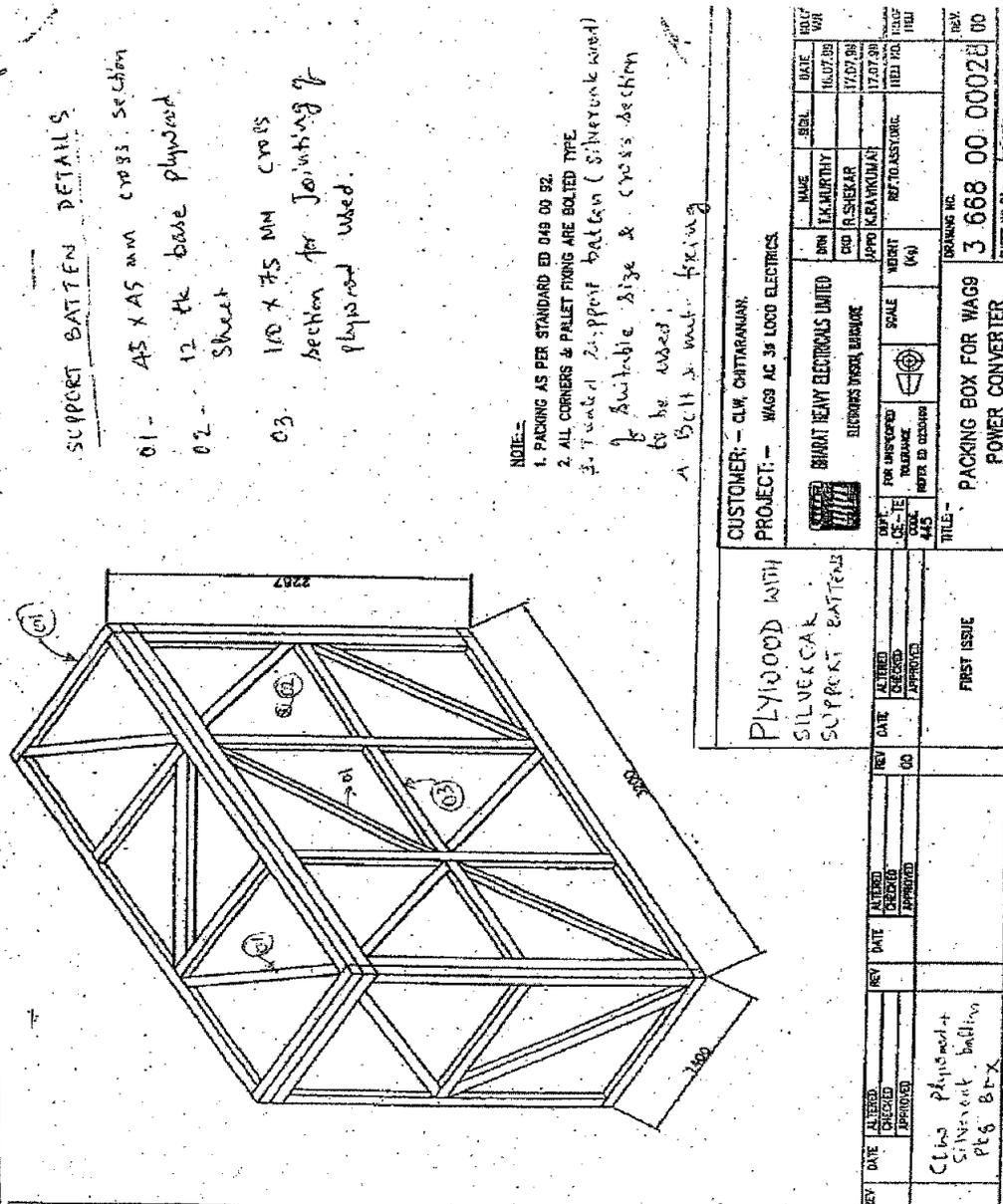


Fig - 9 : CLW Railways Panel Packing with Plywood & Silver Oak Battens



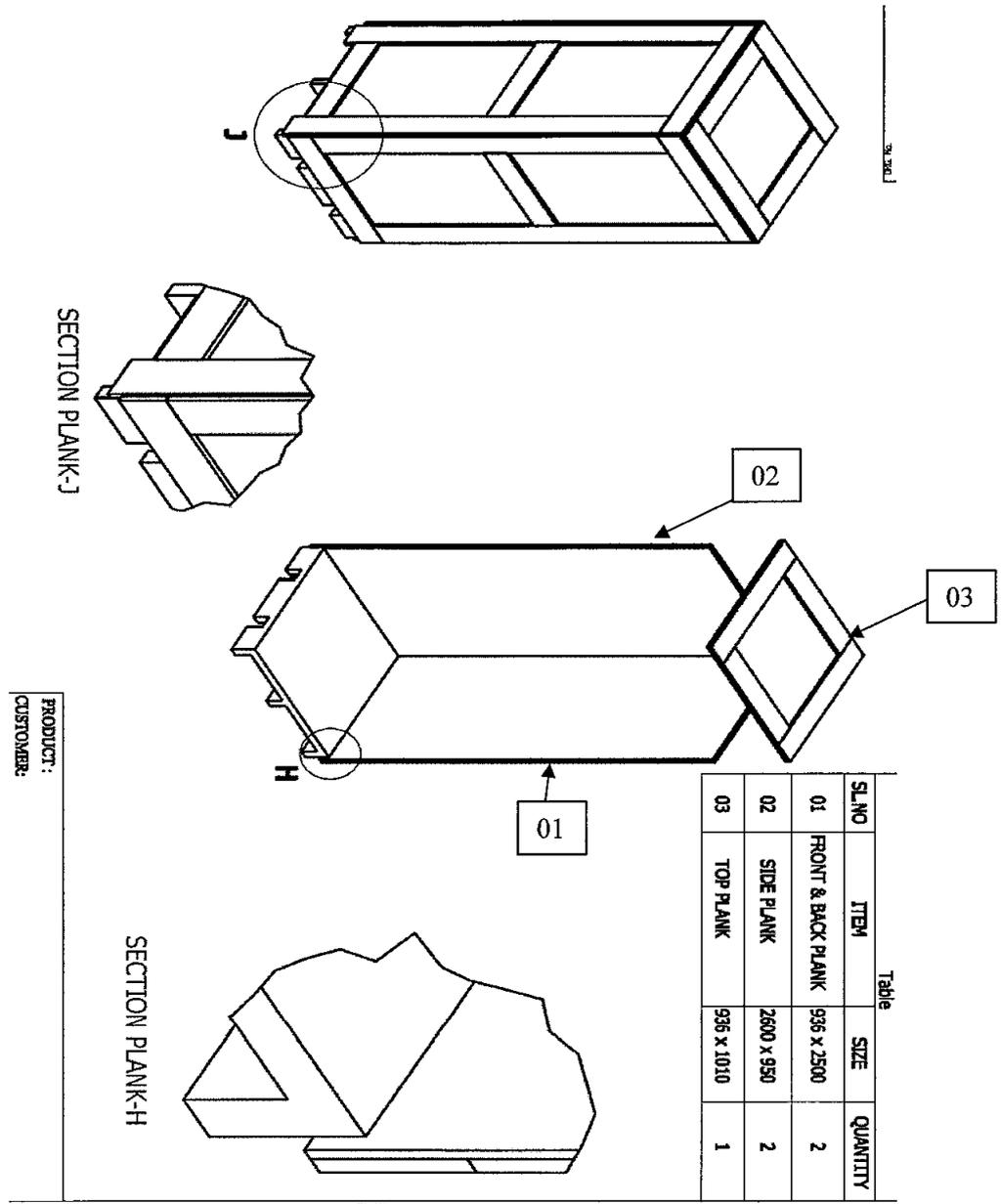
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PRODUCT:
CUSTOMER:

Fig-10 : Plywood Packing for Single Suit Panel.



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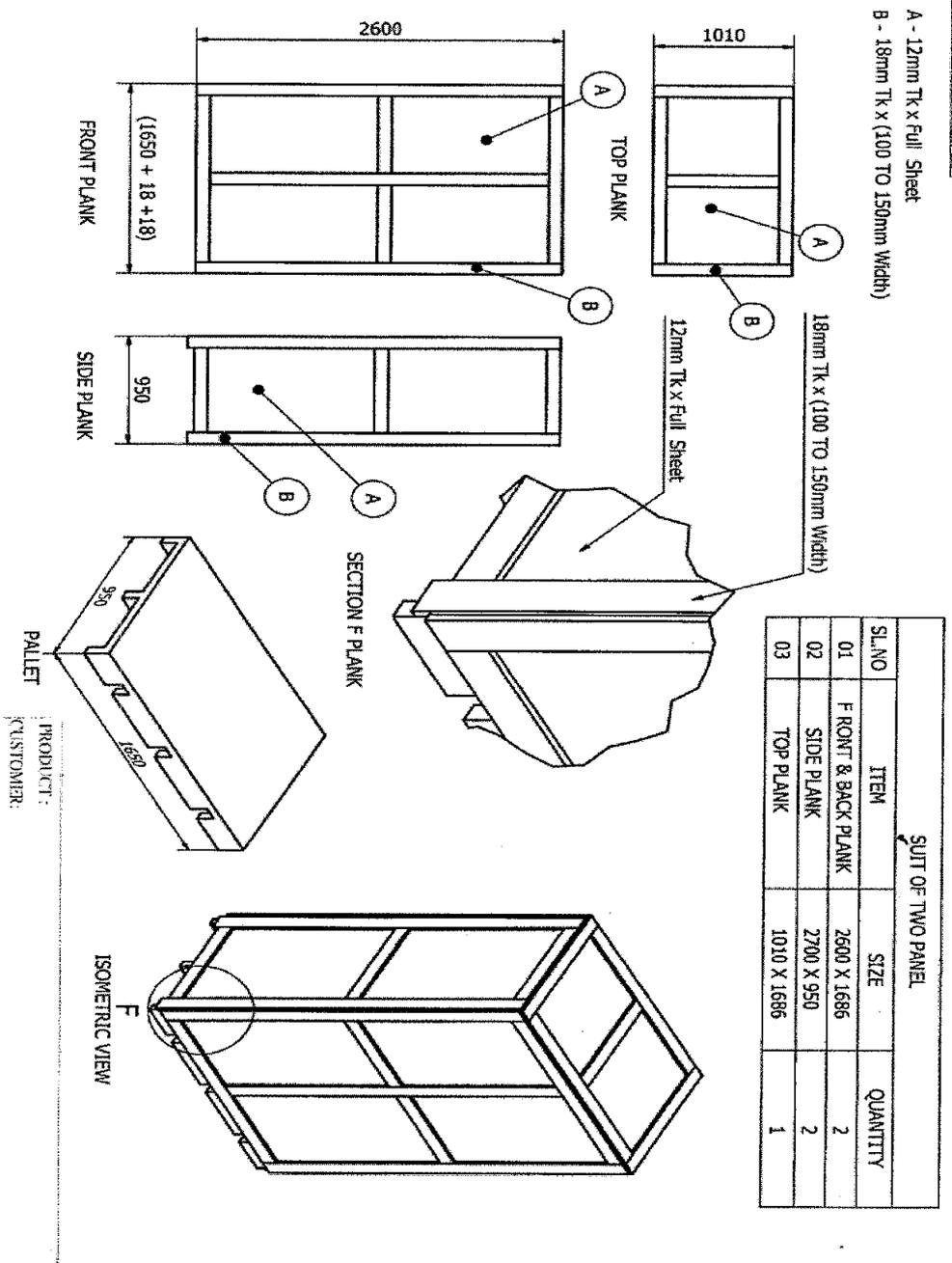


Fig - 11 : Plywood Packing for 2suit panel.



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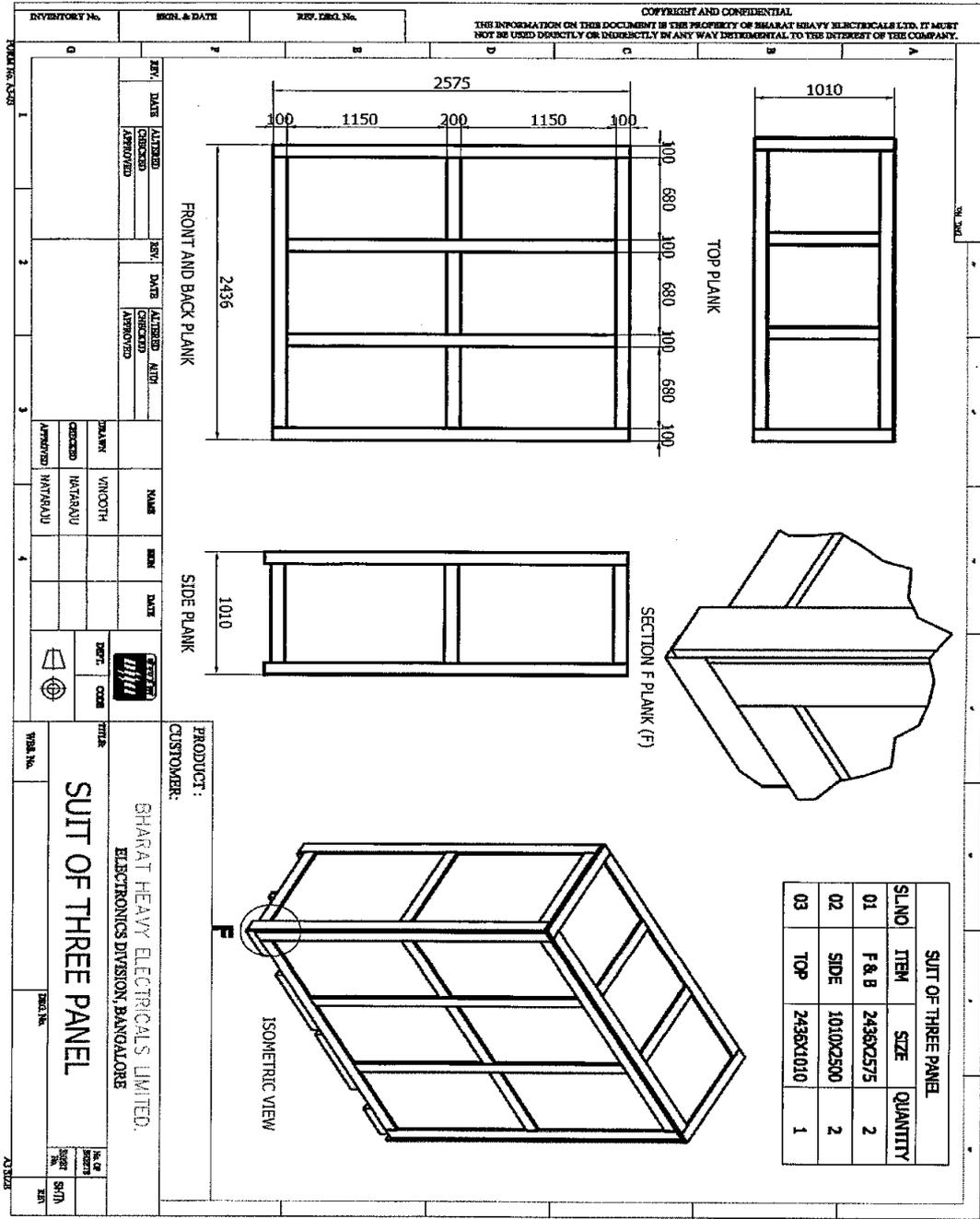


Fig - 12 : Three Suit Panel Packing



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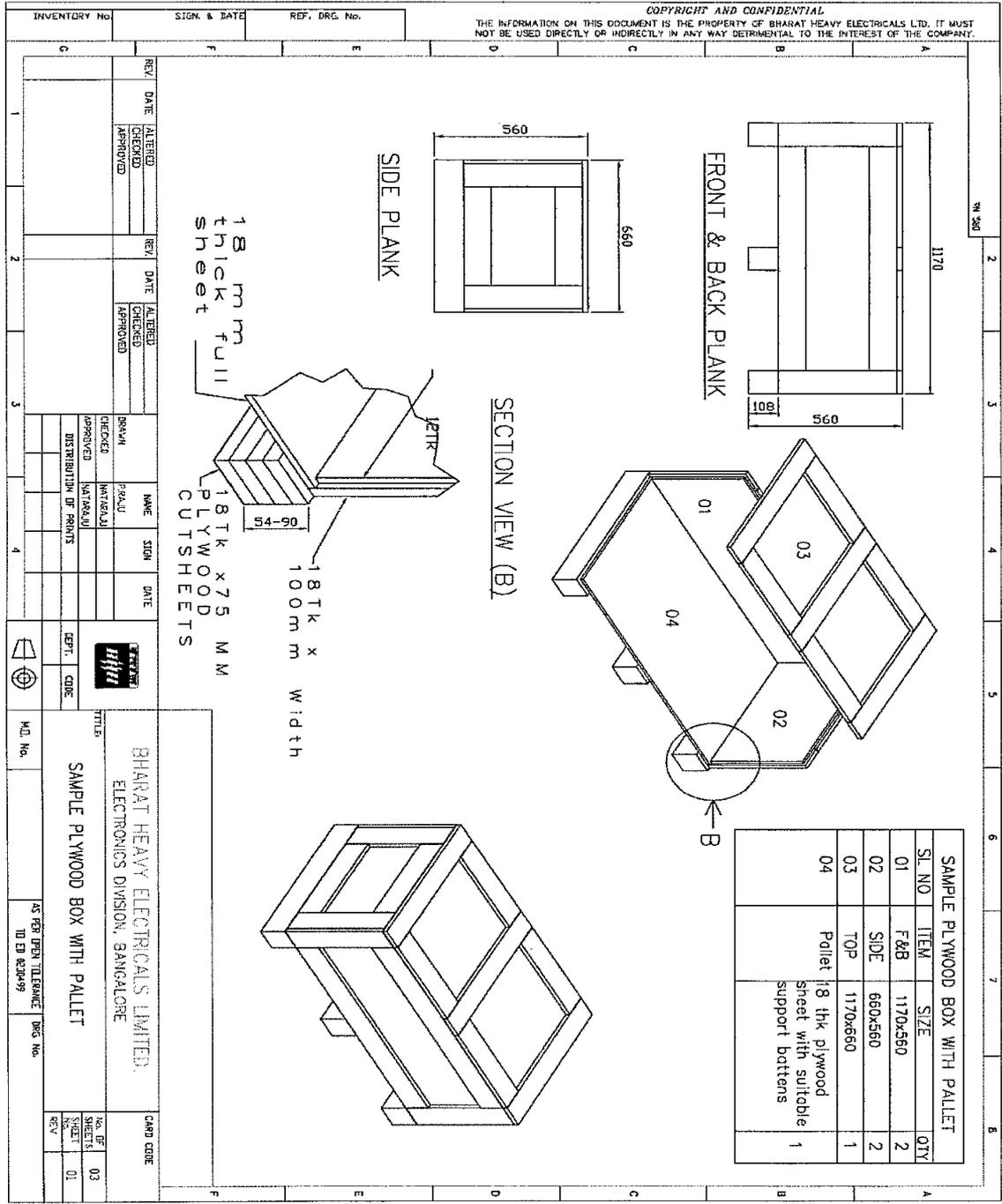


Fig - 13 : Plywood small case with Pallet

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Easy spares [Initial and O&M] Traceability and Identification at units and as well as at sites:

Fig: 14

