



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್  
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Page 1 of 3

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

CE: PR: 003- Rev 01

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 02) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 01).

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: MGR0000305

RFQ Date: 29/05/19 Due Date: 18/06/19

Customer/Project: TSGENCO/ Kothagudem-U#9&10 (2x250 MW) R&M TPP

Item Description: Steam & Water Analysis System (SWAS) for TSGENCO/ Kothagudem-U#9&10 (2x250 MW) R&M TPP project.

TYPE OF BID: ~~SINGLE PART BID / TWO PART BID / THREE PART BID~~

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

[mounishg@bhel.in](mailto:mounishg@bhel.in)

or

[kanimozhid@bhel.in](mailto:kanimozhid@bhel.in)

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

**Destination: a)** For Indigenous scope of supply, items are to be directly despatched to BHEL's site office or Stores located at Kothagudem TPP project site in Telangana State. Detailed Consignee details will be issued by BHEL along with Despatch Clearance.

**b)** For Imported scope of supply, destination is Bangalore port. In case of shipment by sea, port of discharge will be Chennai port, Tamilnadu State, India and port of delivery shall be ICD, Bangalore, Karnataka State, India.

**Note:** To avoid damages during transit, please ensure the packing instruction/standard as indicated in Sections: H & I of technical specification.

**Project Benefits: Imported scope of supply:**

- a) ~~DEEC / SEZ/EPCG/DFIA/ Physical Export contract: Eligible for "NIL" Basic Customs Duty.~~
- b) ~~Project Imports: Eligible for Concessional Basic Customs Duty.~~
- c) ~~Basic Custom duty and Cess on Basic Custom duty are reimbursable by customer.~~

**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 charges:

\_\_\_\_\_

Under-mentioned details shall be provided against indigenous supplies:

a. GSTIN (no.) of place of supply: \_\_\_\_\_

b. HSN (Harmonized System of Nomenclature) code: \_\_\_\_\_

Applicable tax and Rate: \_\_\_\_\_ & \_\_\_\_\_

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

| SL NO. | TERMS                                                                                                                   | BHEL ACCEPTABLE TERM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BIDDER'S CONFIRMATION                                                                                                                                                                | REMARKS,if any |
|--------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 01     | <b>Reverse Auction</b>                                                                                                  | BHEL's decision for opting Reverse Auction or price-bid opening, will be intimated separately to qualified bidders after finalization of techno-commercial evaluation. In case BHEL does not resort to Reverse Auction, the price bids and price impacts (if any) shall be opened as per BHEL's standard practice.<br>Note: Non-acceptance to participate in RA may result in non-consideration of the bid, in case BHEL decides to go for RA.                                                                                                                                                                                                                                                                                                                                                                                                                | <b>AGREE</b>                                                                                                                                                                         |                |
| 02     | <b>Parting of license for imported raw materials</b>                                                                    | <del>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 be passed on to BHEL and confirmed in the quotation. If there are no imported raw materials/components, same shall be confirmed in the offer.</del>                                                                                                                                    | <b>AGREE</b><br><br>CIF value .....<br><br><del>Yes, benefit passed on to BHEL in the priced quotation.</del><br>(or)<br><del>We confirm that there are no imported components</del> |                |
| 03     | <b>Delivery Period</b>                                                                                                  | Within <u>09</u> weeks from the date of issue of Manufacturing clearance along with approved document. However for all shelf-life items (all types of Consumables & Commissioning Spares), delivery shall be within <u>06</u> weeks from the date of accordance of manufacturing clearance by BHEL at the time of commissioning of equipment.<br>Delay in contractual delivery will attract Penalty as per GCC Clause no.:04.b.                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>AGREE</b><br><br>..... weeks                                                                                                                                                      |                |
| 04     | <b>Terms of Payment at the time of material supply</b>                                                                  | Refer Clause "F" of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms:<br><b>Indigenous Scope :</b><br>a) <del>Supply with Erection &amp; Commissioning</del><br>b) Supply with Erection Supervision & Commissioning (For Main supply)<br>c) <del>Supply only</del><br><b>Imported Scope :</b><br>d) <del>Supply with Erection &amp; Commissioning</del><br>e) Supply with Erection Supervision & Commissioning (For Main supply)<br>f) <del>Supply only</del><br><b>High-Sea sales :</b><br>g) <del>Supply with Erection &amp; Commissioning</del><br>h) Supply with Erection Supervision & Commissioning (For Main supply)<br>i) <del>Supply only</del><br><b>Spares and all types of Consumables &amp; Commissioning Spares :</b><br>c) and/or f)/i) depending upon the scope | <b>AGREE</b>                                                                                                                                                                         |                |
| 05     | <b>Please provide Percentage of local content and details of location(s) at which the local value addition is made:</b> | '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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Percentage of local content : _____%</b><br><br><b>Location(s) at which the local value addition is made : _____</b>                                                              |                |

**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 120 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) All types of Consumables & Commissioning Spares are to be arranged for dispatch to project site only after receiving manufacturing clearance from BHEL which will be based on the requirement of these items, as per commissioning schedule of the equipment at project site.
- (4) **Warranty:** 30 months from the date of dispatch of goods or 24 months from the date of commissioning of goods, whichever is earlier. However, Warranty for all types of Consumables & Commissioning Spares is applicable only for a period of 12 months from the date of dispatch of goods.
- (5) **Performance Bank Guarantee (PBG):** PBG will be applicable for a period of 30 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 all types of Consumables & Commissioning 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.
- (6) **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 one or more documents from the following: Invoice (01 original and 01 copy with original sign & seal), Lorry Receipt (L/R), Packing List, NIL Short-Shipment Certificate, insurance intimation letter, Country of origin certificate, Original Performance Bank Guarantee (directly from issuing bank to BHEL) and POD (Proof Of Delivery) on L/R.  
**The precise list of despatch documents needed for the project will be specified in the Purchase Order.**  
One set of Invoice, Packing List and L/R shall be e-mailed immediately to BHEL-EDN after despatch.
- (7) **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.
- (8) **Evaluation criteria for tendered items:**  
Evaluation of the lowest bidder will be done as a combined package. For this procurement, Public procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 08.06.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO against this NIT.
- (9) **Shelf life items:** Items with shelf life i.e., all types of Consumables & Commissioning Spares will be ordered as a separate line item. Bidder to clearly mention any such items explicitly in the offer.
- (10) ~~**Integrity Pact:** Execution of Integrity Pact is applicable for this tender (Refer clause "K" of Instructions to Bidders)~~

Details of IEM for this tender are mentioned below:

Name: \_\_\_\_\_ Address: \_\_\_\_\_ Email: \_\_\_\_\_

**(11) Comprehensive Annual Maintenance Contract:**

CAMC will be applicable for a period of 03 years from the date of expiry of warranty period (or) from the date of completion of commissioning of equipment, whichever is later.

***With this, we hereby confirm that all the terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 02) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 01) are accepted without any deviation.***

**Vendor's Signature with Seal**



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

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE:PR:001- Rev 02

### **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 02), General Conditions of Contract (document reference: CE: PR: 002 - Rev 01) 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](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](http://www.bhel.com) for more details.
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. For this procurement, Public procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO against this NIT.

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

#### **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) upto 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) if applicable, documentation charges, testing Charges (type & routine), training charges etc. as applicable along with corresponding tax. The price summary must indicate all the elements clearly.
10. For Physical Export projects or wherever services are rendered by foreign suppliers in India, 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 web-site 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. BHEL reserves the right to adopt Reverse Auction or standard Price Bid Opening procedure for price evaluation, at its discretion. This shall be decided after completion of techno-commercial evaluation of tender (Refer BHEL website [http://www.bhel.com/vender\\_registration/vender.php](http://www.bhel.com/vender_registration/vender.php) for Guidelines of Reverse Auction). In case BHEL does not resort to Reverse Auction, the price bids and price impacts (if any) already submitted and available with BHEL shall be opened as per BHEL's standard practice.
6. 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.
7. 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.
8. 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.
9. 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.

10. 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.

11. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers.

#### **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. 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:**

| <b><u>PURCHASE ORDERS FOR:</u></b>   | <b><u>SUPPLY WITH ERECTION &amp; COMMISSIONING</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b><u>SUPPLY WITH ERECTION SUPERVISION &amp; COMMISSIONING</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b><u>SUPPLY ONLY</u></b>                                                                                                                                                                        |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>INDIGENOUS PROCUREMENT</u></b> | <p>a. 90% of basic value + 100% of taxes and freight charges 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>Balance 10% of basic value (Retention money) will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&amp;C.</p> <p><u>Note:</u> In case PBG is not furnished, only 80% payment will be released against 90% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p> | <p>b. 95% of the basic value + 100% of taxes and freight charges 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>Balance 5% of basic value (Retention money) will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of commissioning.</p> <p><u>Note:</u> In case PBG is not furnished, only 85% payment will be released against 95% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p> | <p>c. 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> |
| <b><u>IMPORT PROCUREMENT</u></b>     | <p>d. 90% of the basic value will be paid on the 45th day, against usance draft of 45 days, from the date of AWB/BOL on submission of complete set of documents.</p> <p>Balance 10% of basic value (Retention money) will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&amp;C.</p> <p><u>Note:</u> In case PBG is not furnished, only 80% payment will be released against 90% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>                                            | <p>e. 95% of the basic value will be paid on the 45th day, against usance draft of 45 days, from the date of AWB/BOL on submission of complete set of documents.</p> <p>Balance 5% of basic value (Retention money) will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of commissioning.</p> <p><u>Note:</u> In case PBG is not furnished, only 85% payment will be released against 95% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>                                                | <p>f. 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>                                                     |

| <b><u>PURCHASE<br/>ORDERS FOR:</u></b>           | <b><u>SUPPLY WITH ERECTION &amp;<br/>COMMISSIONING</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b><u>SUPPLY WITH ERECTION<br/>SUPERVISION &amp; COMMISSIONING</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b><u>SUPPLY ONLY</u></b>                                                                                                                                                                              |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>HIGH-SEA<br/>SALES<br/>PROCUREMENT</u></b> | <p>g. 90% 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>Balance 10% of basic value (Retention money) will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&amp;C.</p> <p><u>Note:</u> In case PBG is not furnished, only 80% payment will be released against 90% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p> | <p>h. 95% of the 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>Balance 5% of basic value (Retention money) will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of commissioning.</p> <p><u>Note:</u> In case PBG is not furnished, only 85% payment will be released against 95% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p> | <p>i. 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> |

**j. 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 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.

**k. 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.

**l.** 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.

**m.** Standard payment terms indicated in Clauses: F (a), (b), (c), (d), (e), (f), (g), (h), (i), (j) & (k) 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, the retention money will be 10% (where scope includes E&C) or 05% (where scope includes Erection supervision & Commissioning) of both purchase order values put together.

**Note 2:** If the E&C could not be completed till the end of the Warranty period due to reasons not attributable to the supplier, BHEL will release the retention money to the supplier against Bank Guarantee for equivalent value valid for an initial period of one year.

**Note 3:** In case of Physical Export projects or wherever services are rendered by foreign suppliers in India, E&C charges (if quoted separately/extra by bidder) will be paid in 15 days from the date of submission of supplementary invoice/ documents against proof of completion of E&C.

**Note 4:** In case of multiple packages/units in a power plant, payment of retention money/E&C charges will be processed on pro-rata basis.

**Note 5:** 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.

**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 BGs / PBGs will be returned only after expiry of the claim period or on completion of the contractual obligation with respect to Purchase Order.

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 any of the following documents along with the tender documents in the Part-I bid to avail the applicable benefits:

- a. Attested copy of valid NSIC certificate or
- b. Attested copy of either Entrepreneur's Memorandum part II (EM II) certificate/Udyog Aadhar certificate having deemed validity (five years from the date of issue of acknowledgement in EM II/Udyog Aadhar) or
- c. EM II/ Udyog Aadhaar certificate along with attested copy of a CA certificate (Format enclosed at Annexure VIII where deemed validity of EM II certificate/ Udyog Aadhar certificate of five years have expired) applicable for the relevant financial year (latest audited).

Date to be reckoned for determining the deemed validity will be the date of 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.

#### **d. PURCHASE PREFERENCE FOR MSE VENDORS:**

MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 25% of the requirement against this tender provided

1. The MSE vendor matches the L1 price.
2. L1 price is from a non MSE vendor.
3. L1 price will be offered to the vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2), next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
4. 3% of the 25% will be earmarked for women owned MSEs.
5. 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.

6. 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.
7. 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.

| SI | IEM                                      | Address                                                                               | Phone & Email                                                              |
|----|------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 1. | Shri D.R.S Chaudhary,<br>IAS (Retd.)     | E-1/164, Arera Colony<br>Bhopal 462016 (M.P.)                                         | <a href="mailto:dilip.chaudhary@icloud.com">dilip.chaudhary@icloud.com</a> |
| 2. | Mrs. Pravin Tripathi,<br>IA & AS (Retd.) | D-243, Anupam Gardens,<br>Lane IB, Neb Sarai,<br>Sainik Farms,<br>New Delhi – 110 068 | <a href="mailto:pravin.tripathi@gmail.com">pravin.tripathi@gmail.com</a>   |

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

- 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 IEMs shall be done through email only.

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

- i. 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.
- ii. 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.
- iii. 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.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- vi. 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.
- vii. 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](http://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.

**Annexure-VI**

**BHEL MEMBER BANKS (LIST OF CONSORTIUM BANKS)**

**BANK GUARANTEE (BG) SHALL BE ISSUED FROM THE FOLLOWING BANKS ONLY:**

|    | <b>Nationalised Banks</b> |    | <b>Nationalised Banks</b>                                 |
|----|---------------------------|----|-----------------------------------------------------------|
| 1  | Allahabad Bank            | 19 | Vijaya Bank                                               |
| 2  | Andhra Bank               |    | <b>Public Sector Banks</b>                                |
| 3  | Bank of Baroda            | 20 | IDBI                                                      |
| 4  | Canara Bank               |    | <b>Foreign Banks</b>                                      |
| 5  | Corporation Bank          | 21 | CITI Bank N.A                                             |
| 6  | Central Bank              | 22 | Deutsche Bank AG                                          |
| 7  | Indian Bank               | 23 | The Hongkong and Shanghai Banking Corporation Ltd. (HSBC) |
| 8  | Indian Overseas Bank      | 24 | Standard Chartered Bank                                   |
| 9  | Oriental Bank of Commerce | 25 | J P Morgan                                                |
| 10 | Punjab National Bank      |    |                                                           |
| 11 | Punjab & Sindh Bank       |    | <b>Private Banks</b>                                      |
| 12 | State Bank of India       | 26 | Axis Bank                                                 |
| 13 | State Bank of Hyderabad   | 27 | The Federal Bank Limited                                  |
| 14 | Syndicate Bank            | 28 | HDFC Bank                                                 |
| 15 | State Bank of Travancore  | 29 | Kotak Mahindra Bank Ltd                                   |
| 16 | UCO Bank                  | 30 | ICICI Bank                                                |
| 17 | Union Bank of India       | 31 | IndusInd Bank                                             |
| 18 | United Bank of India      | 32 | 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 to 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 \_\_\_\_\_<sup>1</sup> through its Unit at.....(name of the Unit) having awarded to ( Name of the Vendor / Contractor / Supplier) with its registered office at \_\_\_\_\_<sup>2</sup> 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.....dated .....<sup>3</sup> valued at Rs.....<sup>4</sup> ( Rupees -----)/FC.....(in words.....) for .....<sup>5</sup> (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 -- .....<sup>6</sup> ( 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 the .....bank 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.

We .....BANK 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.....<sup>7</sup> 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 the .....<sup>8</sup>we 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.....<sup>6</sup>
- b) This Guarantee shall be valid up to .....<sup>7</sup>
- c) Unless the Bank is served a written claim or demand on or before .....<sup>8</sup> 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.....

<sup>1</sup> NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

<sup>2</sup> NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

<sup>3</sup> DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

<sup>4</sup> CONTRACT VALUE

<sup>5</sup> PROJECT/SUPPLY DETAILS

<sup>6</sup> BG AMOUNT IN FIGURES AND WORDS

<sup>7</sup> VALIDITY DATE

<sup>8</sup> DATE OF EXPIRY OF CLAIM PERIOD

---

**Annexure – VIII**  
**(Applicable only for MSE suppliers)**  
**Certificate by Chartered Accountant on Letter Head**

This is to certify that M/s .....  
.....(hereinafter referred to as 'Company')  
having its registered office at ..... is registered under MSMED Act 2006,  
(Entrepreneur Memorandum No (Part-11 ..... dtd .....  
Category: ..... (Micro/Small) (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as  
per the latest audited financial year..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery ( i.e. original  
cost excluding land and building and the items specified by the Ministry of Small  
Scale Industries vide its notification No.S.O.1722 (E) dated October 5, 2006:  
Rs.....Lacs.
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and  
building and furniture, fittings and other items not directly related to the service  
rendered or as may be notified under the MSMED Act, 2006:  
Rs. ....Lacs.

The above investment of Rs. ....Lacs in within permissible limit of  
Rs.....Lacs for.....Micro / Small (Strike off which is not  
applicable ) Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/ Small) (**Strike off which is  
not applicable**) and the date of graduation of such enterprise from its original category is  
..... (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of  
such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013  
published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name:

Membership Number:

Seal of Chartered Accountant

## **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 IPC/ PC 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 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.

### **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 Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 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 /Sub-contractors**

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.
- 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 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC 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.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word 'Monitor' would include both singular and plural.

### **Section 9 – Pact Duration**

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as 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

(Office Seal)

Place-----

Date-----

Witness: \_\_\_\_\_

(Name & Address) \_\_\_\_\_  
\_\_\_\_\_

-----  
For & On behalf of the Bidder/ Contractor

(Office Seal)

Witness: \_\_\_\_\_

(Name & Address) \_\_\_\_\_  
\_\_\_\_\_



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 01

#### **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.  
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.

A handwritten signature in black ink, appearing to read "J.ounish". The signature is written in a cursive, flowing style with a large initial 'J'.

|                                                                                                                                                                                                                                                    |  |                                                                                                                                                                     |                                                                                                |                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                    |  | <br>A4 - 10                                                                        | <div>REF. : CE/416/KOTHGUDEM/SWAS/PS</div> <div>REV. NO. : 00</div> <div>PAGE : 01 OF 02</div> |                                                                                                                            |
|                                                                                                                                                                                                                                                    |  | <p>PROJECT :- KOTHAGUDEM - 2 X 250 MW TPS R&amp;M</p> <p>CUSTOMER :- TSGENCO</p> <p><b>PURCHASE SPECIFICATION<br/>FOR<br/>STEAM &amp; WATER ANALYSIS SYSTEM</b></p> |                                                                                                |                                                                                                                            |
| <div>COPY RIGHT AND CONFIDENTIAL</div> <div>THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICAL LIMITED.</div> <div>IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY</div> |  | REVISIONS :                                                                                                                                                         |                                                                                                | APPROVED                                                                                                                   |
|                                                                                                                                                                                                                                                    |  |                                                                                                                                                                     |                                                                                                | <br>( Punit P Singh )                 |
|                                                                                                                                                                                                                                                    |  |                                                                                                                                                                     |                                                                                                | <div>PREPARED</div> <div><br/>PRK</div> |

## CONTENTS

| SECTION | DESCRIPTION                                        |
|---------|----------------------------------------------------|
| A       | GENERAL INSTRUCTIONS                               |
| B       | PRE-QUALIFICATION REQUIREMENTS                     |
| C       | SCOPE OF SUPPLY                                    |
| D       | TECHNICAL REQUIREMENTS AND ANALYSER SPECIFICATIONS |
| E       | SWAS SCHEMES                                       |
| F       | QUALITY CHECKLISTS                                 |
| G       | APPROVED VENDOR LIST                               |
| H       | PACKING INSTRUCTION FOR ANALYSERS and Spares       |
| I       | PACKING STANDARD FOR SAMPLE HANDLING SYSTEM        |

## **SECTION- A**

### **GENERAL INSTRUCTIONS TO BIDDERS:**

All required documents against this Tender/Specification shall be submitted in English only.

Introduction: Bidders are required to offer SWAS to be used in Power Plant applications.

In order to accept the Technical offers / proposals from Bidders for the project mentioned in this Specification (refer Sections C, D, E, F, G, H & I), certain Pre-qualification criteria are required to be met by Bidder.

Pre-qualification requirements are clearly mentioned in AA of Section-B of this Specification. Bidder to read the same carefully and submit the details/documents 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.

**Evaluation methodology:** BHEL shall initially open Bidder's PQR documents as per Section-B of this specification for review & acceptance. Only after acceptance of PQR documents, BHEL shall open Bidder's technical offers for evaluation. Technically acceptable vendors will be proposed to customer / End user for vendor approval. Commercial bids of only accepted/approved vendors by End users/Customers, shall be considered by BHEL for further processing.

Bidders are required to submit offers as detailed below:

- A. Documents pertaining to Pre-Qualification requirements for Clause AA of Section-B along with point-wise compliance to be uploaded as Part-I Bid.
- B. Technical offers/proposals for the Project, whose requirements are mentioned in Sections C & D to be submitted along with point-wise compliance and uploaded as Part-II Bid.

Note 1:-Whenever required during evaluation of PQR and Technical offers/bids, vendor is required to be present at BHEL Electronic Division, Bangalore, for discussions. Further in the event of order, during approval of the Vendor documents by End users/Customers, Vendor shall accompany BHEL representative for discussions.

Note 2:- Technical clarifications w.r.t specifications (if any) shall be discussed with only those vendors who quote for this tender. Bidder shall furnish Clause-wise compliance / deviation list along with the offer, which is mandatory for evaluating the offer. The deviations to be clearly mentioned in the offer and acceptance of these deviations will be subject to customer approval. If Bidder incurs any additional cost for the withdrawal of any deviation, the same shall be borne by the bidder without any cost implication to BHEL.

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## **SECTION- B**

### **AA. Pre-Qualification Requirements (PQR) of Bidders for SWAS:**

1. “Bidder shall have successfully completed design, engineering, procurement, manufacturing, shop testing, erection and commissioning of SWAS, which had guaranteed and trouble free performance has been proven at least for 1(One) year as on bid opening date of this tender, in a Powerplant of min. 200 MW and above”. To qualify to this point, bidder to submit the performance certificate from the End users.
2. Original Equipment (Sample Handling System) Manufacturers based outside India, who are making offer for this tender shall have authorized representatives in India for support related to Documentation, Erection, Commissioning & post commissioning services. The Indian representative should have the team of experienced service engineers on payroll. Not Applicable for Indian SHS Manufacturers.
3. For bidder/OEM/System Integrator offering upgraded / latest models of various analysers, PQR of equivalent previous model is acceptable subject to meeting PQR indicated in the above clause AA.1.  
In such cases OEM shall certify that offered model is upgraded version of previous model. Confirmation from bidder/OEM/System Integrator is required.
4. Analysers / SHS OEM shall furnish an undertaking that in case of change in Indian representative / agent / System Integrator, OEM shall continue to support supplies made by previous representatives/agents / System Integrator w.r.t to field service and supply of spare parts.
5. In case Customer/End user does not accept the offered makes of analysers, bidders offers will be acceptable only if they agree to supply Analysers of customer approved make of Analysers without any commercial implications to BHEL.

#### **Note:**

1. BHEL shall submit credentials/details furnished by Bidder (SHS/System Integrator) vendor with their offers to customer and await customer’s decision for a maximum of one month from the date of PQ bid opening. If approval is not received within above period, BHEL shall treat the offer as “Not Meeting PQ” criteria and offer shall be rejected. Confirmation from bidder is required.
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2. In case Bidder does not submit details mentioned in above clauses (AA) or meet the requirements of Pre-qualification requirements (AA), 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.
-



A4 - 11

REF. : KOTHAGUEDEM/416/SWAS/SOS

REV. NO. : 00

PAGE : 01 OF 03

PROJECT :- KOTHAGUEDEM - 2 X 250 MW TPS R&M

CUSTOMER :- TSGENCO

## SECTION -C

## SCOPE OF SUPPLY

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

REVISIONS :

APPROVED

( Punit P Singh )

PREPARED

ISSUED

DATE

PRK

416

22-05-2019

SECTION C

KOTHAGUDEM/416/SWAS/SOS



SCOPE OF SUPPLY FOR KOTHAGUDEM R&M UNIT 9 AND 10 2X250 MW

| SL NO | ITEM DESCRIPTION                                                                                                                                                                                                                                    | UNITS | QTY PER SET | TOTAL QTY |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|-----------|
| 1     | <b>SAMPLE HANDLING SYSTEM -</b>                                                                                                                                                                                                                     |       |             |           |
| a     | PRIMARY RACK (With IBR certified Isolation & IBR certified Blowdown Valves & IBR certified Cooler Coils of Inconel material ) .                                                                                                                     | NO.   | 1           | 2         |
| b     | WET RACK - OPEN TYPE RACK                                                                                                                                                                                                                           | NO.   | 1           | 2         |
| c     | DRY PANEL                                                                                                                                                                                                                                           | NO.   | 1           | 2         |
| 2     | <b>ANALYSERS - MICROPROCESSOR BASED WITH DIGITAL COMMUNICATION FACILITY RS485 on Modbus protocol shall be provided to all the Analysers and 2x4-20 mA Analog output</b>                                                                             |       |             |           |
| a     | CONDUCTIVITY(SPECIFIC, CATION) ANALYSER - SINGLE CHANNEL                                                                                                                                                                                            | NOS.  | 11          | 22        |
| b     | pH ANALYSER- SINGLE CHANNEL                                                                                                                                                                                                                         | NO    | 6           | 12        |
| c     | DISSOLVED OXYGEN ANALYSER- SINGLE CHANNEL                                                                                                                                                                                                           | NOS.  | 2           | 4         |
| d     | SILICA ANALYSER (MULTI CHANNEL- 2 CHANNEL)                                                                                                                                                                                                          | NO    | 2           | 4         |
| e     | HYDRAZINE ANALYSER - SINGLE CHANNEL                                                                                                                                                                                                                 | NO    | 2           | 4         |
| f     | CHLORIDE ANALYSER                                                                                                                                                                                                                                   | NO    | 1           | 2         |
| g     | Sodium Analyser with For DM Plant Application - with suitable individual sampling accessories and Individual Mounting racks/panels                                                                                                                  | NO    | 3           | 3         |
| h     | Silica Analyser with Mounting Accessories For DM Plant Application - with suitable individual sampling accessories and Individual Mounting racks/panels                                                                                             | NO    | 1           | 1         |
|       |                                                                                                                                                                                                                                                     |       |             |           |
| 3     | LOOSE SUPPLY ITEMS AS PER ANNEXURE-A                                                                                                                                                                                                                | ST    | 1           | 2         |
| 4     | MANDATORY SPARES AS PER ANNEXURE - B                                                                                                                                                                                                                | ST    | 1           | 1         |
| 5     | COMMISSIONING SPARES- Reagents / Calibrators/Dynamic Calibrators / Standard Solution as required for commissioning & Handing over of System to Owner                                                                                                | ST    | 1           | 2         |
| 6     | CONSUMABLES OTHER THAN CHEMICAL REAGENTS LIKE PH CELL , DO Sensors ,ETC                                                                                                                                                                             | ST    | 1           | 2         |
| 7     | CONSUMABLES I.E. CHEMICAL REAGENTS FOR 1 YEAR OPERATION                                                                                                                                                                                             | ST    | 1           | 2         |
| 8     | O & M MANUALS / DOCUMENTATION CHARGES                                                                                                                                                                                                               | LOT   | 1           | 2         |
| 9     | TEST, CALIBRATION & GUARANTEE CERTIFICATES AS PER APPROVED QUALITY CHECKLIST/ PLAN                                                                                                                                                                  | LOT   | 1           | 2         |
| 10    | SUPERVISION OF ERECTION, TOTAL COMMISSIONING AND HANDING OVER OF SWAS SYSTEM                                                                                                                                                                        | ST    | 1           | 2         |
| 11    | Price for one line of High Pressure & High Temp. - Primary & Secondary cooling to be considered along with other instruments as per P&ID applicable for the project.                                                                                | ST    | 1           | 1         |
| 12    | Price for one line of Low Pressure & Low Temp. - Secondary cooling to be considered along with other instruments as per P&ID applicable for the project.                                                                                            | ST    | 1           | 1         |
| 13    | Vendor has to visit site for verification of inputs for each and every application / service to be cross checked and verified at site after placement of PO / before submission of datasheets.                                                      | ST    | 1           | 1         |
| 14    | Following activities will be in Vendor's scope :-                                                                                                                                                                                                   |       |             |           |
|       | i. Supervision of erection, Total commissioning & Handing over of the system to the End user.Vendor to carry all required calibrators/ dynamic calibration kits (as applicable) for commissioning for analysers and their handing over to customer. |       |             |           |
|       | ii. Erection of inter connecting cabling / tubing between wet & dry panel etc.                                                                                                                                                                      |       |             |           |
| 15    | Note:-                                                                                                                                                                                                                                              |       |             |           |
|       | 1.0 Vendors to quote unit rates for all above items individually.                                                                                                                                                                                   |       |             |           |
|       | 2.0 Vendors who do not quote prices as per pt. 1.0, shall be disqualified.                                                                                                                                                                          |       |             |           |
|       | 3.0 BHEL shall use unit rates indicated above for quantity addition/deletion required during execution.                                                                                                                                             |       |             |           |
|       | 4.0 Bidders to quote item wise prices for all the items indicated above. Evaluation for L1 shall be done considering offered prices for all items indicated above however Items in sl. No.12, and 13 shall be ordered only if required.             |       |             |           |

## ANNEXURE - "A"

### LOOSE SUPPLY ITEMS FOR SWAS

| SL. NO | DESCRIPTION                                                                                                                        | QTY / UNIT     |
|--------|------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1      | Power Cable to SWAS panels                                                                                                         | 25 Meter       |
| 2      | Special Cables between wet and dry panel . (for each cell / analyser Combination)                                                  | 30 Meter/ run  |
| 3      | All cabling and Tubing(along with connection fittings) between wet and dry panel                                                   | 30 Meter / run |
| 4      | Cooling water header, A 106 Gr. B, 2 " NB Sch 40 (between nearest tapping point & wet panel )+ Elbows (20 Nos) and Bends(10 Nos) . | 60 Meter       |
| 5      | Blow down header(Wet Panel) , A 106 Gr. B, 2" NB SCH 40 + Elbows (3 nos.)                                                          | 20 Meter       |
| 6      | Blow down header (Primary Racks) , SS 304 , 2" NB SCH 80 + Elbows (3 Nos)                                                          | 20 Meter       |
| 7      | Recoverable drain header , SS 316 , 2" NB SCH 40 + Elbows ( 3 Nos. )                                                               | 20 Meter       |
| 8      | Waste Drain header (analyser Panel) A 106 Gr. B , 2" NB SCH 40 + Elbows ( 6 Nos. )                                                 | 30 Meter       |
| 9      | Waste drain header( Primary Racks)) , A 106 Gr. B , 2" NB SCH 40 + Elbows ( 3 Nos)                                                 | 30 Meter       |
| 10     | Waste drain header (wet panel ) , A 106 Gr. B , 2" NB SCH 40 + Elbows ( 3 Nos)                                                     | 20 Meter       |
|        |                                                                                                                                    |                |
|        |                                                                                                                                    |                |
|        |                                                                                                                                    |                |
|        |                                                                                                                                    |                |
|        |                                                                                                                                    |                |
|        |                                                                                                                                    |                |
|        |                                                                                                                                    |                |

Note :-

1.0 Vendors to quote unit rates for all items individually.

2.0 Vendors who do not quote prices as per pt. 1, shall be disqualified.

3.0 BHEL shall use unit rates indicated above for quantity addition/deletion required during execution.

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**4.0 In addition to the set of flanges(mating & counter) which is mounted on the header in panel/rack , vendors to consider one additional set of mating & counter flanges for all headers,as indicated above.**

**5.0 For Tubing between wet and dry panel suitable connectors shall be provided.**

## **ANNEXURE - "B"**

### **MANDATORY SPARES FOR SWAS**

| <b>SL. NO</b> | <b>DESCRIPTION</b>                                                        | <b>TOTAL QTY</b>                                                                                                               |
|---------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>1.0</b>    | <b>ANALYSERS(covering all type of analysers)</b>                          |                                                                                                                                |
| <b>a.</b>     | <b>Sensors/Cells for Analysers</b>                                        | <b>10 % of total project qty or minimum 1 no.,whichever is more for each type of analyser(covering all type of analysers)</b>  |
| <b>b.</b>     | <b>Electronic modules/cards of each type</b>                              | <b>10 % of total project qty or minimum 1 no. ,whichever is more for each type of analyser(covering all type of analysers)</b> |
| <b>2.0</b>    | <b>Sampling system accessories</b>                                        |                                                                                                                                |
| <b>a.</b>     | <b>Complete cooler assemblies ( primary &amp; secondary)</b>              | <b>10% of total project qty or minimum 1 no. whichever is more- each type</b>                                                  |
| <b>b.</b>     | <b>High pressure reducing valve.</b>                                      | <b>10% of total project qty or minimum 1 no. whichever is more- each type</b>                                                  |
| <b>c.</b>     | <b>Back pressure regulating valve.</b>                                    | <b>10% of total project qty or minimum 1 no. whichever is more- each type</b>                                                  |
| <b>d.</b>     | <b>Temp. switch , Flow switch, Temp gauge, Pressure gauge , rotameter</b> | <b>10% of total project qty or minimum 1 no. whichever is more- each type</b>                                                  |
| <b>f.</b>     | <b>Sample isolation/ blowdown valve</b>                                   | <b>10% of total project qty or minimum 1 no. whichever is more- each type</b>                                                  |
| <b>g.</b>     | <b>Solenoid valve</b>                                                     | <b>10% of total project qty or minimum 1 no. whichever is more- each type</b>                                                  |

**SECTION -D**

**TECHNICAL REQUIREMENTS &  
ANALYSER SPECIFICATIONS**

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A4 - 11

REF : CE/416/KOTHAGUEDEM/R&amp;M/SWAS/PS

REV. NO. : 00

PAGE : 02 OF 16

## STEAM AND WATER ANALYSIS SYSTEM (SWAS)

### 1.0.0 GENERAL REQUIREMENTS

- 1.1.1. The sampling system shall obtain samples from steam and water system, which shall be adequately conditioned and fed to analysers for continuous, analysis and provide parallel facility for grab sampling as specified.

The analyser outputs shall be used for providing:

- a. Two galvanically isolated linear analog outputs of 4-20 mA, DC for each parameter provided for monitoring in DDCMIS. For multirange analyser, output going to DDCMIS shall correspond to only one range of analyser. Suitable contact output of the analyser range selector switch shall be provided to inhibit the output while the range selector switch is changed from one range to the other. For multichannel analysers, isolated outputs from each channel should be available for DDCMIS. This signal shall be held at the last value while the channel is not active.
- b. Alarm all significant parameters measurements which exceed their permissible limits, with repeat facility in the Central Control Room in the form of potential free contacts.

This will enable the plant chemist and operators either to make adjustments in the water and steam conditioning system or to modify plant operating procedure so as to minimize equipment damage due to corrosion, scaling etc.

- 1.1.2. The Bidder shall furnish all items including conductivity cells, pH cells, monitors, all other analysers, sample conditioning components and other devices as specified in the approved P & I Diagram, sample stream specification, and other applicable documents forming a part of this specification. The Bidder shall furnish all required accessories for completeness of the analysers furnished by him even though this may not be specifically stated in other clauses of this specification.

- 1.1.3. The system shall be furnished complete with all accessories, sample conditioning devices and monitoring instruments (for temperature, pressure, flow), analysers, transmitters, controllers, computing devices, function generators, recorders, alarm initiating devices, interlocks and all required accessories to provide a complete and integrated sampling & analysis system as per the intent & requirements of this specification. Sample line diagram shall be used to implement the design at system level which shall be subject to Owner's approval. All necessary piping, tubing, fittings and valves etc. shall be furnished by the Bidder.

Also, MICROPROCESSOR BASED WITH DIGITAL COMMUNICATION FACILITY RS485 on Modbus protocol shall be provided to all the Analysers



A4 - 11

REF : CE/416/KOTHAGUEDEM/R&M/SWAS/PS

REV. NO. : 00

PAGE : 03 OF 16

- 1.1.4. The system shall be designed in accordance with the recommendations in ASME PTC 19.11 Part II, Water and Steam in Power Cycle.
- 1.1.5. The Bidder shall be fully responsible on system basis, for proper engineering, selection of hardware, manufacture, testing, installation, commissioning and satisfactory functioning of complete and fully operational Steam & Water Analysis System, meeting the intent of this specification. All system components and accessories required for required for completeness of this system shall be furnished by the Bidder although these may not be individually specified herein.
- 1.1.6. All system components shall be completely assembled, piped, wired and tested at the factory ready for installation when received at the project site.
- 1.1.7. The equipment shall be constructed to operate accurately and safely under the operating conditions described or implied in this specification, without undue heating, vibration, wear, corrosion or other operating troubles.
- 1.1.8. All parts subject to high pressure or temperature or other severe duty shall be of materials suitable for the service.
- 1.1.9. All piping, tubing, fittings and other wetted parts in the sampling and analysing system shall be of type 316 stainless steel No plastics or rubber shall be permitted except within analysers as furnished by the manufacturer.
- 1.1.10. All SWAS system components and accessories shall be from the latest proven product range of qualified manufacturers. The SWAS components and accessories shall be of Owner approved makes and models, fully meeting the qualifying requirements.
- 1.1.11. a) Sample room located instruments & electronic hardware will be required to operate normally in an air conditioned area as of Specification. However , they shall also be able to operate with ambient room temperature between 4°C - 50°C and relative humidity upto 95%, during air conditioning failure.

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C O P



The following plant services would be made available by Owner for operation of the system.

- a) Electric Power Supply:
  - i) 240 V AC UPS for Analysers.
- b) Auxiliary Cooling Water Supply. (for both Primay and Wet Rack)  
10,000 Ltr/Hr for Primary Racks and 10,000 Ltr/Hr for Wet Panel

#### 1.2.1 SAMPLE CONDITIONING SYSTEM

##### GENERAL

- 1) Sample conditioning shall be designed and constructed to fully meet the intent and requirements of this specification.
- 2) The sample conditioning system shall provide samples at 25°C or a preset temperature required by the analyser within tolerance of  $\pm 1^\circ\text{C}$ , at a pressure of about 2 kg/cm<sup>2</sup> and at flow rates as required by individual analysers/streams.
- 3) Sample line to analyser elements shall incorporate an anti - syphon design to prevent possibility of running dry because of a broken or plugged sample line.
- 4) Sample conditioning system shall be designed and constructed to receive & condition all samples ( listed in the enclosed Sample Stream Specification ) as required by the respective analysers connected to the sample streams. This will include all conditioning as specified herein and shall cover the followings:
  - a) Primary sample cooling (wherever required) in the field.
  - b) High pressure reduction (wherever required) in the field.
  - c) Racks shall be provided per unit by the Bidder for mounting primary coolers and high pressure reducing elements in the field alongwith all required piping, fittings, accessories. The exact grouping & location of these racks shall be as finalised during detail engineering stage. The Bidder shall furnish the unit price of these racks alongwith the offer.
  - d) Sample filtering.
  - e) Secondary sample cooling and temperature control.
  - f) Pressure reduction and control as required.
  - g) Flow rate control and measurement.
  - h) Other treatment as required by individual analysers or as specified herein.
  - i) Wherever the panels/racks are painted, the painting shall be corrosion proof, epoxy based paint. Paint shall be specified during detailed engineering.  
The paint thickness shall be 100 to 150 microns.



A4 - 11

REF: CE/416/KOTHAGUDEM/R&M/SWAS/PS

REV. NO. : 00

PAGE : 05 OF 16

#### 1.2.2. WET & DRY PANEL :

- Wet & Dry panel shall be constructed from 2.5 mm thick structural steel (doors - 2mm) and shall be provided with adequate no. of quick start LED lamps.  
Antivibration pads of about 15 mm to be provided for each panel.
- Both Wet & Dry panel shall be designed to provide for easy accessibility to mountings & fittings, piping & wiring in the panel.
- Wet panel shall be open type rack with easy accessibility for mounted instrumentation for maintenance purpose. Rack shall be furnished with ISMC 100 angle as base for mounting.
- Dry panel shall be free standing ,enclosed type panel with back doors
- Junction Boxes for both Wet & Dry Panels shall be provided with extra spare terminals, about 25% of used terminals in the junction box. The terminals shall be Cage clamp type.
- All bulk heads in wet panel shall suit the sample pipes from field

#### 1.2.3. PRIMARY SAMPLE COOLER

- 1) Primary cooling of all samples of temperature in excess of 45°C shall be accomplished by passing each sample through an individual sample cooler of heat exchanger type located in the field as specified below. The design, construction materials & technical features of the cooler shall be subject to Owner's approval.
- 2) The primary cooler shall use condensate quality plant auxiliary cooling water. Cooling water shall be supplied from Owner's closed cooling water system at a maximum temperature of 40°C and a maximum flow rate of 150 litres per minute. For cooling water circuit, the maximum allowable pressure drop across Owner's auxiliary cooling water supply terminals shall be limited to 0.7 kg/cm<sup>2</sup> with the maximum inlet pressure of 2.5 kg/cm<sup>2</sup>.
- 3) The capacity (flow rate and heat transfer capacity) for both sides of cooling water inlet temperature for the combined flows of each required analyser sample plus a manual grab sample flow rate of 500 ml/min, assuming a fouling factor of 0.2 on both sided of the tube. The capacity calculation shall be submitted by the Bidder along with the proposal and shall be subject to Owner's approval.



- 4) Sample coolers shall be of submerged helical coil type of shell and tube design with removable shell meeting the intent of ASTM D 1192-1977.
- Sample tubing and coils in the coolers shall be continuous and shall extend through the cooling jackets. The sample tubing shall be of seamless type with no welded or other joints inside the cooling jacket. Unions shall be provided to facilitate removal of coils. Sample cooler of coil shaped (tube in tube) design is not acceptable.
- 5) All sample tubing, fittings and other components wetted by the samples shall be constructed of Inconel material. The shell and the other components shall be stainless steel or other material approved by the Owner.
- 6) Primary cooler shall be removable without disturbing the sample connections allowing test and inspection at full sample pressure.
- 7) Primary cooler shall be protected by a relief valve on the cooling water jacket of each cooler in addition with a relief valve at the cooling water header. Further the cooling water header shall be provided with pressure gauge, flow gauge, temperature gauge, flow switches and isolating valve as shown in P&ID.
- 8) Provision shall be made for heat exchanger shell drain which will be valved and piped to waste drain header to be supplied by the Bidder.
- 9) Flow switches as indicated above shall be provided in the cooling water line for loss of cooling water flow annunciation.
- 10) Pressure gauge, Temperature Gauge, Flow Switch as shown in enclosed schematics shall be supplied along with all necessary accessories. Vendor shall also mount the item at site.

#### 1.2.4 HIGH PRESSURE REDUCTION

All high pressure samples ( $P > 100 \text{ kg/cm}^2$ ) shall be provided with high pressure reducing valve in the field after primary cooler. After primary sample cooling and pressure reduction the sample shall be brought to the SWAS Panel like all other samples. High pressure reducing valve shall be suitable for 400 bar-operating pressure and  $200^\circ\text{C}$  operating temperature. These valves shall have renewable valve seat & stellite spindle tip as minimum. Make and model of high pressure reducing valve shall be subjected to Owner's approval.



A4 - 11

REF : CE/416/KOTHAGUDEM/R&amp;M/SWAS/PS

REV. NO. : 00

PAGE : 07 OF 16

### 1.2.5. SAMPLE FILTER

Sample particulates removal shall be accomplished by passing all samples through cartridge type filters with type 316 stainless steel body & Owner approved material for filter. The removable type filter elements shall be capable of retaining particulates of 40 microns and larger. The filter elements shall be installed immediately before the secondary coolers as indicated in the enclosed P&ID.

### 1.2.6 SECONDARY SAMPLE COOLING SYSTEM

#### A. SECONDARY SAMPLE COOLER

- 1) Each Sample stream with the required flow rate shall be finally cooled from cooler of heat exchanger type as specified below. The design, construction material and technical features of the cooler shall be subject to Owner's approval.
- 2) The secondary cooler shall use condensate quality plant auxiliary cooling water. Cooling water shall be supplied from Owner's closed cooling water system at a maximum temperature of 40°C and a maximum flow rate of 150 litres per minute. For cooling water circuit, the maximum allowable pressure drop across Owner's auxiliary cooling water supply terminals shall be limited to 0.7 kg/cm<sup>2</sup> with the maximum inlet pressure of 2.5 kg/cm<sup>2</sup>.
- 3) Sufficient heat exchanger capacity (flow rate and heat transfer capacity) shall be provided to obtain 25°C ± 1°C sample outlet temperature at the maximum flow rate required by all analysers and grab sample requirements of all sample streams assuming a fouling factor of 0.2 on both sides of the coils. The capacity calculation shall be submitted alongwith the proposal and shall be subject to Owner's approval.
- 4) Sample coolers shall be of submerged helical coil type of shell and tube design with removable shell meeting the intent of ASTM D1192-1977. The sample tube shall be continuous and shall extend through the cooling jacket. The sample tubing shall be seamless type with no welded or other joints inside the cooling jacket. Unions shall be provided to facilitate removal of coils. Sample cooler of coil shaped (tube in tube) design is not acceptable. The cooler shall be so constructed as to provide at least the calculated cooling surface.
- 5) All sample tubing, fittings and other components wetted by the samples shall be constructed of type 316SS. The shell and other components shall be of stainless steel or other material approved by Owner.



A4 - 11

REF: CE/416/KOTHAGUDEM/R&M/SWAS/PS

REV. NO. : 00

PAGE : 08 OF 16

- 6) Secondary cooler shell shall be removable without disturbing the sample connection allowing test and inspection at full sample pressure.
- 7) Temperature and flow switches as indicated in the P&ID shall be provided to annunciate high Cooling water temperature and low ACW water flow. Further the cooling water header shall be provided with pressure gauge, flow gauge, temperature gauge and isolation valves as shown in P&ID.
- 8) Secondary cooler shall be protected by a relief valve on the cooling water jacket of each cooler in addition to a relief valve at the cooling water header. Provision shall be made for heat exchanger shell drain which will be valved and piped to waste drain header to be supplied by the Bidder.

Following shall be made available by TSGENCO at site:-

- i) For Primary cooling, BCW with pressure, flow and temperature are 2.5Kg/ cm<sup>2</sup>, 18TPH, 40 deg C
- ii) For Secondary cooling, Chilled Water with pressure, flow and temperature are 3kg/CM<sup>2</sup>, 80TPH, 10 deg C

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A4 - 11

REF : CE/416/KOTHAGUDEM/R&amp;M/SWAS/PS

REV. NO. : 00

PAGE : 10 OF 16

**1.2.7. PRESSURE REDUCTION AND CONTROL**

- a. All samples shall be provided with pressure reducing valve for final pressure reduction to get required sample pressure for analysers.

The same shall be designed for required pressure & high temperature and shall be suitably sized to cater for the down stream flow requirement of the analyser. These valves shall be conveniently located for removal and disassembly for periodic cleaning.

- b. Each sample line shall include a safety relief valve set at about 3 kg/cm<sup>2</sup> downstream of the pressure reducing valve, having stainless steel wetted parts.
- c. Each sample line shall be provided with a pressure gauge and a temperature gauge at the downstream of safety relief valve. The gauges shall meet following requirements at minimum.
- |             |                                |
|-------------|--------------------------------|
| <b>Body</b> | <b>Die Cast Aluminium</b>      |
| Accuracy    | ± 1% of Span                   |
| Scale       | Linear 270° C arc              |
| Range       | To cover 125% of max of scale. |
| Housing     | As per NEMA 4 or IP65.         |
| Material    | 316 SS                         |
- d. Each grab sample line shall be provided with a grab sample valve (3 way with nozzle) in series with a back pressure regulating valve. The back pressure regulating valve shall be furnished one for each sample line to maintain constant sample pressure. The variations in sample flow to individual analysers shall not exceed five percent when the total sample flow is increased or decreased due to change in the number of individual analysers utilizing a particular sample.

**1.2.8. FLOW RATE CONTROL AND INDICATION**

Each analyser/cell shall be provided with a flow rate control and indicating device as per sample line flow diagram.

Each flow indicator shall be provided with differential pressure regulator to get require flow of sample at analyser inlet and check valve at the outlet to prevent back flow and draining of process fluid when metering tube is removed.

Flow indicators shall be purge meters with scale of about 100 mm, panel mounting bezel and stainless steel float. The body material shall be of Aluminium. Meter capacity shall be 0 to 1500 cc per minute and shall have accuracy of 3% or better. Meter of poorer accuracy will not be accepted. Flow indicators shall be of Owner's approved make and shall be mounted on the front side of SWAS panels.

**1.2.9. OTHER NECESSARY DEVICES****A. VALVES**

The steam & Water Analysis System shall be provided with the sample shut off valves, blowdown valves, solenoid actuated valves, pressure reducing valves, safety relief valves, back pressure regulating valves, high pressure reducing valves etc.

as indicated in the applicable P&I diagram of SWAS . All High

Pressure Valves shall be of 2500 Class Special, as per ANSI B 16.34. Wetted parts and Body shall be **SS 316**.

**The requirement of the important valves are specified as under.**

- (i) The sample shut off valves, blow down valves & pressure reducing valves shall have stellite spindle tip and shall be suitable for an operating pressure of 400 bar and an operating temperature of 400°C.
- (ii) The back pressure regulating valve shall be of globe type and shall be suitable for a pressure range of 0-50 psi. The back pressure regulating valve shall consist of a range spring and a diaphragm assembly. The back pressure of the regulating valve is adjusted to the required set point by the range spring. In case of any excess pressure the diaphragm shall be lifted to release the excess pressure to maintain back pressure equal to the set value. Stainless steel trim with linear flow characteristics shall be provided. Bidder shall submit the data sheet of these valves and these shall be subject to Owner's approval during detailed engineering stage.

**B. TEMPERATURE GAUGES**

Temperature gauges shall be of 100mm Hg in steel type thermometers with stainless steel capillary length required for installation. Bimetallic type thermometer will not be acceptable. Each gauge shall have a dial engraving or separate phenolic name plate to identify the service. Service engravings, temperature gauge ranges, make and model and other technical features shall be subject to owner's approval. Gauges shall be located on the front of sampling conditioning panel. Accuracy of measurement shall be  $\pm 1\%$  of full scale or better.

**C. PRESSURE GAUGES**

Pressure gauges shall be of 100mm dia, stainless steel movement and bourdon tubes & nylon bearings, each gauge shall have dial engraving or separate phenolic name-plate to identify the service. Service engravings, make, model and ranges & other technical features of pressure gauges shall be subjected to Owner's approval. Pressure gauge shall be located on the front of sample conditioning panel. Accuracy of measurement shall be  $\pm 1\%$  of full scale or better.

**D. LEVEL GAUGES**

Level gauges shall be tempered, borosilicate transparent type of minimum pressure rating of 300 psig. Make and model of level gauge shall be subjected to Owner's approval.

**E. FLOW SWITCH**

Two flow switches shall be provided, one on the primary cooling water outlet and one on the ACW outlet. The switches shall be provided with 2 SPDT alarm contacts which open on low flow for annunciation. The contacts rating shall be 5A at 240 V AC / 0.25A at 220V DC and accuracy shall be  $\pm 1\%$ . Make & model of flow switches shall be of Owner's approved vendors.

**F. TEMPERATURE SWITCH**

Temperature switches shall be provided with 2 SPDT alarm contacts. The contacts rating shall be as 5A at 240 V AC / 0.25A at 220V DC. All switches shall be repeatable within  $\pm 1\%$  of full scale range.

**G. SAMPLE PATCH BOARD**

A quick disconnect patch board area shall be furnished on the SWAS panel. The patch board shall allow sample to be routed to any analyser through quick disconnect valve at patch board on the sample conditioning panel. The area shall consist of a patch board with bulk head tube fittings with double end shut-off and hose inserts. Body protector plugs shall be provided for each bulkhead tube fittings. Number of hose inserts, disconnect fittings etc. shall be as shown in the P & I Diagram and other specification documents.

The plugs shall be of type 316 SS construction. Sufficient length of 6mm ID, 9.5mm OD Tygon tubing shall be provided for complete spanning of the patch board area for interconnection of the bulkhead tube fittings. Each connection shall be provided with a phenolic name plate engraved with a legend acceptable to the Owner.

**H. GRAB SAMPLE**

Grab sample valves on the front of SWAS panel shall be provided to direct grab samples to trough through grab sample nozzles or to the drain header. Approximately 300mm of flexible Tygon tubing shall be provided for each sample to allow grab sample collection and prevent splashing. Grab sample nozzles shall be provided with adapter and panel mounting flanges. All these items i.e. nozzles, adapter and flanges shall be of Owner approved make.



A4 - 11

REF : CE/416/KOTHAGUDEM/R&amp;M/SWAS/PS

REV. NO. : 00

PAGE : 13 OF 16

## I. SAMPLE SINK

A continuous sink, located at the place of grab sample analysis, shall be provided. The sink shall be of 316 stainless steel, 14 gauge minimum. The sample sink shall be connected to waste drain header. Sample sink shall contain an integral stainless steel ledge to accommodate sample container. DM water connection shall be provided for cleaning of sample container

### 2.0. ANALYTICAL INSTRUMENTS

- 2.1. All analysers, cells, monitors etc. as offered shall be field proven and of international reputed make. Field-proven, Microprocessor based analyser with self diagnostic feature shall be considered. The Bidder shall furnish along with his proposals all the required details in respect of each and every type of analysers/cells/monitors to establish that the offered analytical instruments are well proven for the similar applications. The Bidder shall indicate in the offer the exact chemical composition of each and every reagent. The make, type, model etc. of various analytical instruments shall be subjected to the Owner's approval.
- 2.2 All analysers, cells, monitors and accessories shall be furnished as per P&I diagram All analysers, monitors shall be furnished with all accessories wired, piped and mounted on analyser panel.
- 2.3. Alarm contacts shall be furnished with the analysers/monitors for annunciation of high or / and low alarms as indicated in list of analysers. The contact rating shall be 5A at 240 V AC./ 0.5 A at 220V DC.
- 2.4. The Bidder shall provide 2 x 4-20 mA linear isolated current output signals from analysers /monitors for recorders, DDCMIS and controls etc. as specified.

### 2.5. Analyser specification enclosed in Table-A

### 2.6 Other Requirement:

- 1 All the analysers / cells shall have
  - a) Open corrosion resistant drain to waste header.
  - b) Automatic temperature compensation shall be provided wherever required.
- 2 All chemical re-agents required for 12 months operation is to be supplied, as per shelf life.
- 3 Analysers/monitors shall be suitable for operating under the conditions specified in instrument schedule enclosed.



A4 - 11

REF : CE/416/KOTHAGUDEM/R&M/SWAS/PS

REV. NO. : 00

PAGE : 14 OF 16

- 2.7 Bidders shall meet following Provenness criterion for offered analyser models:  
-Offered analysers should be working satisfactorily for a minimum period of one year as on date of bid opening in one powerplant of min. 200 MW

BHEL shall accept only those models which shall meet provenness criterion listed above.

**2.8 In the event of order :-**

- a) Vendor shall submit drawings, data sheets, Technical literature, detailed BOM for complete system for approval by BHEL/NTPC.
- b) Indicate Shelf life of reagents.
- c) Vendor shall depute his representative to site for verification of material received at site, with respect to approved BOM / documents. A MOM shall be made with BHEL site incharge for completeness of supplies. Material shall be repacked and Handed over to BHEL site incharge.
- d) Quality plan .Vendor to note that following Tests are to be conducted as minimum:
  - Hydraulic pressure Tests for all fittings tubing, etc.
  - Functionality Tests for all components.
  - Calibration & Accuracy Test for all measuring instruments.
  - Calibration / compliance Report for all Analysers, as per range approved in datasheet.
  - IR & HV Tests for all electrical components.
  - Material TC's to be furnished for verification.
- e ) Item No. of BOM as approved or Item No. of BOM issued along with MC shall be put on the respective Boxes & Packing list by the vendor for easy correlation & identification at the time of MRC.
- f ) SHS items shall be supplied, post inspection, in sturdy wooden packing. Packing shall be designed such that materials can be stored in open environment for 2/3 years. BHEL packing standard is enclosed for reference & compliance.
- g ) Analyser shall be supplied in metallic container as per instructions indicated in Annexure-I

Note:- BHEL will discuss deviations wrt Specifications listed in this section with only those bidders which shall participate in this bid.

PROJECT: – KOTHAGUDEM UNIT–9&10 2x250MW R&M  
END USER: – TSGENCO

NOTE: - Vendors 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.

# STEAM & WATER ANALYSIS SYSTEM (SWAS)–SCHEMES

## SECTION -E

| JOB NO.                                                                                                                                                                                                                                                                                                                                          |                                                                                      |  |                        |  | PROJECT : KOTHAGUDEM UNIT–9&10 2x250MW R&M                                          |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--|------------------------|--|-------------------------------------------------------------------------------------|------------|------|-----|------|------------------------------|------------|--|--|--|-----------------------|-----|------|--|--|------|--|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------|-------|--|-------------|--|--|--|--|
| STATUS                                                                                                                                                                                                                                                                                                                                           |                                                                                      |  |                        |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| PRINT SCALE                                                                                                                                                                                                                                                                                                                                      |                                                                                      |  |                        |  | COTRACTOR : M/s. BHEL                                                               |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                               |                                                                                      |  |                        |  |  |            |      |     |      | BHARAT HEAVY ELECTRICALS LTD |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| <table border="1"> <tr> <th>REV.</th> <th>DATED.</th> <th>ALTD</th> <th>CHD</th> <th>APPD</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>                                                                                                                                                                  |                                                                                      |  |                        |  | REV.                                                                                | DATED.     | ALTD | CHD | APPD |                              |            |  |  |  | DEPT<br>CODE<br><br>I | DRN | NAME |  |  | SIGN |  | DATE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  | REV.                                                                                | DATED.     | ALTD | CHD | APPD |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  | DSGN                                                                                | HKS        |      |     |      |                              | 19.03.2019 |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| CHD                                                                                                                                                                                                                                                                                                                                              | PRK                                                                                  |  |                        |  |                                                                                     | 19.03.2019 |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| APPD                                                                                                                                                                                                                                                                                                                                             | PPS                                                                                  |  |                        |  |                                                                                     | 19.03.2019 |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| <table border="1"> <tr> <th colspan="10">TITLE</th> </tr> <tr> <th colspan="10">SWAS SCHEMES</th> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table> |                                                                                      |  |                        |  | TITLE                                                                               |            |      |     |      |                              |            |  |  |  | SWAS SCHEMES          |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | DEPT. | SCALE |  | DRAWING NO. |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  | TITLE                                                                               |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  | SWAS SCHEMES                                                                        |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  |                        |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| SIGN                                                                                                                                                                                                                                                                                                                                             |  |  | EDN–CE/416/SWAS/SCHEME |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
| DATE                                                                                                                                                                                                                                                                                                                                             |                                                                                      |  | SHEET: 01 OF 10        |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |  | REV : 00               |  |                                                                                     |            |      |     |      |                              |            |  |  |  |                       |     |      |  |  |      |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |       |  |             |  |  |  |  |

## LEGEND :

|  |                                       |                                 |                                   |
|--|---------------------------------------|---------------------------------|-----------------------------------|
|  | ISOLATING VALVE<br>(NORMALLY OPEN)    |                                 | PRESSURE GAUGE                    |
|  | ISOLATING VALVE<br>(NORMALLY CLOSED)  |                                 | LEVEL SWITCH                      |
|  | PRESS REDUCING VALVE                  |                                 | TEMPERATURE GAUGE                 |
|  | BACK PRESS REGULATOR                  |                                 | TEMPERATURE SWITCH                |
|  | SOLENOID OPERATED VALVE               |                                 | FLOW SWITCH                       |
|  | SAFETY RELIEF VALVE                   |                                 | FLOW INDICATOR (SIGHT GLASS TYPE) |
|  | 3 WAY NEEDLE VALVE                    |                                 | LEVEL GAUGE                       |
|  | SAMPLE COOLER                         |                                 | IMPULSE/ SAMPLE LINE              |
|  | SAMPLE FILTER                         |                                 | CABLE                             |
|  | EXPANDER                              |                                 | UNIT CONTROL ROOM                 |
|  | FLOW INDICATOR<br>WITH REGULATING VLV |                                 | DDC SYS, UNIT CONTROL ROOM        |
|  | CATION COLUMN (DUAL TYPE)             |                                 | ALARM ON CRT IN UCR               |
|  | CONDUCTIVITY ELEMENT                  |                                 | INDICATES RESPECTIVE SCOPE        |
|  | CONDUCTIVITY TRANSMITTER              |                                 | BHEL-EDN                          |
|  | DISSOLVED O2 ELEMENT                  | <u>ALL DIMENSIONS ARE IN MM</u> |                                   |
|  | DISSOLVED O2 TRANSMITTER              |                                 |                                   |
|  | HYDRAZINE MEAS.                       |                                 |                                   |
|  | PHOSPHATE MEAS.                       |                                 |                                   |
|  | pH ELEMENT                            |                                 |                                   |
|  | pH TRANSMITTER                        |                                 |                                   |
|  | ANALYSER (DRY PANEL)                  |                                 |                                   |

## NOTES :

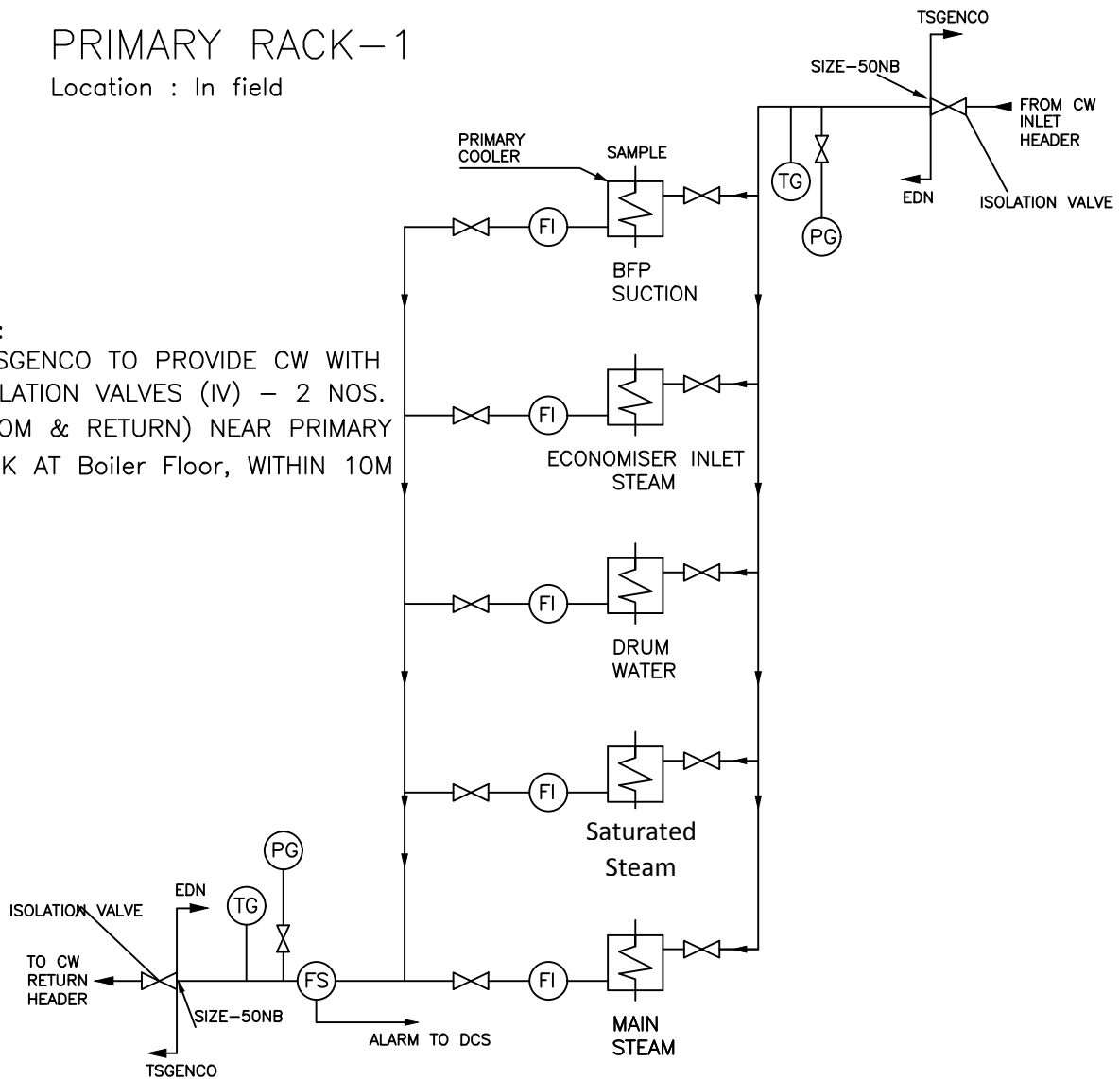
- 4-20 mA ISOLATED SIGNAL FOR ALL ANALYSERS SHALL BE HOOKED-UP TO DCS FOR MONITORING PURPOSE. NECESSARY SIGNAL DISTRIBUTION AS REQUIRED SHALL BE PROVIDED. ALARMS LIKE LOW COOLING WATER FLOW & TEMP HIGH etc. SHALL BE PROVIDED
- SAMPLING LINE IN FIELD SHALL BE OF 15mm NB, SS316. WITHIN SWAS PRIMARY RACKS/SAMPLING PANEL ,1/4"OD SS 316 TUBE SHALL BE PROVIDED.
- KKS TAG NOS. WILL BE USED AS ANALYSER TAG NUMBERS.
- FOLLOWING COOLING WATER (INLET/OUTLET) TERMINAL POINT SHALL BE PROVIDED BY TSGENCO. FURTHER DISTRIBUTION BY BHEL/SWAS SUPPLIER.
  - IN SWAS ROOM
  - IN FIELD FOR PRIMARY RACK 1
- THE COOLING WATER(CW) INDICATED IN ALL SCHEMES IS ECW/ACW
- FOR ALL DRAIN HEADERS SUITABLE MATING FLANGES AND COUNTER FLANGES SHALL BE PROVIDED.
- SAMPLE ENTRY IN PANEL SHALL BE FROM "TOP" AND CABLE ENTRY FROM "BOTTOM". SAMPLE TEMP AT PRIMARY COOLER OUTLET SHALL BE 45°C (APPROX)
- AND SAMPLE TEMP AT SECONDARY COOLER OUTLET SHALL BE 25°C (APPROX).
- APPROPRIATE EXPANDER / REDUCER SHALL BE SUPPLIED TO
- MATCH SAMPLE PIPE TAPPING / ROOT VALVE

# PRIMARY RACK-1

Location : In field

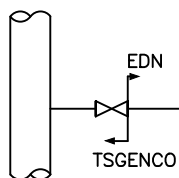
Note:

a.TSGENCO TO PROVIDE CW WITH ISOLATION VALVES (IV) – 2 NOS. (FROM & RETURN) NEAR PRIMARY RACK AT Boiler Floor, WITHIN 10M



Following shall be made available by TSGENCO at site:-

- For Primary cooling, BCW with pressure, flow and temperature are 2.5Kg/cm<sup>2</sup>, 18TPH, 40 deg C
- For Secondary cooling, Chilled Water with pressure, flow and temperature are 3kg/cm<sup>2</sup>, 80TPH, 10 deg C

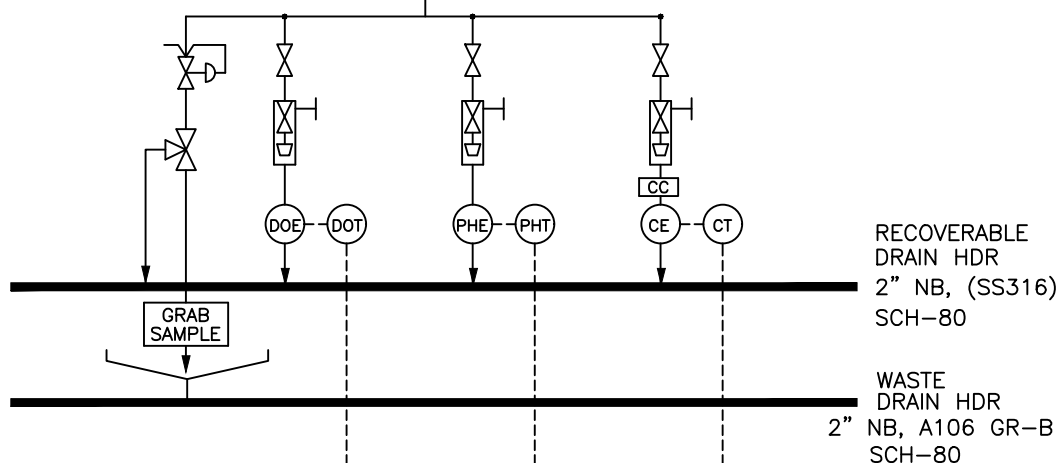
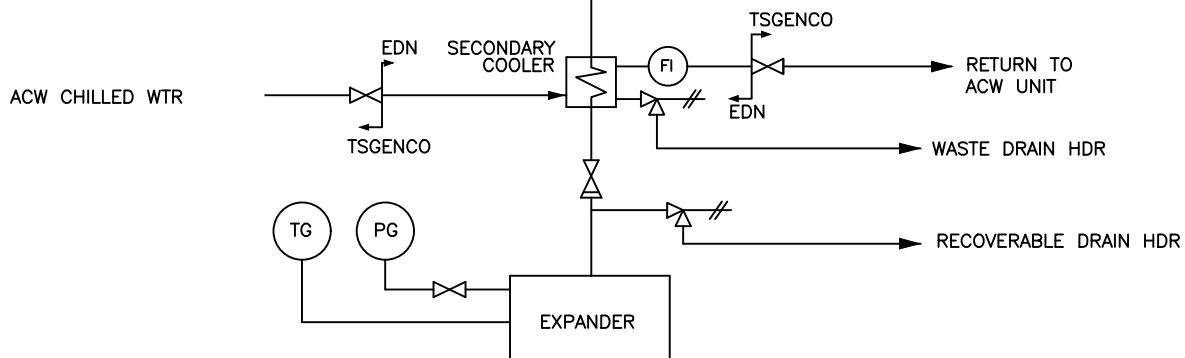
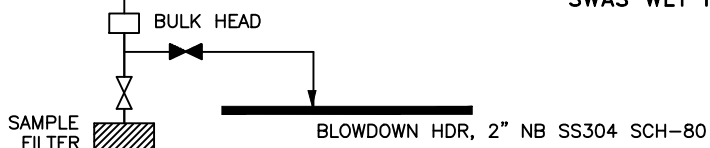


PROCESS :

| PARAMETER | MCR VALUE | ENGG UNIT              |
|-----------|-----------|------------------------|
| PRESS     | 21        | Kg/cm <sup>2</sup> (a) |
| TEMP      | 46.3      | Deg C                  |

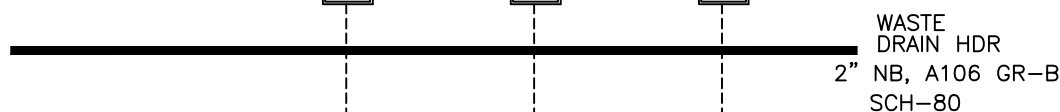
FIELD

SWAS WET PANEL



SWAS WET PANEL

SWAS DRY PANEL



UCR 4-20 mA SIGNAL TO DCS FOR MONITORING

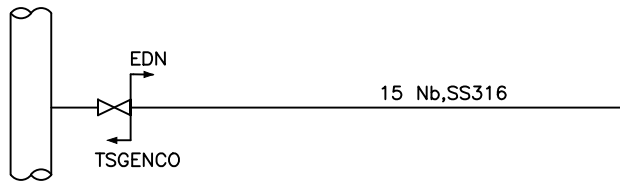
LCA20CQ101

LCA20CQ102

LCA20CQ103

CEP DISCHARGE

SHEET : 04 OF 10

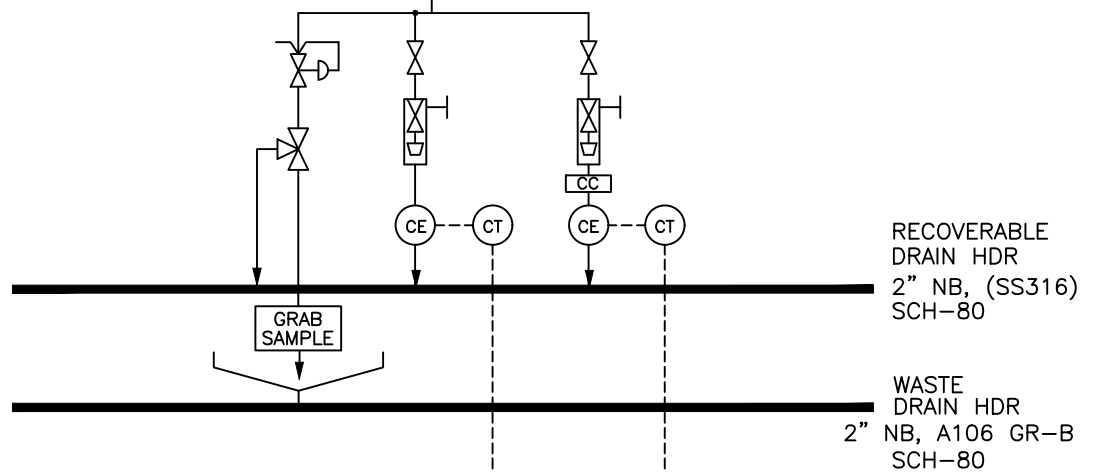
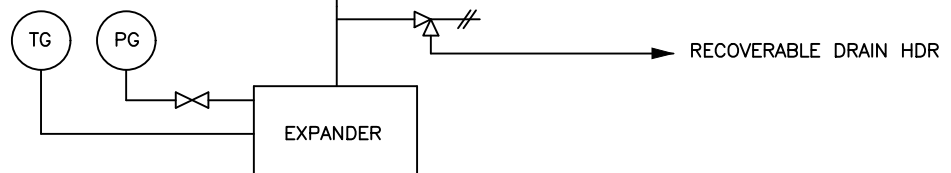
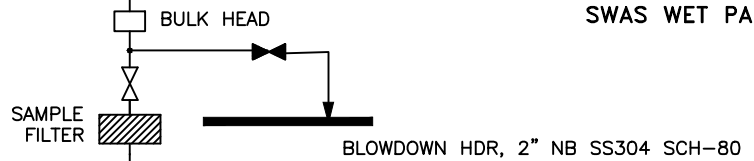


PROCESS :

| PARAMETER | MCR VALUE | ENGG UNIT |
|-----------|-----------|-----------|
| PRESS     | 4.0       | Kg/cm2(a) |
| TEMP      | 36.0      | Deg C     |

FIELD

SWAS WET PANEL



SWAS WET PANEL

SWAS DRY PANEL

A

A

WASTE DRAIN HDR  
2" NB, A106 GR-B  
SCH-80

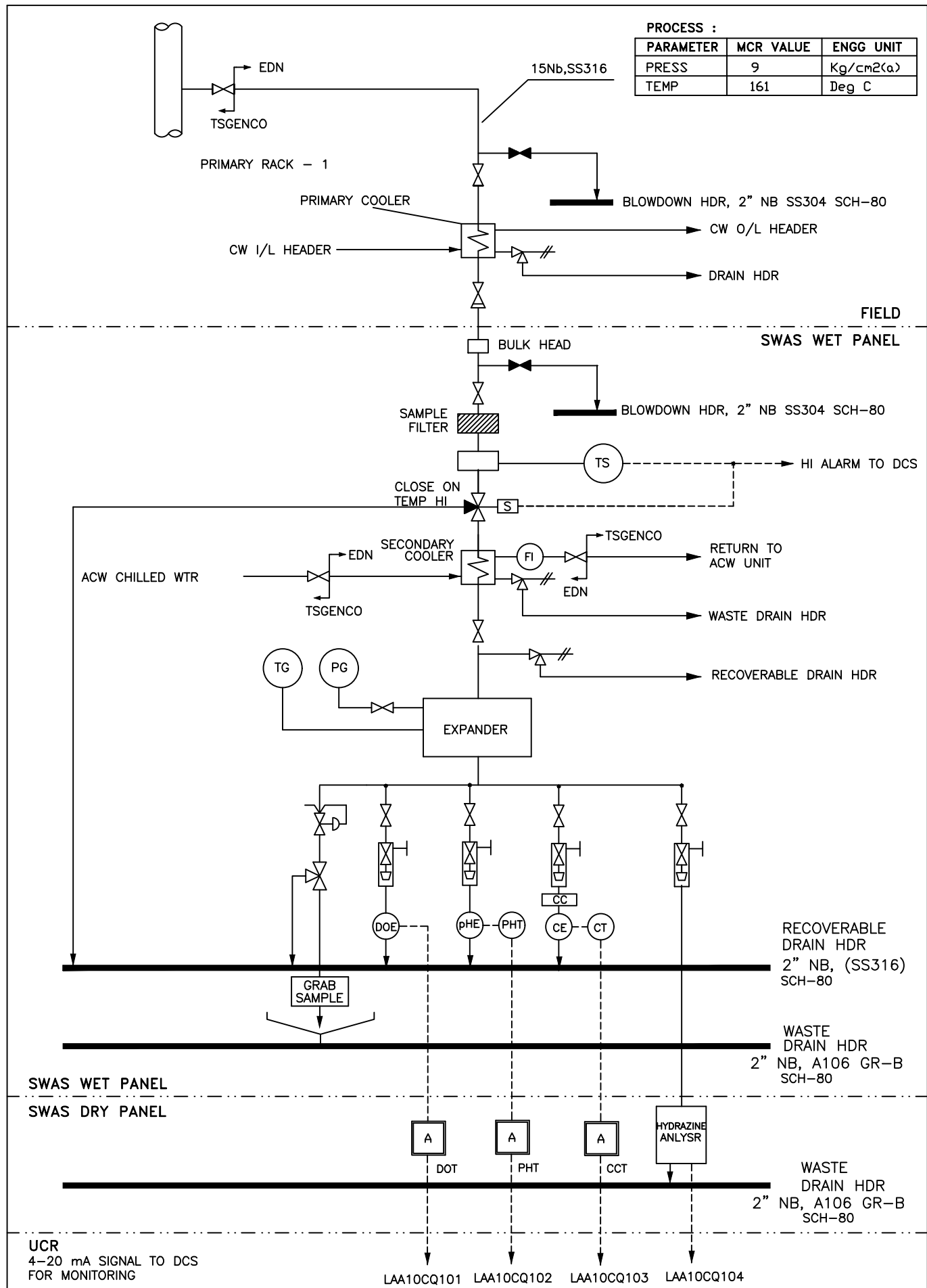
UCR 4-20 mA SIGNAL TO DCS  
FOR MONITORING

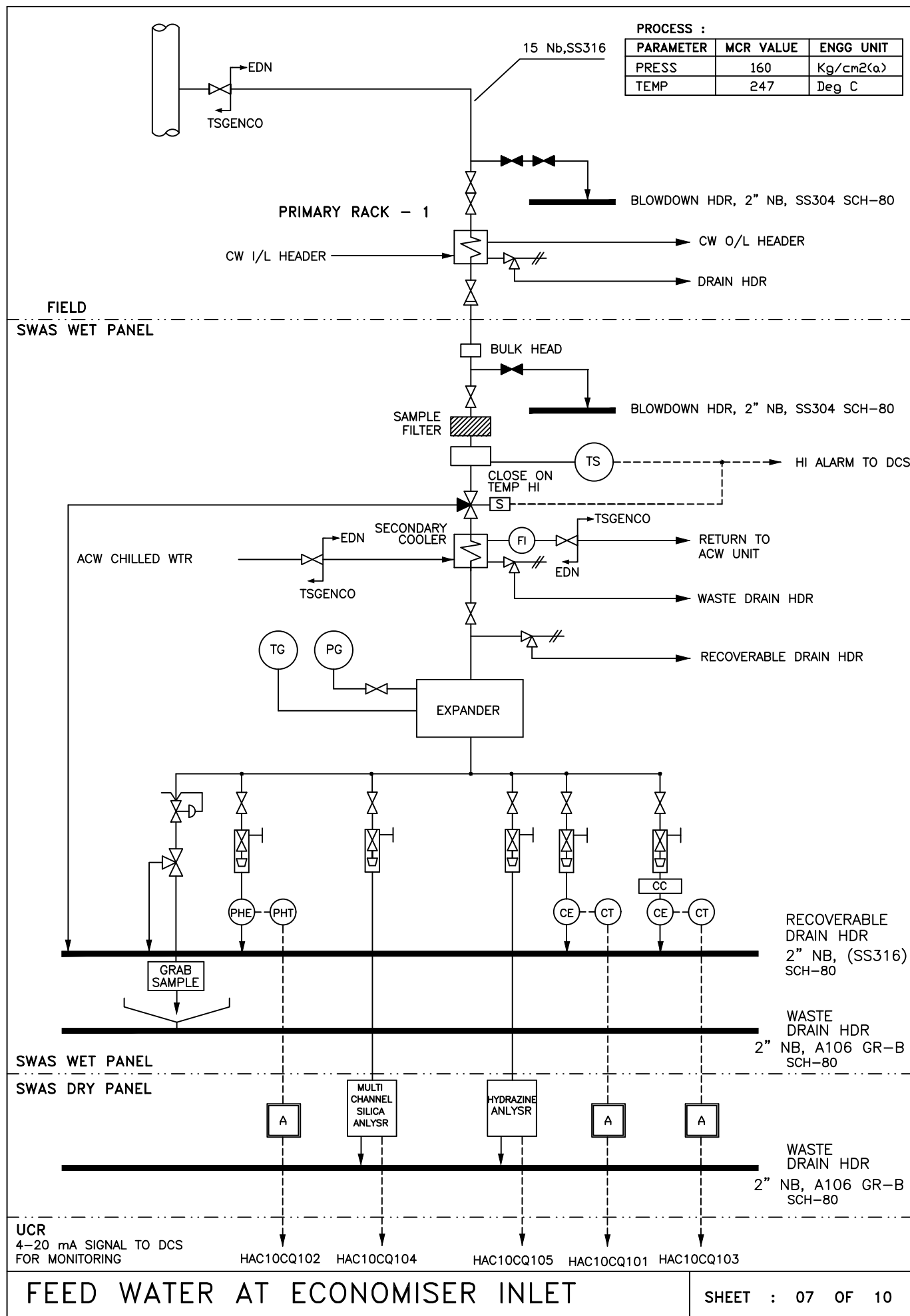
90LCR10CQ101

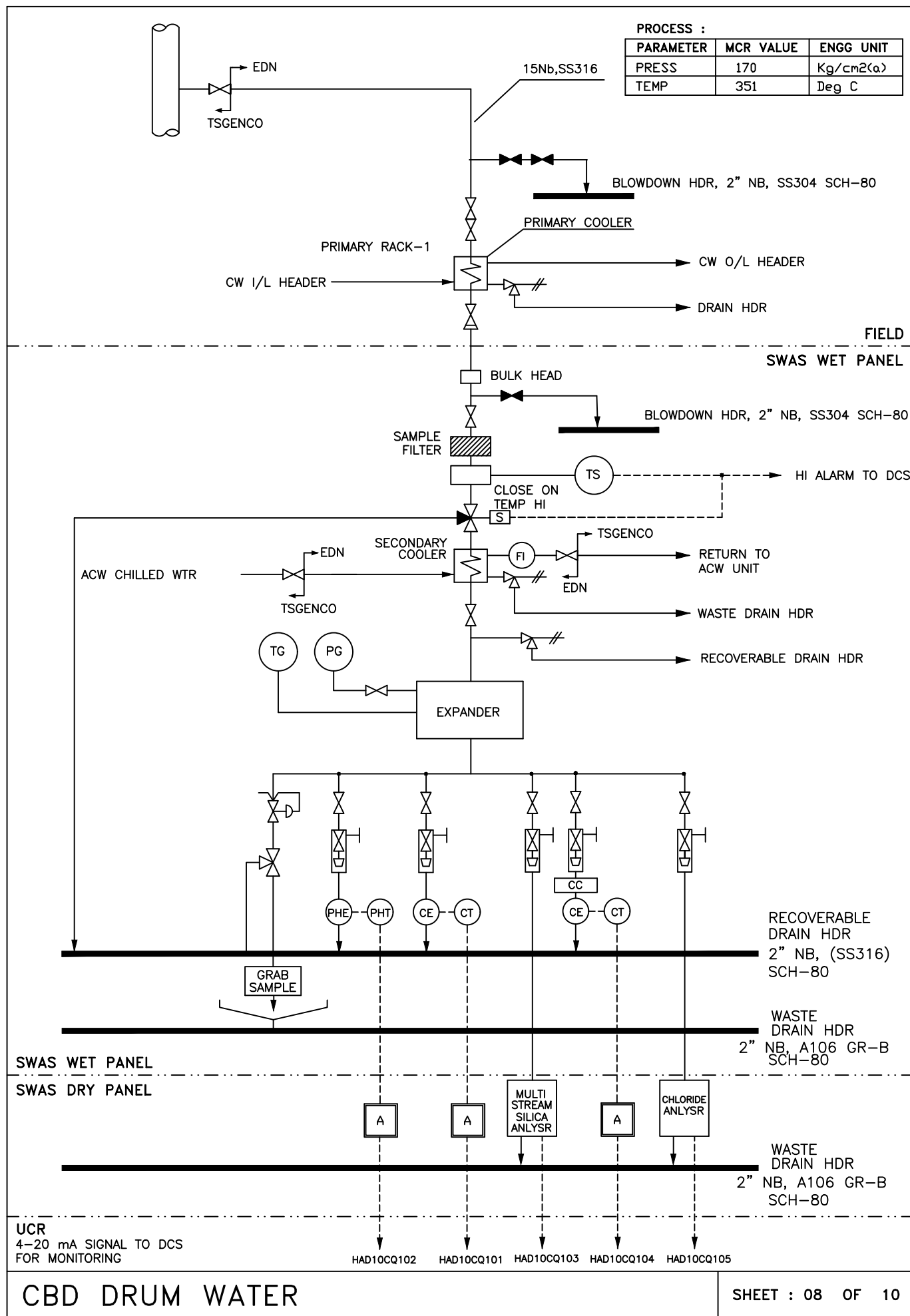
90LCR10CQ102

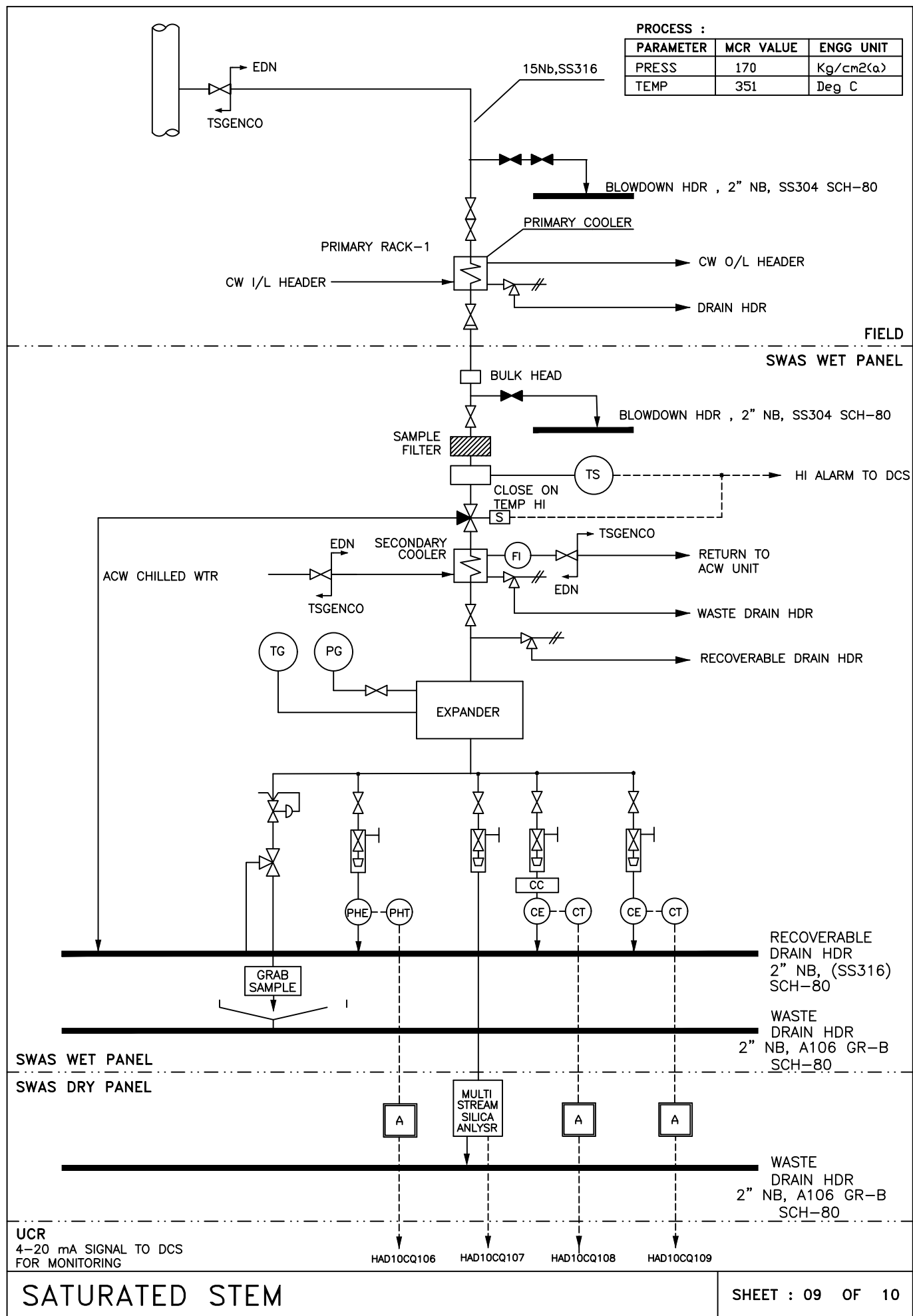
MAKE-UP DM WATER

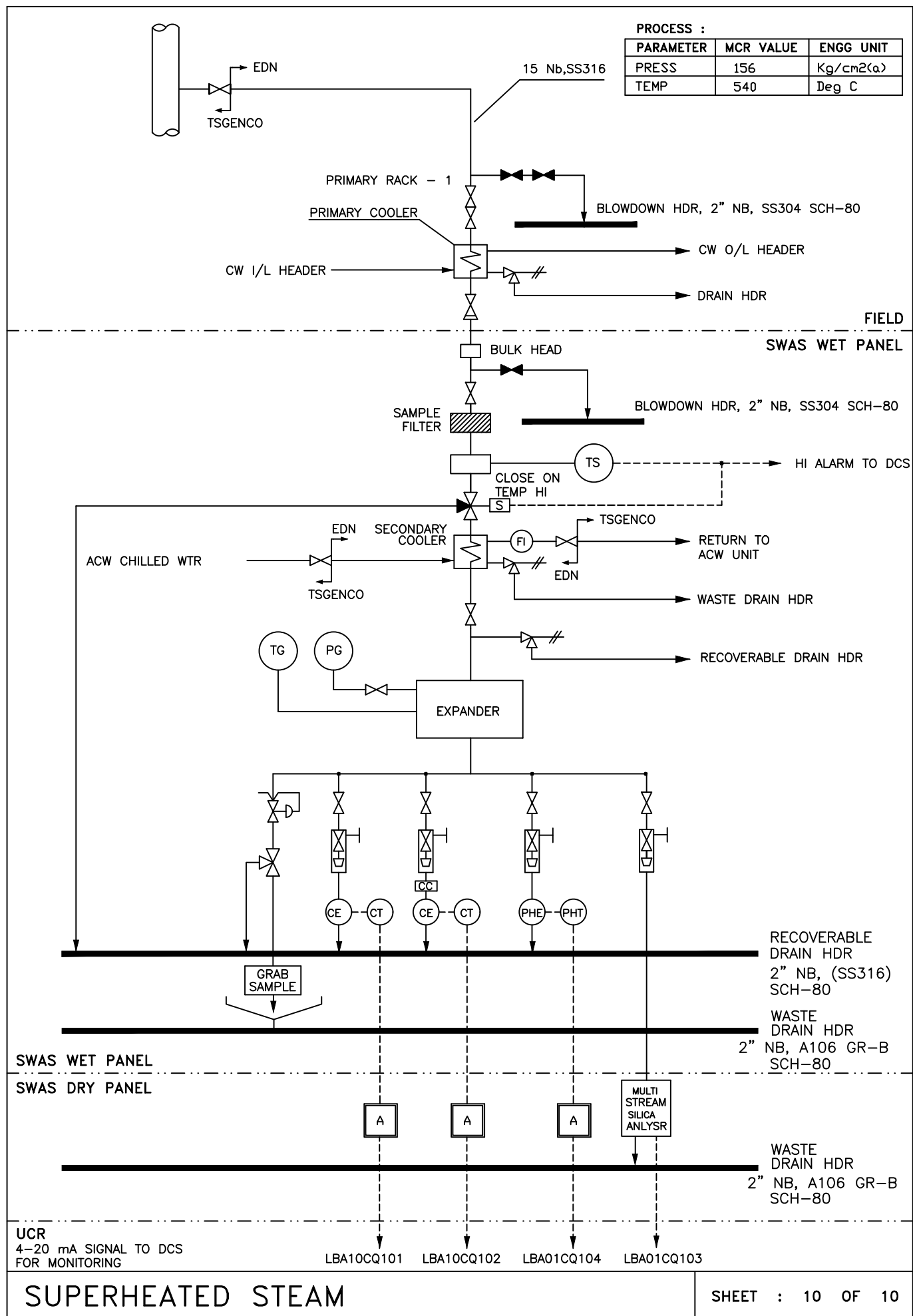
SHEET : 05 OF 10



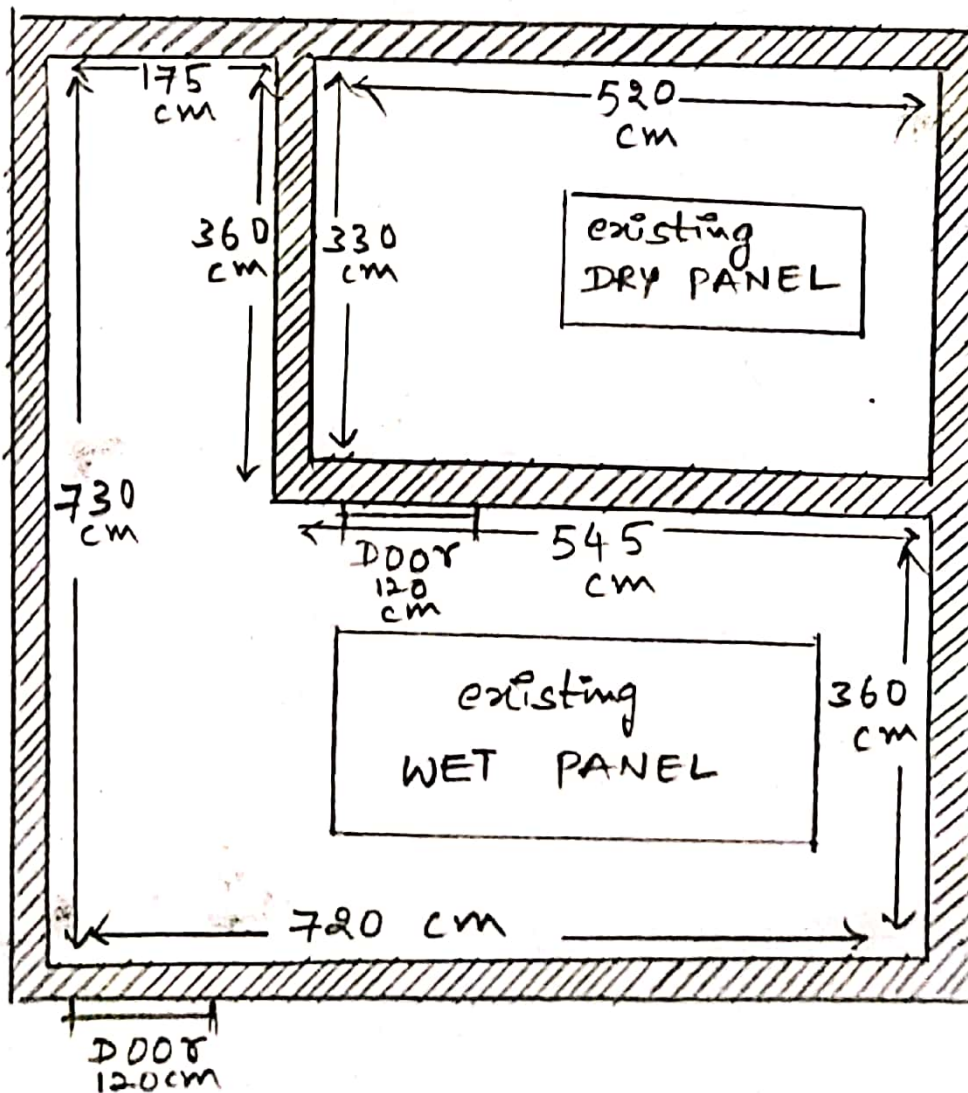








SWAS - 9<sup>th</sup> unit



**CHECK LIST FOR STAINLESS STEEL COMPRESSION FITTINGS**

NUMBER :CE/416/SSF/CL REVISION : 00 DATE : 21-07-15

CONTRACTOR : M/s BHEL-EDN

| SL NO. | TESTS/CHECKS                           | QUANTUM OF CHECK         | REFERENCE DOC. ACCEPTANCE NORMS.     | AGENCY** |   |   |    | REMARKS |
|--------|----------------------------------------|--------------------------|--------------------------------------|----------|---|---|----|---------|
|        |                                        |                          |                                      | M        | C | N | D* |         |
| 1      | DIMENSIONS                             | REFER<br>NOTE : 1        | ↑                                    | P        | V | V |    |         |
| 2      | MATERIAL                               | SAMPLE/<br>HEAT /<br>LOT | APPROVED SPECS./<br>DATA SHEETS<br>↓ | P        | V | V |    |         |
| 2.1    | CHEMICAL                               |                          |                                      | P        | V | V | ✓  |         |
| 2.2    | PHYSICAL, HARDWARE                     |                          |                                      |          |   |   |    |         |
| 3      | PROOF PRESSURE TEST                    | 5 RDM.<br>SAMPLE         | ↑                                    | P        | V | V | ✓  |         |
| 4      | DISMANTLING<br>RE-ASSEMBLY TEST        | 3 RDM.<br>SAMPLE         | ↑                                    | P        | V | V |    |         |
| 5      | HYDRAULIC IMPULSES &<br>VIBRATION TEST | 5 RDM.<br>SAMPLE         | ↓                                    | P        | V | V | ✓  |         |

**LEGEND :**

\* RECORDS, IDENTIFIED WITH ' ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.

\*\* M: MANUFACTURER/SUB CONTRACTOR, C:CONTRACTOR/NOMINATED INSP.AGENCY  
N: CUSTOMER "P" PERFORM "W" WITNESS "V" VERIFICATION

**NOTE** 1) QUANTUM OF CHECK SHALL BE AS BELOW :

100% - BY MANUFACTURER  
NIL -BY M/s BHEL  
NIL CUSTOMER

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING BETTER ACCURACY THAN THE ITEM UNDER TEST. INSPECTING ENGINEER SHALL CHECK THE SAME.

**PREPARED BY**  
**M/S BHEL**



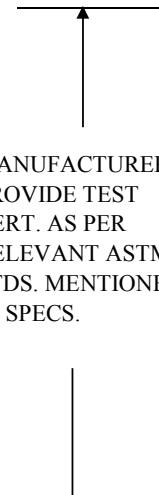
**CHECK LIST FOR IMPULSE PIPES AND TUBES**

NUMBER : CE/416/SP/CL

REVISION : 00

DATE : 21-07-15

CONTRACTOR : M/S BHEL-EDN

| SL NO. | TESTS/CHECKS                                                                                              | QUANTUM OF CHECK | REFERENCE DOC. ACCEPTANCE NORMS.                                      | AGENCY** |   |   |    | REMARKS                                                                                                                                                                       |
|--------|-----------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------|----------|---|---|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                                                                                                           |                  |                                                                       | M        | C | N | D* |                                                                                                                                                                               |
| 1      | CHEEH FOR DIMENSION, GRADE, SURFACE-DEFECTS                                                               | SEE NOTE: BELOW  | APPROVED DATA SHEET AND CORES SPONDING ASTM STDSFOR GRADE OF MATERIAL | P        | V | V | ✓  |  <p>MANUFACTURER TO PROVIDE TEST CERT. AS PER RELEVANT ASTM STDS. MENTIONED IN SPECS.</p> |
| 2      | CHEMICAL PROPERTIES AND PHY. PROPERTIES AS PER RELEVANT ASTM. (GRADE SHALL BE AS PER APPROVED DATA SHEET) | FOR LOT          |                                                                       | P        | V | V | ✓  |                                                                                                                                                                               |
| 3      | FLATTENING TEST.                                                                                          |                  | DO                                                                    | P        | V | V | ✓  |                                                                                                                                                                               |
| 4      | FLARING TEST                                                                                              | ##               |                                                                       | P        | V | V | ✓  |                                                                                                                                                                               |
| 5      | BENDING TEST.                                                                                             | **               |                                                                       | P        | V | V | ✓  |                                                                                                                                                                               |
| 6      | HYDRAULIC TEST OR EDDY CURRENT TEST                                                                       |                  |                                                                       | P        | V | V | ✓  |                                                                                                                                                                               |
| 7      | HARDNESS CHECK                                                                                            | ##               |                                                                       | P        | V | V | ✓  |                                                                                                                                                                               |

**LEGEND :**

\* RECORDS, IDENTIFIED WITH ' \ ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.

\*\* M: MANUFACTURER/SUB CONTRACTOR, C:CONTRACTOR/NOMINATED INSP.AGENCY  
N: CUSTOMER "P" PERFORM "W" WITNESS "V" VERIFICATION

**NOTE :** 1) QUANTUM OF CHECK SHALL BE AS BELOW :

100% - BY MANUFACTURER.

NIL -BY M/S BHEL

NIL - BY CUSTOMER

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING BETTER ACCURACY THAN THE ITEM UNDER TEST. INSPECTING ENGINEER SHALL CHECK THE SAME.

3) ## APPLICABLE FOR TUBES ONLY

4) \*\* APPLICABLE FOR CS PIPES ONLY.

5) WHEN MATERIAL CORRELATION IS NOT POSSIBLE , MATERIAL SAMPLES ARE TO BE TESTED AT THIRD PARTY LAB & TEST CERTIFICATES ARE TO BE SUBMITTED FOR NTPC REVIEW - CHP

**PREPARED BY**  
**M/S BHEL**



**CHECK LIST FOR FLOW SWITCH**

NUMBER : CE/416/FS/CL      REVISION : 00    DATE : 21-07-15

CONTRACTOR : M/s BHEL-EDN

| SL NO. | TESTS/CHECKS                              | QUANTUM OF CHECK       | REFERENCE DOC. ACCEPTANCE NORMS. | AGENCY** |   |   |    | REMARKS                                                            |
|--------|-------------------------------------------|------------------------|----------------------------------|----------|---|---|----|--------------------------------------------------------------------|
|        |                                           |                        |                                  | M        | C | N | D* |                                                                    |
| 1.0    | TYPE , MODEL , SL . NO . TAG NO. , RANGE. | ↑                      | ↑                                | P        | V | V | ✓  | IN CASE OF IMPORTED ITEMS, CONTR. SHALL REVIEW TC's & NOT INSPECT. |
| 2.0    | SIZE , DIMENSIONS                         | REFER                  | AS PER APPROVED DATA SHEETS      | P        | V | V | ✓  |                                                                    |
| 3.0    | REPEATABILITY                             | NOTE : 1<br>BELOW<br>↓ |                                  | P        | V | V | ✓  |                                                                    |
| 4.0    | HV / IR                                   | 100%                   |                                  | P        | V | V | ✓  |                                                                    |
| 5.0    | CONTACT RATNG / NO. OF CONTACTS           | <br>RANDOM             |                                  | P        | V | V | ✓  |                                                                    |
| 6.0    | MATL. T.C. FOR BODY, WET PARTS.           | ONE/LOT                |                                  | P        | V | V | ✓  |                                                                    |
| 7.0    | ACCESSORIES AS APPLICABLE                 | 100%                   | ↓                                | P        | V | V | ✓  |                                                                    |

**LEGEND :**

\* RECORDS, IDENTIFIED WITH ✓ SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.

\*\* M: MANUFACTURER/SUB CONTRACTOR, C:CONTRACTOR/NOMINATED INSP.AGENCY  
N: CUSTOMER "P" PERFORM "W" WITNESS "V" VERIFICATION**NOTE :** 1) QUANTUM OF CHECK SHALL BE AS BELOW :

100 %      - BY MANUFACTURER.

NIL        - BY CONTRACTOR.

NIL        -BY M/S CUSTOMER.

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING BETTER ACCURACY THAN THE ITEM UNDER TEST.

**PREPARED**  
**M/S BHEL**

**CHECK LIST FOR TEMPERTURE SWITCH**

NUMBER : CE/416/TS/CL REVISION : 00 DATE : 21-07-15

CONTRACTOR : M/s BHEL-EDN

| SL NO. | TESTS/CHECKS                           | QUANTUM OF CHECK | REFERENCE DOC. ACCEPTANCE NORMS. | AGENCY** |   |   |    | REMARKS                                                            |
|--------|----------------------------------------|------------------|----------------------------------|----------|---|---|----|--------------------------------------------------------------------|
|        |                                        |                  |                                  | M        | C | N | D* |                                                                    |
| 1.0    | TYPE, MODEL, SL. NO., TAG NO., RANGE.  | ↑                | ↑                                | P        | W | V | ✓  | IN CASE OF IMPORTED ITEMS, CONTR. SHALL REVIEW TC's & NOT INSPECT. |
| 2.0    | DIMENSIONS CHECK                       | ↑                | APPROVED SPECS./ DATA SHEETS     | P        | W | V | ✓  |                                                                    |
| 3.0    | REPEATABILITY                          | REFER            |                                  | P        | W | V | ✓  |                                                                    |
| 4.0    | SWITCHING DIFERENTIAL                  | NOTE : 1 BELOW   |                                  | P        | W | V | ✓  |                                                                    |
| 5.0    | CONTACT RATING / NO. OF CONTACTS       | ↓                |                                  | P        | W | V | ✓  |                                                                    |
| 6.0    | MATL. T.C. FOR BULB, CAPILLARY, ARMOUR | RANDOM           |                                  | P        | V | V | ✓  |                                                                    |
| 7.0    | HV / IR                                | ONE/LOT          |                                  | P        | W | V | ✓  |                                                                    |
| 8.0    | DEGREE OF PROTECTION                   | RANDOM           |                                  | P        | V | V | ✓  |                                                                    |
| 9.0    | THERMOWELLS                            | TYPE TEST        |                                  | P        | V | V | ✓  |                                                                    |
| 9.1    | DIMENSIONS                             | 100%             |                                  | P        | V | V | ✓  |                                                                    |
| 9.2    | MATL. T.C. FOR THERMOWELL              | ONE/LOT          | P                                | V        | V | ✓ |    |                                                                    |
| 9.3    | HYD. TEST                              | 100%             | P                                | W        | V | ✓ |    |                                                                    |
| 9.4    | IBR CERT. IF APPLICABLE.               | ↓                | P                                | V        | V | ✓ |    |                                                                    |

**LEGEND :**

\* RECORDS, IDENTIFIED WITH ' ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.

\*\* M: MANUFACTURER/SUB CONTRACTOR, C:CONTRACTOR/NOMINATED INSP. AGENCY  
N: CUSTOMER "P" PERFORM "W" WITNESS "V" VERIFICATION

**NOTE :** 1) QUANTUM OF CHECK SHALL BE AS BELOW :

- 100 % - BY MANUFACTURER.  
NIL - BY CONTRACTOR.  
NIL - BY M/s CUSTOMER.

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING BETTER ACCURACY THAN THE ITEM UNDER TEST. INSPECTING ENGINEER SHALL CHECK THE SAME.



**PREPARED BY :**  
M/S BHEL



**CHECK LIST FOR TEMPERATURE GAUGE / PAGE 1 OF 2**

NUMBER : CE/416/TG/CL      REVISION : 00      DATE : 21-07-15

CONTRACTOR : M/s B H E L - EDN

| SL NO. | TESTS/CHECKS                       | QUANTUM OF CHECK                                                                    | REFERENCE DOC. ACCEPTANCE NORMS        | AGENCY** |   |   |    | REMARKS                                                                 |
|--------|------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------|----------|---|---|----|-------------------------------------------------------------------------|
|        |                                    |                                                                                     |                                        | M        | C | N | D* |                                                                         |
| 1.0    | CHECK FOR                          |    | APPROVED SPECS. / APPROVED DATA SHEETS | P        | V | V | ✓  | BY GO / NOGO GAUGE                                                      |
| 1.1    | DIAL SIZE                          |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 1.2    | MODEL NO/TAG NO                    |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 1.3    | RANGE/SCALE                        |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 1.4    | END CONNECTION                     |    | DO                                     | P        | V | V | ✓  | MFR TO CARRY OUT ROUTINE TEST ON 100 %                                  |
| 2.0    | CALIBRATION                        |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 2.1    | ACCURACY                           |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 2.2    | REPETABILITY                       |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 2.3    | HYSTERESIS                         |  | DO                                     | P        | V | V | ✓  | WHEN MAT'L CORELATION ARE NOT AVAILABLE MFR'S COMPLIANCE TO BE PROVIDED |
| 3.0    | OVER TEMPERATURE TEST              |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 4.0    | AMBIENT TEMP. COMPENSATION CHECK   |                                                                                     |                                        | P        | V | V | ✓  |                                                                         |
| 5.0    | REVIEW OF T.C FOR MATERIALS OF-    |                                                                                     |                                        |          |   |   |    |                                                                         |
| 5.1    | SENSOR                             | TYPE TEST                                                                           | AS PER APPROVED DRAWING                | V        | V | V | ✓  | IBR CERT. TO BE PROVIDED IF CALLED IN SPECS.                            |
| 5.2    | MOVEMENT                           |                                                                                     |                                        | V        | V | V | ✓  |                                                                         |
| 5.3    | PROCESS CONNec.                    |                                                                                     |                                        | V        | V | V | ✓  |                                                                         |
| 5.4    | HOUSING                            |                                                                                     |                                        | V        | V | V | ✓  |                                                                         |
| 6.0    | REVIEW OF TC FOR DEGREE OF PROTEC. |  | AS PER APPROVED DRAWING                | P        | V | V | ✓  | IBR CERT. TO BE PROVIDED IF CALLED IN SPECS.                            |
| 7.0    | THERMOWELL                         |                                                                                     |                                        | V        | V | V | ✓  |                                                                         |
| 7.1    | HYD TEST ON THERMOWELL             |                                                                                     |                                        | V        | V | V | ✓  |                                                                         |
| 7.2    | MATERIAL T.C FOR THERMOWELL        |                                                                                     |                                        | V        | V | V | ✓  |                                                                         |
| 7.3    | DIMENSIONAL CHECK                  |                                                                                     |                                        |          |   |   |    |                                                                         |

**LEGEND:**

\* RECORDS, IDENTIFIED WITH '✓' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION

\*\* M: MANUFACTURER/SUB CONTRACTOR, C: CONTRACTOR/NOMINATED INSP. AGENCY.  
N: CUSTOMER "P" PERFORM "W" WITNESS "V" VERIFICATION

**CHECK LIST FOR TEMPERATURE GAUGE / PAGE 2 OF 2**

NUMBER : CE/416/TG/CL      REVISION : 00      DATE : 21-07-15

CONTRACTOR : M/s B H E L - EDN

-----  
NOTE : 1) QUANTUM OF CHECK SHALL BE AS BELOW :

100 % - BY MANUFACTURER.

NIL - BY M/s BHEL.

NIL - BY CUSTOMER

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING  
BETTER ACCURACY THAN THE ITEM UNDER TEST. INSPECTING  
ENGINEER SHALL CHECK THE SAME.

PREPARED BY :  
M/S BHEL



**CHECK LIST FOR PRESSURE & DIFFERENTIAL PRESSURE SWITCH**

NUMBER : CE/416/PS/CL REVISION : 00 DATE : 21-07-15

CONTRACTOR : M/s B H E L - EDN

| SL NO. | TESTS/CHECKS                              | QUANTUM OF CHECK                 | REFERENCE DOC. ACCEPTANCE NORMS. | AGENCY** |   |   |    | REMARKS                                                                                                     |
|--------|-------------------------------------------|----------------------------------|----------------------------------|----------|---|---|----|-------------------------------------------------------------------------------------------------------------|
|        |                                           |                                  |                                  | M        | C | N | D* |                                                                                                             |
| 1.0    | CHECK FOR                                 | ↑                                | APPROVED SPECS. / DATA SHEETS    | P        | V | V | ✓  | BY GO/ NO GO GAUGE                                                                                          |
| 1.1    | MODEL NO. TAG NO.                         |                                  |                                  | P        | V | V | ✓  |                                                                                                             |
| 1.2    | RANGE                                     |                                  |                                  | P        | V | V | ✓  |                                                                                                             |
| 1.3    | END CONNECTION                            | SEE NOTE-1 BELOW<br>↓<br>FOR LOT | DO                               | P        | V | V | ✓  | MFR. TO CARRY OUT ROUTINE TEST ON WHEN MAT'L CORRELATION ARE NOT AVAILABLE MFR'S COMPLIANCE TO BE PROVIDED. |
| 2.0    | REPEATABILITY                             |                                  |                                  | P        | V | V | ✓  |                                                                                                             |
| 2.1    | HYSTERESIS                                |                                  |                                  | P        | V | V | ✓  |                                                                                                             |
| 3.0    | DIFFERENTIAL                              |                                  |                                  | P        | V | V | ✓  |                                                                                                             |
| 4.0    | OVER PRESSURE AND LEAK TEST               |                                  |                                  | P        | V | V | ✓  |                                                                                                             |
| 5.0    | ELECTRICAL INSULATION / H.V TEST          |                                  |                                  | V        | V | V | ✓  |                                                                                                             |
| 5.1    | REVIEW OF T.C FOR MATERIALS OF-<br>SENSOR |                                  |                                  | V        | V | V | ✓  |                                                                                                             |
| 5.2    | MOVEMENT                                  | TYPE TEST                        | ↓                                | V        | V | V | ✓  |                                                                                                             |
| 5.3    | HOUSING                                   |                                  |                                  | V        | V | V | ✓  |                                                                                                             |
| 6.0    | TC OF MICRO SWITCH                        |                                  |                                  | V        | V | V | ✓  |                                                                                                             |
| 7.0    | REVIEW OF T.C FOR DEGREE OF PROTECTION.   |                                  |                                  | V        | V | V | ✓  |                                                                                                             |

**LEGEND:**

\* RECORDS, IDENTIFIED WITH ' ✓ ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION

\*\* M: MANUFACTURER/SUB CONTRACTOR, C: CONTRACTOR/NOMINATED INSP. AGENCY.  
N: CUSTOMER "P" PERFORM "W" WITNESS "V" VERIFICATION

NOTE : 1) QUANTUM OF CHECK SHALL BE AS BELOW : 100 % - BY MANUFACTURER  
NIL - BY CONTRACTOR.  
NIL - BY M/s CUSTOMER

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING BETTER ACCURACY THAN THE ITEM UNDER TEST. INSPECTING ENGINEER SHALL CHECK THE SAME.

3) IN CASE OF IMPORTED PRESSURE SWITCHES DP SWITCHES BHEL SHALL REVIEW TC AND SHALL NOT INSPECT.

PREPARED BY :

M/S BHEL



**CHECK LIST FOR PRESSURE GAUGE & DIFFERENTIAL PRESSURE GAUGE**

NUMBER : CE/416/PG/CL REVISION : 00 DATE : 21-07-15

CONTRACTOR : M/S B H E L - EDN

| SL NO. | TESTS/CHECKS                       | QUANTUM OF CHECK                   | REFERENCE DOC. ACCEPTANCE NORMS.        | AGENCY** |   |   |    | REMARKS                                                                                                          |
|--------|------------------------------------|------------------------------------|-----------------------------------------|----------|---|---|----|------------------------------------------------------------------------------------------------------------------|
|        |                                    |                                    |                                         | M        | C | N | D* |                                                                                                                  |
| 1.0    | CHECK FOR                          | <div><div></div><div>↑</div></div> | APPROVED SPECS. / DATA SHEETS           | P        | V | V | ✓  | MFR TO CARRY OUT ROUTINE TEST ON 100 % . WHEN MAT'L CORELATION ARE NOT AVAILABLE MFR'S COMPLIANCE TO BE PROVIDED |
| 1.1    | DIAL SIZE                          |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 1.2    | MODEL NO/TAG NO                    |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 1.3    | RANGE/SCALE                        |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 1.4    | END CONNECTION                     | <div>SEE NOTE-1</div> <div>↓</div> | <div>↑</div> <div>DO</div> <div>↓</div> | P        | V | V | ✓  |                                                                                                                  |
| 2.0    | CALIBRATION                        |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 2.1    | ACCURACY                           |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 2.2    | REPETABILITY                       |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 2.3    | HYSTERESIS                         |                                    |                                         | P        | V | V | ✓  |                                                                                                                  |
| 3.0    | OVER PRESSURE AND LEAK TEST        | # ONE                              |                                         | P        | V | V | ✓  |                                                                                                                  |
| 4.0    | OPERATION OF PR. RELIEF DEVICE.    |                                    |                                         | V        | V | V | ✓  |                                                                                                                  |
| 5.0    | REVIEW OF T.C FOR MATERIALS OF-    |                                    |                                         | V        | V | V | ✓  |                                                                                                                  |
| 5.1    | SENSOR                             |                                    |                                         | V        | V | V | ✓  |                                                                                                                  |
| 5.2    | MOVEMENT                           | FOR LOT                            |                                         | V        | V | V | ✓  |                                                                                                                  |
| 5.3    | PROCESS CONNEC.                    |                                    |                                         | V        | V | V | ✓  |                                                                                                                  |
| 5.4    | HOUSING                            |                                    |                                         | V        | V | V | ✓  |                                                                                                                  |
| 6.0    | REVIEW OF TC FOR DEGREE OF PROTEC. |                                    |                                         | V        | V | V | ✓  |                                                                                                                  |
| 7.0    | ACCESSORIES, AS APPLICABLE         | TYPE TEST SEE NOTE-1               | V                                       | V        | V | ✓ |    |                                                                                                                  |

**LEGEND:**

\* RECORDS, IDENTIFIED WITH ' ✓ ' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION

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NIL - BY M/s BHEL.

NIL - BY M/s CUSTOMER

2) MANUFACTURER TO MAINTAIN CALIBRATED INSTRUMENT HAVING BETTER ACCURACY THAN THE ITEM UNDER TEST. INSPECTING ENGINEER SHALL CHECK THE SAME.

3) # ONE FOR PR. GAUGE AND ONE FOR DP GAUGE.

PREPARED BY :  
M/S BHEL





REF. : KOTHAGUDEM/416/SWAS/VL

REV. NO. : 00

PAGE : 01 OF 02

PROJECT :- KOTHAGUDAM R&amp;M - 2 X 250 MW TPS

CUSTOMER :- TSGENCO

## SECTION -G

## APPROVED VENDOR LIST

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COMPANY

REVISIONS :

APPROVED

( Punit P Singh )

PREPARED

ISSUED

DATE

PRK

416

22-05-2019

**APPROVED VENDOR LIST**

**SS TUBES AND PIPES** : Trouvay & Cauvin, Dubai, TPS Technitube Germany, ISMT India(CS Pipes), Ratnamani Ahmedabad, Sumitomo /Nippon/KawasakiJapan, BHEL-Trichy, Maneesmann Germany, Jindal Saw Pipes India, Heavy Metals Ahmedabad, Suraj pipes Mahalaxmi Seamless, Subhalaxmi Metals & Tubes

**PRESSURE GAUGES** : ANI Kolkatta, WIKA ,India,Goa Thermostatic,Goa , Manometer India Gauges Bourdon Mumbai, H.GURU, B'LORE , Forbes Marshall Hyderabad Walchandnagar, Dharwad

**TEMPERATURE GAUGES** : Gauges Bourdon Mumbai, WIKA, INDIA, H.GURU, B'LORE, ,Goa Thermostatic,Goa, Baumer Dadra, Ashcroft India, Forbes Marshall Hyd ANI Chennai, Goa Insts. Goa,

**PRESSURE SWITCH** : Indfoss Ghaziabad, Switzer Chennai, SOR-USA , Baumer Vapi Gauges Bourdon Mumbai, Trafag Ranipet, Ashcroft Ahmedabad

**TEMPERATURE SWITCH** : Switzer Madras, Indfoss-Ghaziabad, Gauges Bordon

**Terminals** : Wago Noida , Phoenix, Noida,

**INSTRUMENT VALVES** : BHEL - TRICHY, Baldota Mumbai, IL PALGHAT, Hyd Air Lonavala Excel Hydro Pneumatics Mumbai, Metpress Engg. Kolkata, Prime Mumbai PMT Engg. Ahmedabad, Precision Engg. Mumbai,AURA INC, NEW DELHI, HP Valves Chennai Shalimar Valves Mumbai, Forbes Marshall Pune, Fluid Controls Pune

**Compression Fittings** : Excel Hydro Pneumatics Mumbai, Metpress Engg. Kolkata Precision Engg. Mumbai, Swagelock USA, Parker Hanifin USA, Astec Thane Aura Inc. Delhi, Fluid Controls Mumbai, HP Valves, Chennai, Panam Engg. Mumbai,PMT Engg., Ahmedabad

**Furniture :-** Godrej , Feather lite,COSMOS MEDIA PRODUCTS PVT LTD ,NOIDA PYROTECH LTD , UDAIPUR , OTS Bangalore

**Annunciator:-** IK KOTA, PROCON CHENNAI

**Analysers:-** E/ H GERMANY, EMERSON PROCESS USA, HACH USA, THERMO ORION, ABB UK, YOKOGAWA JAPAN, Teledyne USA

**Note:-**

- Vendors to note that for major components of Sample Handling System, above indicated vendors only will be acceptable.

**SECTION - "H"**

- Analysers & Spares shall be packed project wise in lockable Metal Container suitable for outside storage at project sites. Typical requirements are as below:-
  - Type: Standard Outdoor type MS container, fully closed.
  - Dimension: Vendor to decide based on Qty of Analysers & Spares.

General condition:

- 1) The container shall be suitable to store imported and sophisticated components in open environment at thermal power plants. It shall be leak proof.
  - 2) Container shall be provided with proper glass wool thermal insulation at inside.
  - 3) Wall thickness (all sides), reinforcement, supporting lugs, lifting lugs, etc., shall be suitable to store and transport the container with the permissible load as required.
  - 4) Doors shall have suitable latches to lock the container with pad locks for safety purpose.
  - 5) Interior and external surface shall be completely painted as per the standard practice and it shall be Suitable for sea-shore atmosphere.
  - 6) Containers shall be provided with Tag Plates with Project Name.
-

# SECTION I

|                                                                                              |                       |                                           |
|----------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------|
| <br>A4 - 15 | <b>PLANT STANDARD</b> | ED 049 00 99<br>REV NO 10<br>PAGE 0 OF 28 |
|----------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------|

## REVISION HISTORY SHEET

| REV NO. | DATE       | NATURE OF CHANGE                                                | REASONS                                                   | CHANGED BY | APPROVED BY |
|---------|------------|-----------------------------------------------------------------|-----------------------------------------------------------|------------|-------------|
| 00      | 06/03/92   | SUPERCEDS CN43000                                               | -                                                         | VS MAS SHG | N.J         |
| 01      | 19/06/93   | GENERAL                                                         | FEEDBACK FROM QUALITY                                     | SHG        | N.J         |
| 02      | 24/06/93   | CL 3.4.10                                                       | FEEDBACK FROM QUALITY                                     | SHG        | N.J         |
| 03      | 01/07/93   | SEMICONDUCTOR & PHOTOVOLTAIC PANELS ADDED                       | FEEDBACK FROM DESPATCH                                    | SHG        | N.J         |
| 04      | 17/10/94   | TOTALLY REVISED                                                 | FEEDBACK FROM QUALITY                                     | SHG        | N.J         |
| 05      | 08/06/95   | ANNEXURE ADDED                                                  | FEEDBACK FROM QUALITY & ACCEPTANCE CRITERIA OF WOOD ADDED | SHG        | N.J         |
| 06      | 17/11/95   | CL 2.5.10 ALTERED                                               | FEEDBACK FROM QUALITY & SHIPPING                          | SHG        | N.J         |
| 07      | 05/03/97   | UNDER CL 3.0 & 3.9.1 RPP ADDED ACCEPTANCE CRITERIA REMOVED      | FEEDBACK FROM SHIPPING & QC                               | SHG        | N.S         |
| 08      | 29/08/2001 | CL 2.2.8 & 4.1 CHANGED                                          | FEEDBACK FROM SHIPPING & QC                               | SHG        | NS          |
| 09      | 15.12.2009 | INCLUSION OF PINE WOOD AND SOME CLAUSES HAVE AMENDED            | FEEDBACK FROM SHIPPING                                    | PGD / KPN  | MSS         |
| 10      | 21.06.2013 | Inclusion of recommendations pertaining to spares in page-11&28 | Recommendations from Corporate systems & IT               | HRN        | MSS         |

REV-10.

APPROVED: M. Sivaramaiah

PREPARED: HRN

ISSUED: STDS GROUP

DATE: 21/06/13

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## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 1 OF 28

### PROCEDURE FOR PACKING OF CONTROL EQUIPMENTS PRODUCTS USING RUBBER WOOD, SILVER OAK WOOD, PINE WOOD AND CARTONS

- 1.0 SCOPE:** This standard covers the guidelines for packing of Control Equipments, semiconductor devices and Photo voltaic panels/cells.
- 2.0 MATERIALS:**
- 2.1 WOOD:**
- 2.1.1 INLAND:** The wood shall be Rubber wood (*Havea Brasiliensis*) for packing of cubicles, loose items, spares and photovoltaic items meant for customers in India.
- 2.1.2 EXPORT:** Silver Oak (*Grevillea Robusta*) / Pine wood shall be used for packing of cubicles and loose items meant for export.
- 2.2 DIMENSIONS:**
- 2.2.1** Thickness of planks for Front, rear, top and bottom sides and binding, jointing battens shall be 25 +2/-3 mm.
- 2.2.2** Width of all planks including the tongue shall be more than 125 mm after planing, except to adjust total height of item to be packed.
- 2.2.3** Minimum number of planks shall be used for a shook.
- 2.2.4** In any case, only one plank can be of width less than 125 mm, but greater than 100 mm.
- 2.2.5** Horizontal, vertical, diagonal planks shall be given for binding (number of such planks depend on the dimension of panel, as given in Figure-2).
- 2.2.6** External sides of front and rear planks to be planed to facilitate writing of address and other markings.
- 2.2.7** Width of binding planks shall be minimum 100 mm.

REV-10

APPROVED: M. Sivaramaiah

PREPARED: HRN

ISSUED: STDS GROUP

DATE: 21/06/13

|                                                                                                  |                       |                                                   |
|--------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
| <br><br>A4 - 14 | <b>PLANT STANDARD</b> | ED 049 00 99<br><br>REV NO 10<br><br>PAGE 2 OF 28 |
|--------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|

2.2.8 Distance between any 2 binding planks shall be less than 750 mm. As shown in Fig-3, diagonal planks shall be used in between vertical binding planks when distance between inner to inner of vertical planks is more than 750 mm

2.2.9 Distance of the outer edges of these planks from the edge of case shall be less than 250 mm.

2.2.10 Diagonal planks are not required for top planks and width side also, if the width of pallet is less than 750 mm.

2.2.11 **Jointing of planks:** Single length planks shall be used for cubicles whose overall length is less than 2400 mm. For cubicles of length more than 2400 mm, jointing is permitted. The jointing shall be done with one single or maximum of 2 planks of wood same as other planks of width 250 mm (minimum) with two rows of nails on either side of the joint in zigzag manner. From the joint along height side it shall be of lap joint with over lap of at least the width of plank.

2.2.12 **Tongue and Groove joints:** Two Consecutive planks shall be joined by tongue and groove joint. Depth of tongue shall be  $12 \pm 1$  mm, thickness of tongue shall be  $8 \pm 1$  mm. The groove dimensions shall be such that the tongue fits tightly into the groove to make a good joint.

2.3 **PERMISSIBLE DEFECTS:** - Wood shall be free from knots, bows, visible sign of infection and any kind of decay caused by insects, fungus, etc.

*End splits:* Longest end splits at each end shall be measured and lengths added together. The added length shall not exceed 60 mm per meter run of shock's. Wood pins shall be used to prevent further development of split.

*Surface cracks:* Surface cracks with a maximum depth of 3 mm are permissible. A continuous crack of any depth all along the length is not allowed.

## 2.4 .0 CHEMICAL TREATMENTS FOR PRESERVATION OF WOOD:-

2.4.1 This treatment provides protection to the packing wood against deterioration due to fungi and attack by termites, borers and marine organism and any kind of infections.

2.4.2 The wooden planks, after making tongues / grooves shall be treated with chemicals. For pine wood, treatment with ASCU/ CCA solution need not be done.

2.4.3 The chemical used shall be ready mix ASCU paste. This consists of Arsenic pentoxide, copper sulphate sodium dichromate. This Paste shall be mixed at the rate of 1 kg of paste per 10 liters of water to the extent of water used. Alternate this CCA paste as mentioned at Para 2.4.5 can also be used.

2.4.4 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

|                                                                                              |                       |                                                   |
|----------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
| <br>A4 - 14 | <b>PLANT STANDARD</b> | ED 049 00 99<br><br>REV NO 10<br><br>PAGE 3 OF 28 |
|----------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|

shall be prepared in the presence of BHEL- EDN's Representative by contractor. The wooden planks 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. 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 before mixing will be got 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 paste shall be tested as and when required.

#### 2.4.5 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 Pent oxide                              | $As_2O_5 \cdot 2H_2O$                         | 12.5 |
| Copper Sulphate                                 | $CuSO_4 \cdot 5H_2O$                          | 37.5 |
| Sodium Dichromate<br>Or<br>Potassium Dichromate | $Na_2Cr_2O_7 \cdot 5H_2O$<br><br>$K_2Cr_2O_7$ | 50.0 |

#### 2.5 OTHER MATERIALS:

2.5.1 NAILS: The dia. of the nails shall be 3.15 mm. The length of the nails shall be 65 mm wherever two planks of 25 mm thickness are joined and 75 mm wherever a 25 mm plank is joined to a 50 mm plank.

2.5.2 BLUE NAILS: These are used for nailing bituminized Kraft paper/hessian cloth to the planks. The length of the nails shall be 16 mm.

2.5.3 HOOP IRON STRIPS: These are used for strapping the boxes. The width of the strips shall be  $19 \pm 1$  mm and thickness  $0.6 \pm 0.01$  mm. The material shall be free from rust.

2.5.4 CLIPS: These shall be used for strapping the hoop iron strips on the boxes.

2.5.5 BRACKETS: These brackets are used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of thickness  $2 \pm 1$  mm and width  $25 \pm 1$  mm. The brackets shall be of "L" shape, the length of each side being  $100 \pm 2$  mm. Two holes shall be provided towards the end of each side for screwing /nailing.

|                                                                                              |                       |                                           |
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| <br>A4 - 14 | <b>PLANT STANDARD</b> | ED 049 00 99<br>REV NO 10<br>PAGE 4 OF 28 |
|----------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------|

2.5.6 FASTENERS: Bolts, double nuts, spring washers will have to be used for packing of some special items like transformers, reactors, breakers, etc., to hold the job to the bottom plank of the box. The bolts, nuts, washers will be provided by BHEL. However, drilling of holes will have to be done using contractor's tools.

2.5.7 POLYETHYLENE SHEET: The polyethylene sheets are used to make covers to the jobs individually. The material shall have a thickness of 0.175 mm (175 microns). The polyethylene sheet shall be clear and transparent.

2.5.8 BITUMINISED WATER PROOF KRAFT PAPER: This is used for lining the inside of shoots of cubicles.

2.5.9 BITUMEN COATED HESSIAN POLYETHYLENE KRAFT PAPER: This is used for lining the inside of top planks of cubicles and for lining of all inner sides of boxes.

2.5.10 RUBBERISED COIR: The rubberized coir is used as cushioning material. For the packing of loose items, items are to be arrested by using rubberized coir. For the packing of cubicles rubberized coir of thickness 25mm and width 75mm shall be used.

2.5.11 FOAM RUBBER / 'U' FOAM: This is used for covering the delicate items. This material is normally provided by BHEL.

2.5.12 THERMOCOL (EXPANDED POLYSTYRENE) SHEETS: This is used for covering delicate items. This material is normally provided by BHEL.

2.5.13 MARKING PLATE: This shall be of anodized aluminum sheet. Details and specifications are given in Fig-5.

2.5.14 PACKING SLIP HOLDER: This shall be of galvanized iron /tinned

2.5.15 SILICA GEL: This shall be of indicating type.

2.5.16 COTTON BAGS: These are used for holding silica gel. The bags shall have the following matter indicated them:

-----  
BHEL-EDN, BANGALORE - 5 60 026

SILICA GEL INDICATING TYPE

BLUE : ACTIVE

ROSE : REDUCED ACTIVITY

WHITE : NO ACTIVITY. TO BE REPLACED WITH FRESH SILICA GEL  
-----



## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 5 OF 28

2.5.17 COTTON/ PLASTIC TAPE: This is used for tying small items .And also to prevent vibrations of moving parts within the cubicles.

2.5.18 MARKING INK: The ink used normally is black in color. In some special cases other color also will have to be used. The ink shall be non-fading/indelible and non-washable by water.

2.5.19 POLYETHYLENE BAGS: These are to be used for keeping the, Packing slips. The bag shall be of size 70 mm X 100 mm (minimum).

2.5.20 Hessian cloth, twine thread, paint will have to be used in packing certain items.

2.5.21 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. [Refer Drawing Fig-7]. For reusable boxes, these clamps provide easy locking and unlocking arrangement. These clamps will be made available from BHEL in some cases.

**3.0 PACKING SPECIFICATIONS:** Different types of packing are used as follows:

- 1) Packing of cubicles with rubber wood.
- 2) Packing of cubicles with Silver Oak wood / Pine wood
- 3) Packing of empty cubicles with rubber wood.
- 4) Packing of loose items/spares with rubber wood.
- 5) Packing of loose items /spares with Silver Oak wood.
- 6) Packing of Photo-voltaic items with rubber wood.
- 7) Packing using bitumen coated hessian polyethylene Kraft papers.
- 8) Supply of rubber wood pallets for empty cubicles.
- 9) Packing of semiconductor panels.
- 10) Packing of material covered under category of RPP (Registered Postal Parcel)
- 11] Packing of materials using PVC [sunspace] / corrugated Kraft paper cartons.
- 12] Packing of materials using heavy duty cartons

**3.1 PACKING OF CUBICLES WITH RUBBER WOOD:**

3.1.1 The packing is to be done as per clause 2.0 in all respects.

3.1.2 The cubicles are already fixed on wooden pallets. Hence the contractor need not arrange the bottom pallets normally.

3.1.3 The cubicles will be of different sizes both widthwise and lengthwise. The cubicles may be made up of single suite, 2 Suite, 3 Suite, 4 Suite, etc., The width of the cubicles generally varies from 400 mm to 1650mm. The length of the cubicle, generally varies from 1500 mm to 4800 mm. The height is normally 2430 mm. In some cases the height may be less/more.

|                                                                                   |                       |                                                   |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
|  | <b>PLANT STANDARD</b> | ED 049 00 99<br><br>REV NO 10<br><br>PAGE 6 OF 28 |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|

- 3.1.4 BITUMINISED WATER PROOF KRAFT PAPER: The inner surface of 4 sides of shok's shall be nailed with Bituminized water proof Kraft paper (as per 2.5.8) using blue nails (as per 2.5.2) wherever 2 pieces of Kraft paper are used, the joint shall have an overlap of minimum 20 mm.
- 3.1.5 BITUMEN COATED HESSIAN POLYETHYLENE KRAFT PAPER: The inner surface of top cover shall be nailed with Bitumen coated Hessian polyethylene Kraft paper (as in 2.5.9). This sheet shall project outside on 4 sides by at least 100 mm and shall be nailed properly on sides. Joining of sheets should have overlap of minimum 20 mm.
- 3.1.6 POLYETHYLENE SHEET COVERING: The cubicles shall be covered with a polyethylene petticoat (Polyethylene sheet as per 2.5.7). This shall be 'tailor made' to fit the cubicle. The sealing shall be such as not to allow any moisture to enter the cubicle.
- 3.1.7 SILICA GEL: Silica gel (as per 2.5.15) packed in cotton bags shall be kept at different places inside the cubicle as per EDN directions. Each suit of cubicle shall be provided with 1 kg of Silica gel (for a 4 suit cubicle 4 kgs of Silica Gel to be used. The bag containing silica gel to be as per 2.5.16).
- 3.1.8 LOOSE PARTS: Any loose parts in the cubicles shall be tied using cotton/ plastic tape. Wooden battens shall be provided wherever necessary.
- 3.1.9 WOODEN BATTENS: 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.
- 3.1.10 RUBBERISED COIR: Gap between the cubicle and the case shall be filled with rubberized coir (as per 2.5.10) with distance between consecutive layers less than 500 mm.
- 3.1.11 CLAMPING: Packing shall be bound at edges by nailing M.S.clamps / Brackets (as per 2.5.5). Each vertical edge shall have minimum 3 clamps. Top horizontal edges will have one clamp for every meter length of package. However, minimum 4 clamps shall be nailed at the top for any cubicle.
- 3.1.12 PACKING SLIP: Packing slip kept in the polyethylene bag (As per 2.5.19) shall be placed in the box at appropriate place. In addition, one more packing slip covered in polyethylene cover and packing slip holder (as per 2.5.14) shall be nailed to front / rear of case.
- 3.1.13 MARKING PLATE: One no. (As per 2.5.13) shall be nailed to the front side of the case.
- 3.1.14 CASE MOUNTING: After complete packing, stencil marking of various details and marking of symbols shall be done as per BHEL instructions using indelible / non washable marking ink.

|                                                                                   |                       |                                           |
|-----------------------------------------------------------------------------------|-----------------------|-------------------------------------------|
|  | <b>PLANT STANDARD</b> | ED 049 00 99<br>REV NO 10<br>PAGE 7 OF 28 |
|-----------------------------------------------------------------------------------|-----------------------|-------------------------------------------|

3.2 PACKING OF CUBICLES WITH SILVER OAK / PINE WOOD: Packing of cubicles for export shall be done exactly in same manner as described at 3.1 except for the following changes: -

- Wood shall be Silver oak/ Pine wood instead of rubber wood.
- Double polyethylene petticoat instead of one.
- Fumigation may have to be done if required ( BHEL Scope).

3.3 Different types of Cubicles with sizes for Packing

SL TYPE OF CUBICLE VARIANT DIMENSIONS [Internal sizes]

|                         |                      |
|-------------------------|----------------------|
| 01 Single suite cubicle | - 900 x 950 x 2500   |
| 02 Two suite cubicle    | - 1650 x 950 x 2500  |
| 03. Three suite cubicle | - 2400 x 950 x 2500  |
| 04. Four suite cubicle  | - 3150 x 950 x 2500  |
| 05. Regulation cub      | - 1300 x 1350 x 2500 |
| 06. Thy cub             | - 2870 x 1350 x 2500 |
| 07. VFD Cub             | - 3800 x 1550 x 2500 |

3.4 PACKING OF LOOSE ITEMS/SPARES USING RUBBER WOOD:

3.4.1 Shape of cases shall be square, rectangular with single gabled roof or with double gabled roof depending on the nature of the job to be packed. Construction shall be as per drawings enclosed. Only gable will be additional as required.

3.4.2 Wood shall be rubber wood with Tongue and Groove joint as per clause 2.2.12.

3.4.3 Chemical treatment as per clause 2.4 to be done.

3.4.4 Width of planks shall be at least 100 mm. Width of binding planks (battens) shall be at least 75mm.

3.4.5 External surface of planks on front and rear shall planed 100% (except bottom plank).

3.4.6 Inner surfaces of all 6 sides shall be lined with bitumen coated hessian polyethylene Kraft paper (as per clause 2.5.9) using blue nails.

3.4.7 Rubberized coir of minimum 25mm thickness and 100 mm width shall be nailed to inner surfaces of bottom and 4 sides of box.

3.4.8 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 rubberized coir to get proper cushioning effect.



## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 8 OF 28

3.4.9 Certain items like transformers, reactors, breakers, etc., shall be bolted to the bottom of the box using bolts, nuts and washers.

3.4.10 Silica gel as per clause 2.5.15 held in cotton bags as per clause 2.5.16 shall be kept at proper places in the box.

| SL NO | BOX INNER DIMENSIONS (mm) | VOLUME (liters) | QUANTITY OF SILICA GEL (grams) |
|-------|---------------------------|-----------------|--------------------------------|
| 1     | 300X300X300               | 27              | 100                            |
| 2     | 400X400X400               | 64              | 100                            |
| 3     | 500X500X400               | 100             | 100                            |
| 4     | 600X600X400               | 144             | 100                            |
| 5     | 700X700X400               | 196             | 100                            |
| 6     | 770X770X500               | 297             | 100                            |

3.4.11. Packing slip kept in polyethylene bag (clause 2.5.19) shall be placed in the box.

3.4.12. Marking plate as per clause 2.5.13 shall be nailed to side of the box.

3.4.13. Two numbers of hoop iron strips as per clause 2.5.3 shall be strapped tightly on the case using clips.

3.4.14. Stencil marking of various details and marking of various symbols shall be done as per BHEL instructions using indelible/non-washable marking ink.

3.4.15 Loose items to be kept inside the cubicle

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

|                                                                                   |                       |                                                   |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
|  | <b>PLANT STANDARD</b> | ED 049 00 99<br><br>REV NO 10<br><br>PAGE 9 OF 28 |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|

3.5. PACKING OF LOOSE ITEMS USING SILVER OAK / PINE WOOD: Packing of loose items for export shall be done in same manner as at clause.3.4 . except for the following changes:

- Wood shall be Silver oak/ Pine wood instead of rubber wood.
- Fumigation may have to be done.
- 2 polyethylene covers to be provided.

3.6 PACKING OF PHOTO VOLTAIC PANELS, ETC.USING RUBBER WOOD:  
Same as 3.4 above except for the following changes:

- Wood need not be treated with chemical solution.
- Tongue and groove jointing is not required. But planks shall be so joined as to not leave any gap at the joint. Bituminized Kraft paper and Bituminized Kraft sheet need not be used.
- Silica gel need not be used.

3.7 PACKING USING BITUMEN COATED HESSIAN POLYETHYLENE KRAFT PAPER:

3.7.1. This method is adopted for packing of poles, frames, Empty boxes, etc.

3.7.2. Job shall be covered and stitched tightly with bitumen coated hessian polyethylene Kraft paper.

3.7.3. Marking has to be done as mentioned in CL 3.4.14.

3.8 SUPPLY OF RUBBER WOOD PALLETS FOR EMPTY CUBICLES:

3.8.1. The wood shall be rubber wood.

3.8.2. Thickness of planks shall be 25  $\pm$ 2 mm. The size of the supporting battens at bottom shall be 75  $\pm$ 2 mm (width) and 100 $\pm$ 2 mm (height).

3.8.3. If t he width of t he pallet is 1000 mm or less, only 2 supp orting battens at the edges may be provided. In case of pall ets having width of more than 1000 mm, one extra supporting batten shall be provided in the middle.

3.8.4. Jointing of top planks i s not permitted for pallets of wi dth less than 1000mm. For pallets of width more than 1 000 mm, jointing of t op plank is permitted. However, j oint shall be at the center of the supporting batten.

|                                                                                   |                       |                                            |
|-----------------------------------------------------------------------------------|-----------------------|--------------------------------------------|
|  | <b>PLANT STANDARD</b> | ED 049 00 99<br>REV NO 10<br>PAGE 10 OF 28 |
|-----------------------------------------------------------------------------------|-----------------------|--------------------------------------------|

3.8.5 The consecutive top planks shall be so nailed as to leave no gap. Tongue and groove joint is not required.

### 3.9 PACKING OF SEMICONDUCTOR DEVICES

Semiconductor devices shall be received in prepackaged condition as per the device type and packed in plywood boxes as per the following procedure,

- Provide thermocole sheets/rubberized coir.
- Stack the preplaced devices inside the case.
- Fill up gaps with thermocol sheets/rubberized coir.
- Close the top cover and nail.
- Provide suitable marking of the package details.

3.9.1 Packing of material for Registered Post Parcel (RPP) RPP packing boxes to be made in-house with 12mm (for sides) and 6mm thick (for top and bottom) commercial quality ply wood sheet. The size of the box should be decided on the material to be dispatched. Between material 10mm and 15mm thick thermocole sheets or rubberized coir/foam should be provided as cushion.

3.9.2. Packing of materials using sunpac cartons and corrugated Kraft paper cartons: Individual items can be packed using sunpac or polypropylene [PVC]/corrugated Kraft paper cartons of suitable sizes and grammage depending upon the items to be packed. Heavy duty cartons can also be used for packing of loose items, manuals, repaired items and others.

3.9.3. Packing of materials using Heavy duty cartons: Panels can also be packed using Heavy duty carton with other required packing materials having 2000gsm corrugated board of 7 ply 15 thick. Loose items and spares can be packed using 5ply 2000gsm corrugated heavy board with other packing materials. Different sizes of cartons are required depending upon the sizes of the items being packed. Details are separately given.

### 4.0 ADDITIONAL POINTS TO BE FOLLOWED FOR EXPORT ORDER SEAWORTHY PACKING:

4.1 Packing to be done as per Fig - 6.  
Thickness of G.I. sheet 0.3 mm. plus or minus 0.05 [0.3-0.05]

**Additional points to be taken care for :**

|                                                                                   |                       |                                                    |
|-----------------------------------------------------------------------------------|-----------------------|----------------------------------------------------|
|  | <b>PLANT STANDARD</b> | ED 049 00 99<br><br>REV NO 10<br><br>PAGE 11 OF 28 |
|-----------------------------------------------------------------------------------|-----------------------|----------------------------------------------------|

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

| 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  | i) Initial spares Box / Container to be labeled as "INITIAL SPARES " in RED. Ref fig: 14 (Page-26).<br>ii) O & M spares Box /Container to be labeled as" O&M SPARES " in GREEN. Ref fig: 14 (Page-26).                                                                                                                                                          |
| 4  | iii) Initial Spares Box to have red Color strip as per diagram. Ref fig: 14 (Page-26).<br>iv) Majority of spares (initial and O&M) are for indoor storage at site.<br>v) O&M spares box to have green Color strip as per diagram. Ref fig: 14 (Page-26).                                                                                                        |
| 5  | vi) Spares (Initial and O&M ) Packing list kept inside the boxes and affixed securely outside the box to contain<br>vii) Custom name<br>viii) Project / Power station Name<br>ix) Customer PO No and date<br>x) Sl no of customer PO.<br>xi) Quantity total & dispatched.<br>xii) Unit work order number<br>xiii) All above to be developed from Unit IT System |
| 6  | xiv) All spares (Initial and O&M) items to have tags (wono, item customer order no, customer item.description)                                                                                                                                                                                                                                                  |
| 7  | 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. |



## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 12 OF 28

### 5.0 DETAILS OF DRAWINGS/FIGURES ENCLOSED

FIG-1: Details Of Cubicle Packing Box

FIG-2: Binding Of Panel

FIG-3: Lifting Of Packed Case

NOTE: 1) Spreaders are to be used only for lifting the case.

2) Spreaders are wooden items & not nailed to the case.

3) Height between crane hook & spreaders to be kept Minimum to void rotation of case while lifting.

FIG-4: Lifting And Moving Un Packed Case

FIG-5: Marking Plate

FIG-6: Closed Packing Case With G.I. Sheet Showing Layers Of Packing Materials.

FIG-7: Mechanical Latching Clamp

FIG-8 to 15 : Sample Packing drawing of single/ double / triple & four suit pane.l



A4 - 14

## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 13 OF 28

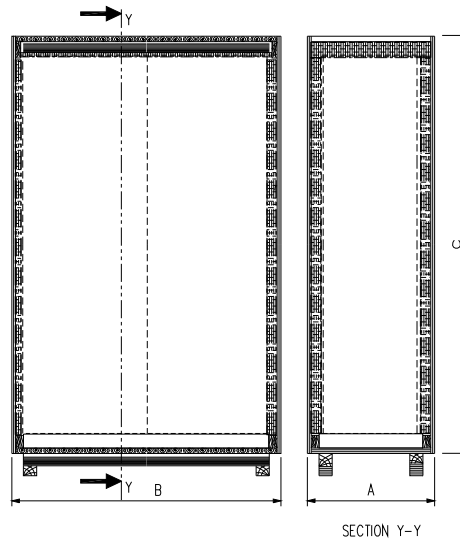


FIG-1 : DETAILS OF CUBICLE PACKING BOX.



## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 14 OF 28

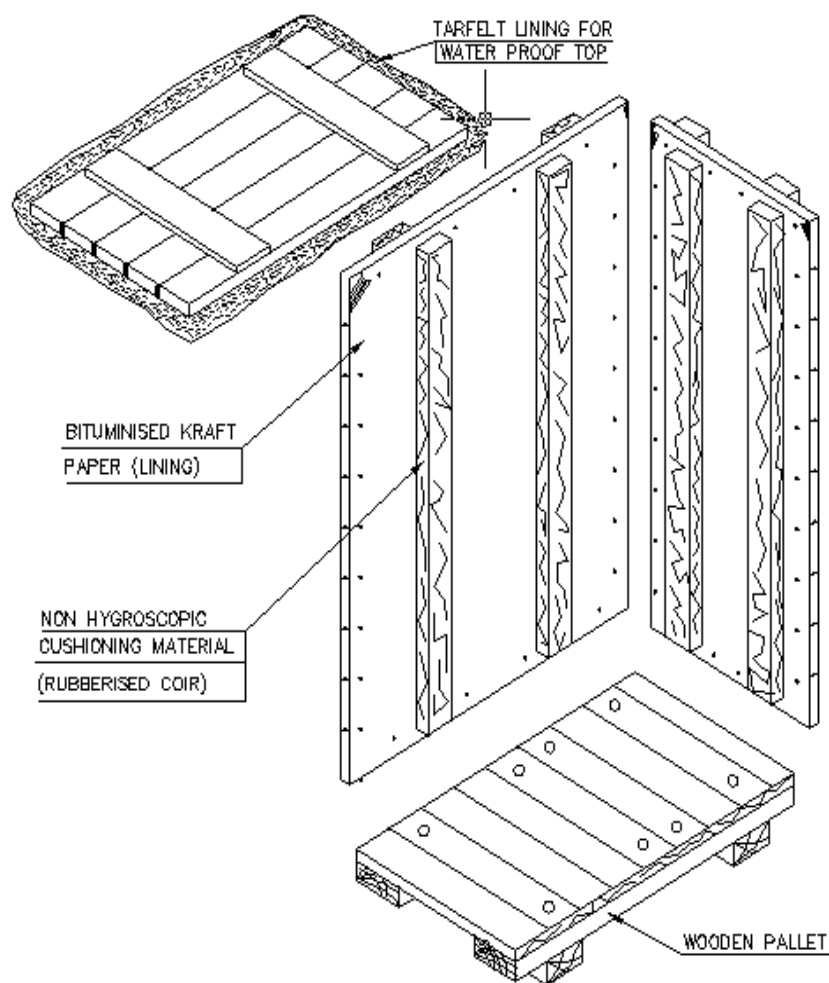


Fig. 2 : Binding of Panel



A4 - 14

## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 15 OF 28

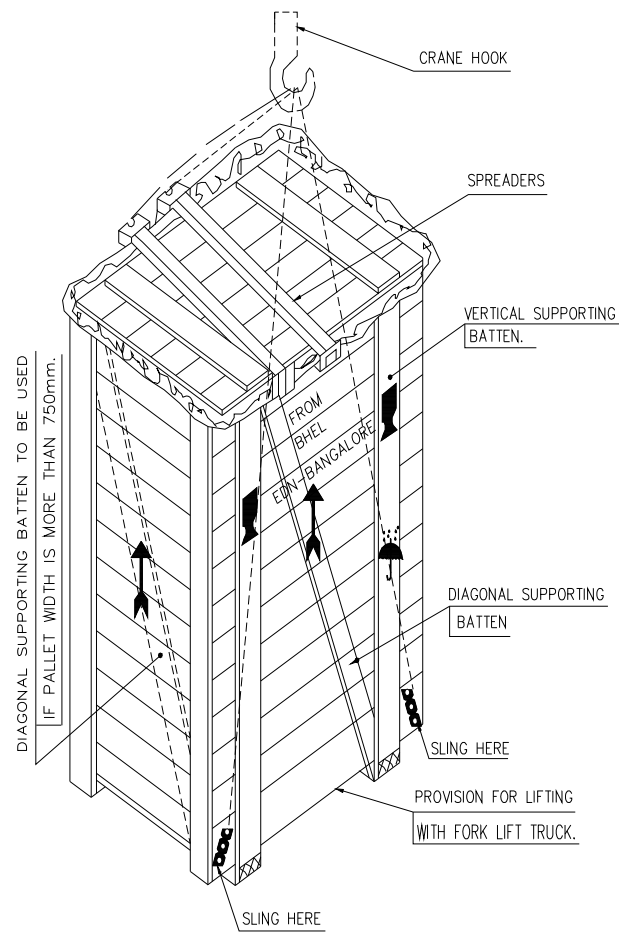


FIG-3 : LIFTING OF PACKED CASE.



A4 - 14

## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 16 OF 28

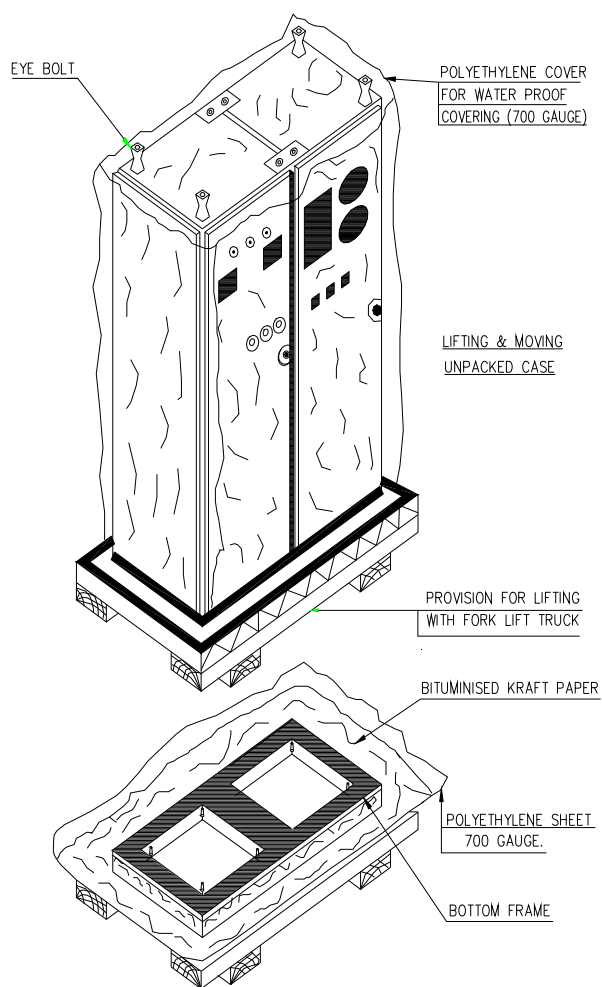


FIGURE-4

|                                                                                                  |                              |                                                           |
|--------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------|
|  <p>A4 - 14</p> | <p><b>PLANT STANDARD</b></p> | <p>ED 049 00 99</p> <p>REV NO 10</p> <p>PAGE 17 OF 28</p> |
|--------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------|

|                                                                                     |  |                                                          |  |  |  |  |          |                |  |                  |  |
|-------------------------------------------------------------------------------------|--|----------------------------------------------------------|--|--|--|--|----------|----------------|--|------------------|--|
|  |  | BHEL-EDN-BANGALORE-26                                    |  |  |  |  |          |                |  |                  |  |
|                                                                                     |  |                                                          |  |  |  |  |          |                |  |                  |  |
| CONSIGNEE                                                                           |  |                                                          |  |  |  |  |          |                |  |                  |  |
| MATERIAL                                                                            |  |                                                          |  |  |  |  |          |                |  |                  |  |
| CUSTOMER REF.                                                                       |  |                                                          |  |  |  |  | MO. NO.  |                |  |                  |  |
| DESPATCH<br>ADVICE NO.                                                              |  |                                                          |  |  |  |  | CASE NO. |                |  |                  |  |
| DIMENSIONS(MM)<br>LXBXH                                                             |  |                                                          |  |  |  |  |          | NET<br>WT -KGS |  | GROSS<br>WT -KGS |  |
| SPECIAL<br>INSTRUCTIONS                                                             |  | HANDLE WITH CARE - KEEP DRY<br>DO NOT DROP - DO NOT TILT |  |  |  |  |          |                |  |                  |  |

225

170

FIG-5 : MARKING PLATE.



A4 - 14

## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 18 OF 28

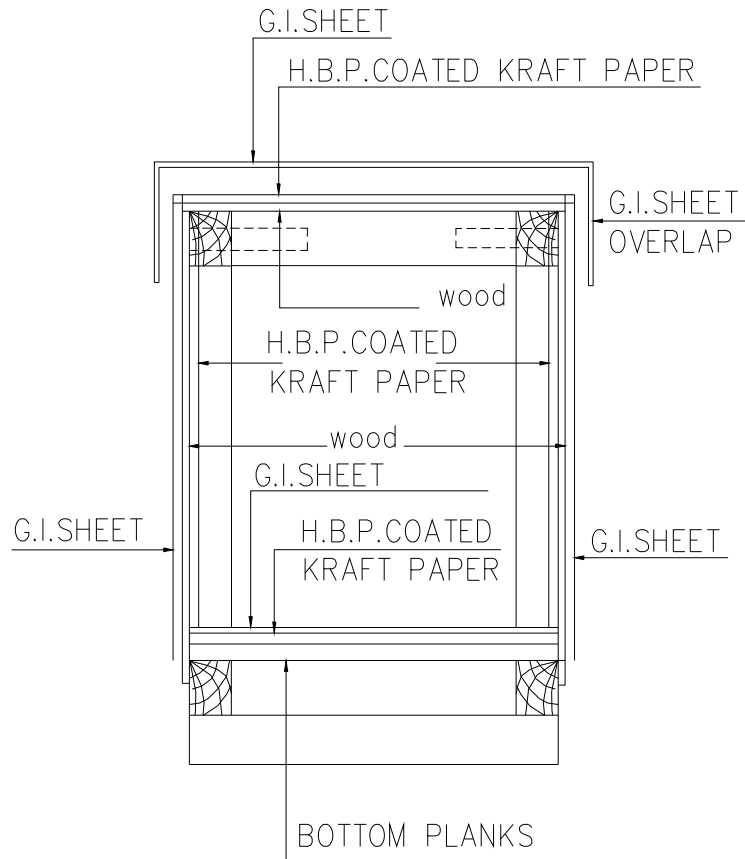


FIG-6 : CLOSED PACKING CASE WITH G.I.SHEET  
SHOWING LAYERS OF PACKING MATERIALS.

## ED 049 00 99

REV NO 10

PAGE 19 OF 28



### **Fig – 7 : Mechanical Latching Clamp**

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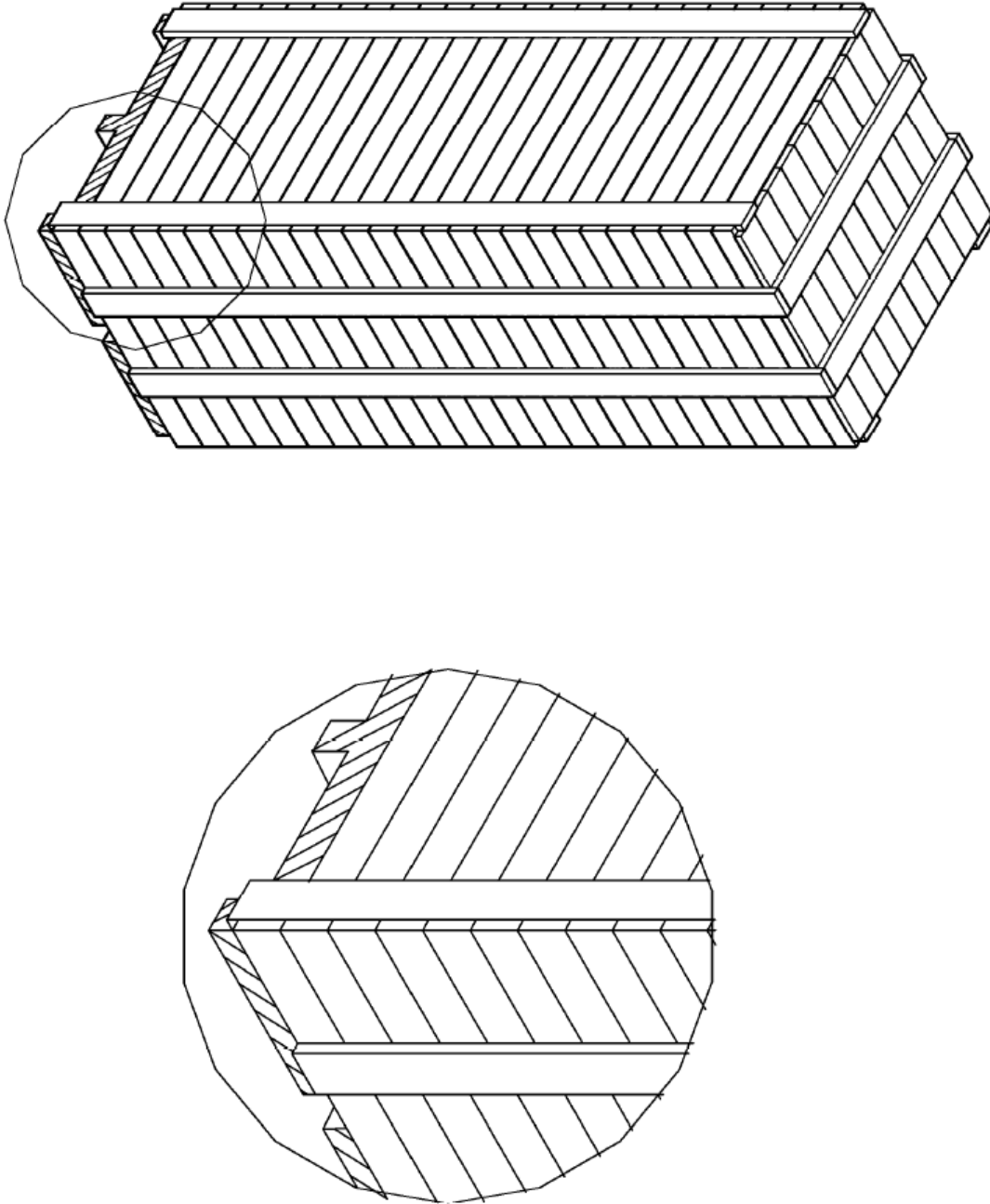


## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 20 OF 28



**Fig – 8 : Single Suit Cubicle Packing View**

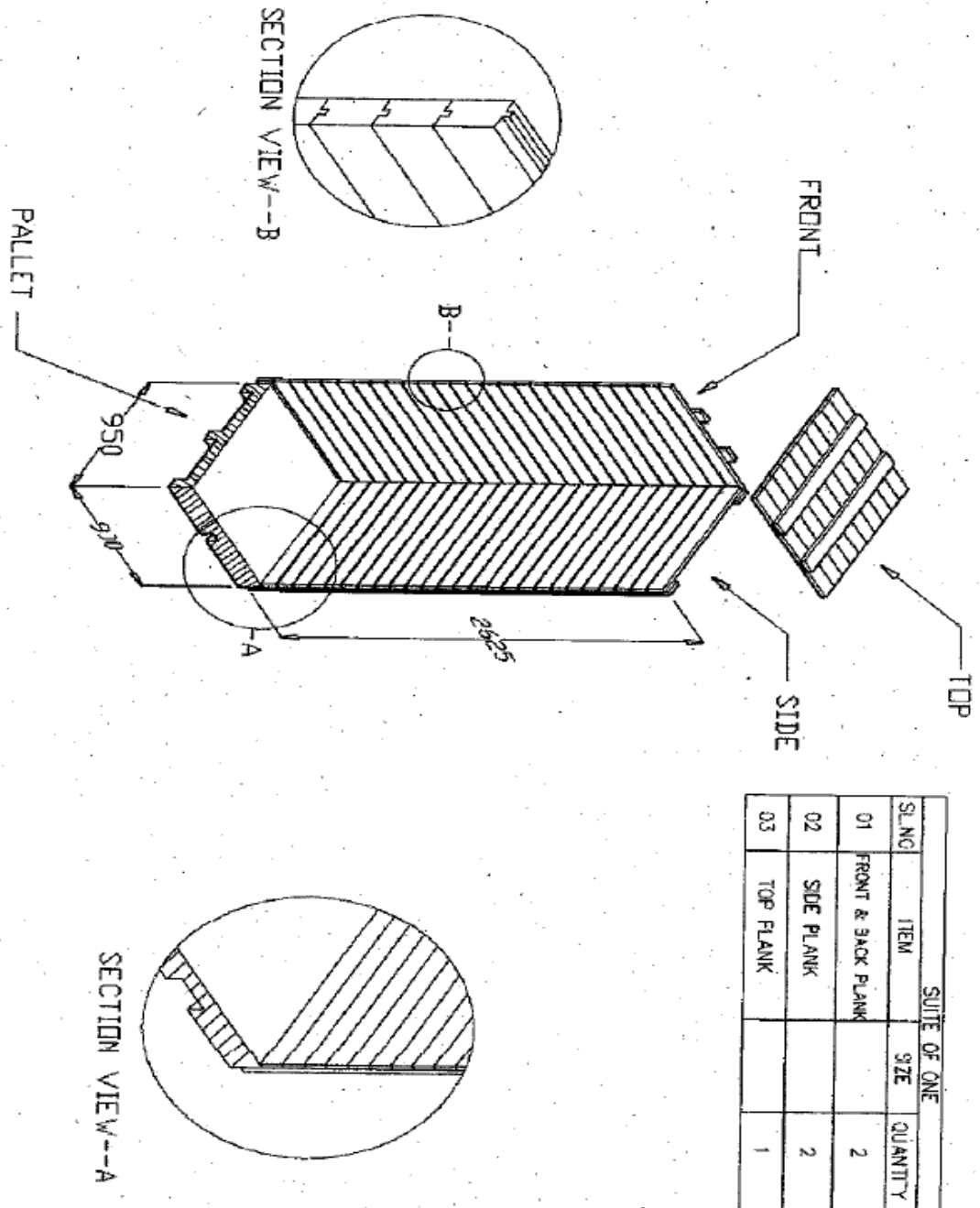


## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 21 OF 28



**Fig – 9 : Single Suit Packing Assembly Drawing**

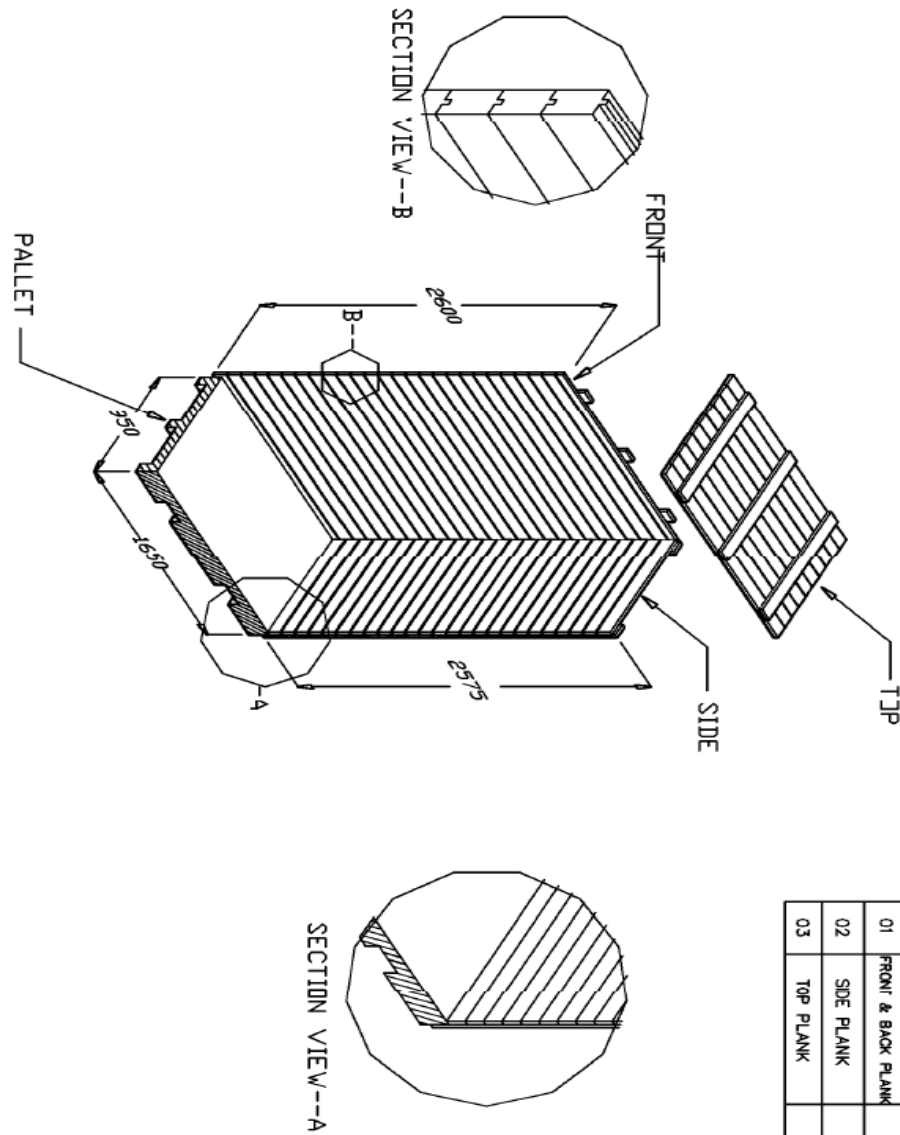


## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 22 OF 28



| SUITE OF ONE |                    |      |          |
|--------------|--------------------|------|----------|
| S/L NO       | ITEM               | SIZE | QUANTITY |
| 01           | FRONT & BACK PLANK |      | 2        |
| 02           | SIDE PLANK         |      | 2        |
| 03           | TOP PLANK          |      | 1        |

**Fig – 10 : Two Suit Packing Assembly Details**

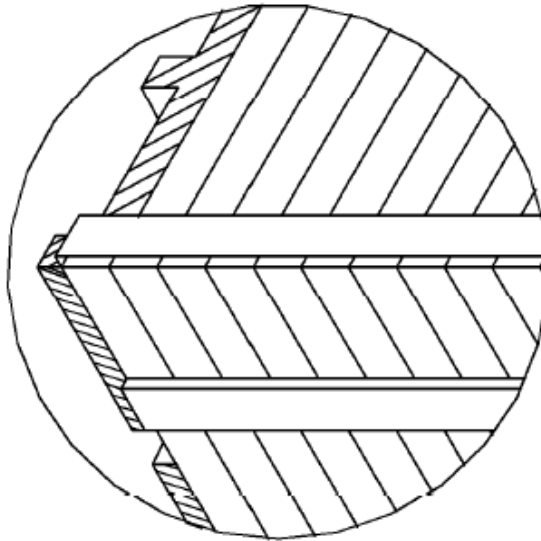
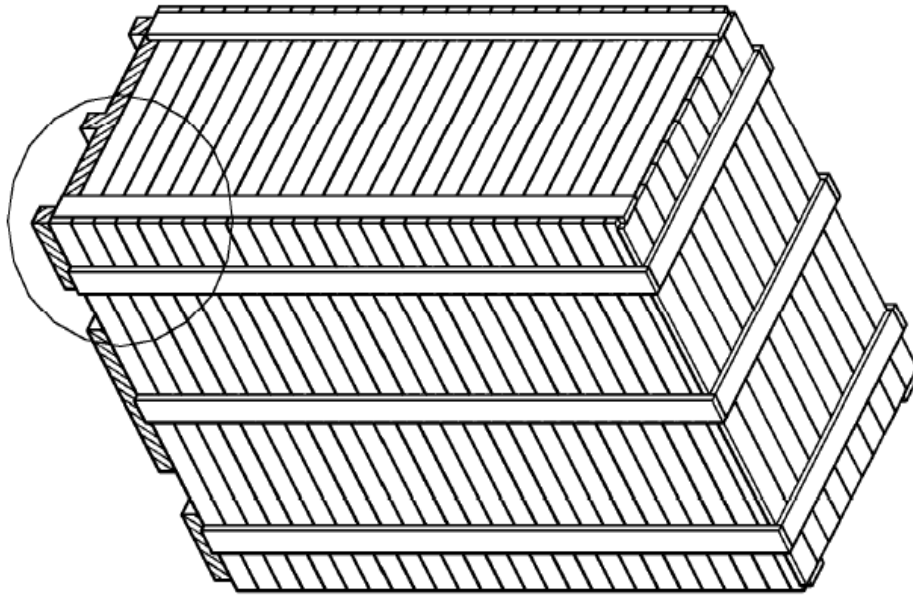


## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 23 OF 28



**Fig – 11 : Two Suit Panel Packed view**



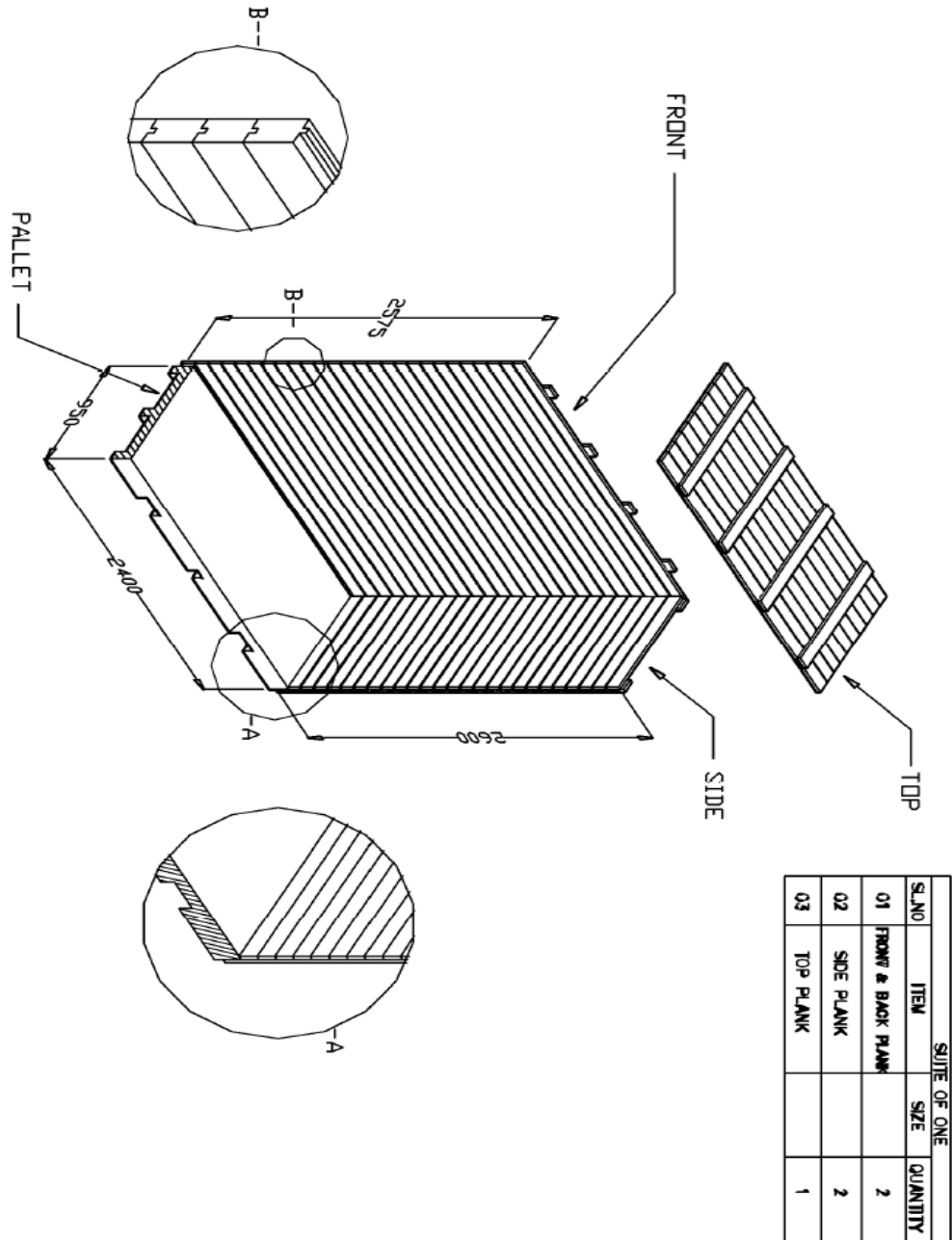
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ED 049 00 99

REV NO 10

PAGE 24 OF 28

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**Fig – 12 : Three Suit Panel Packing Assembly View**

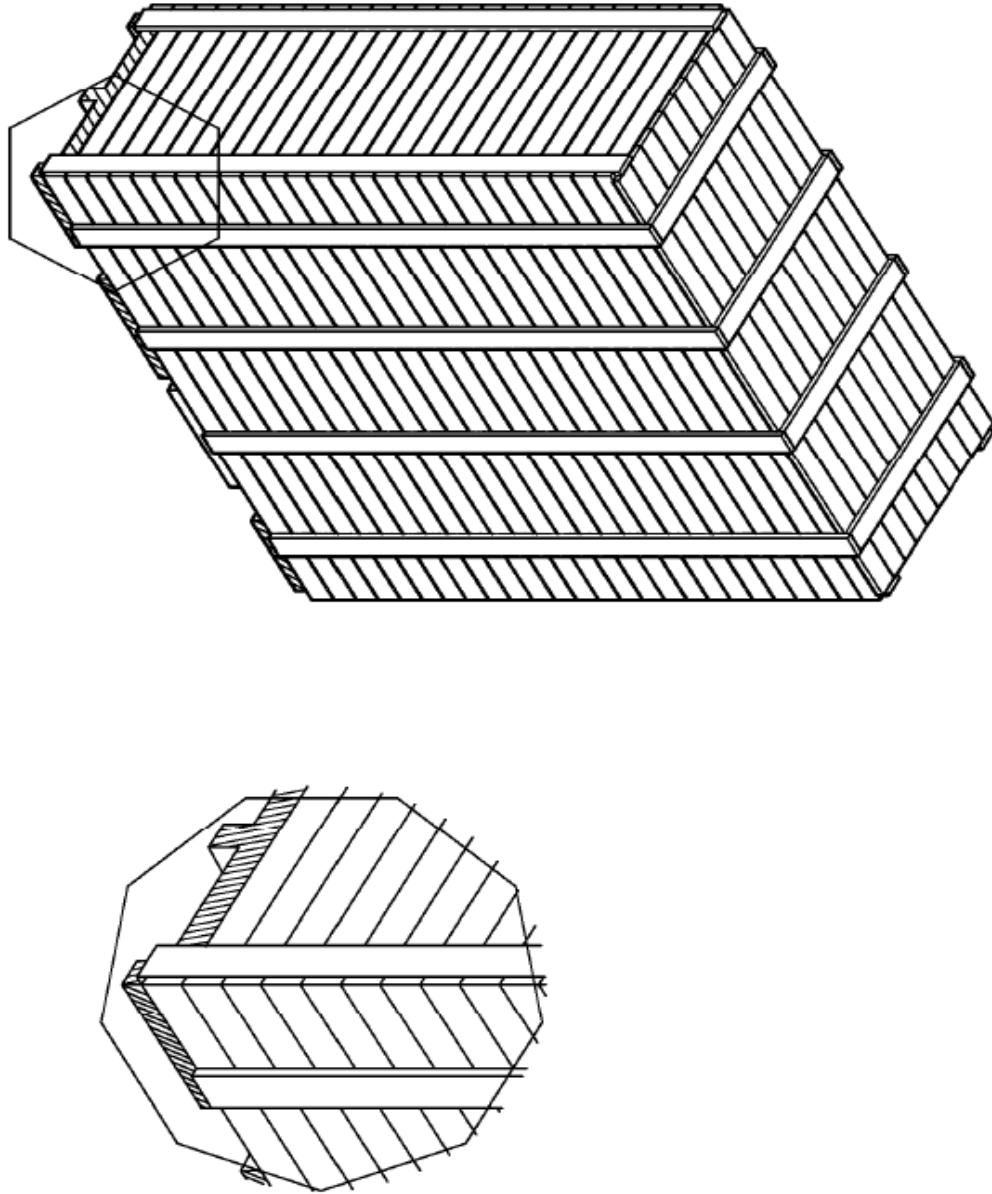


## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 25 OF 28



**Fig -13 : Three Suit Panel Packed View**

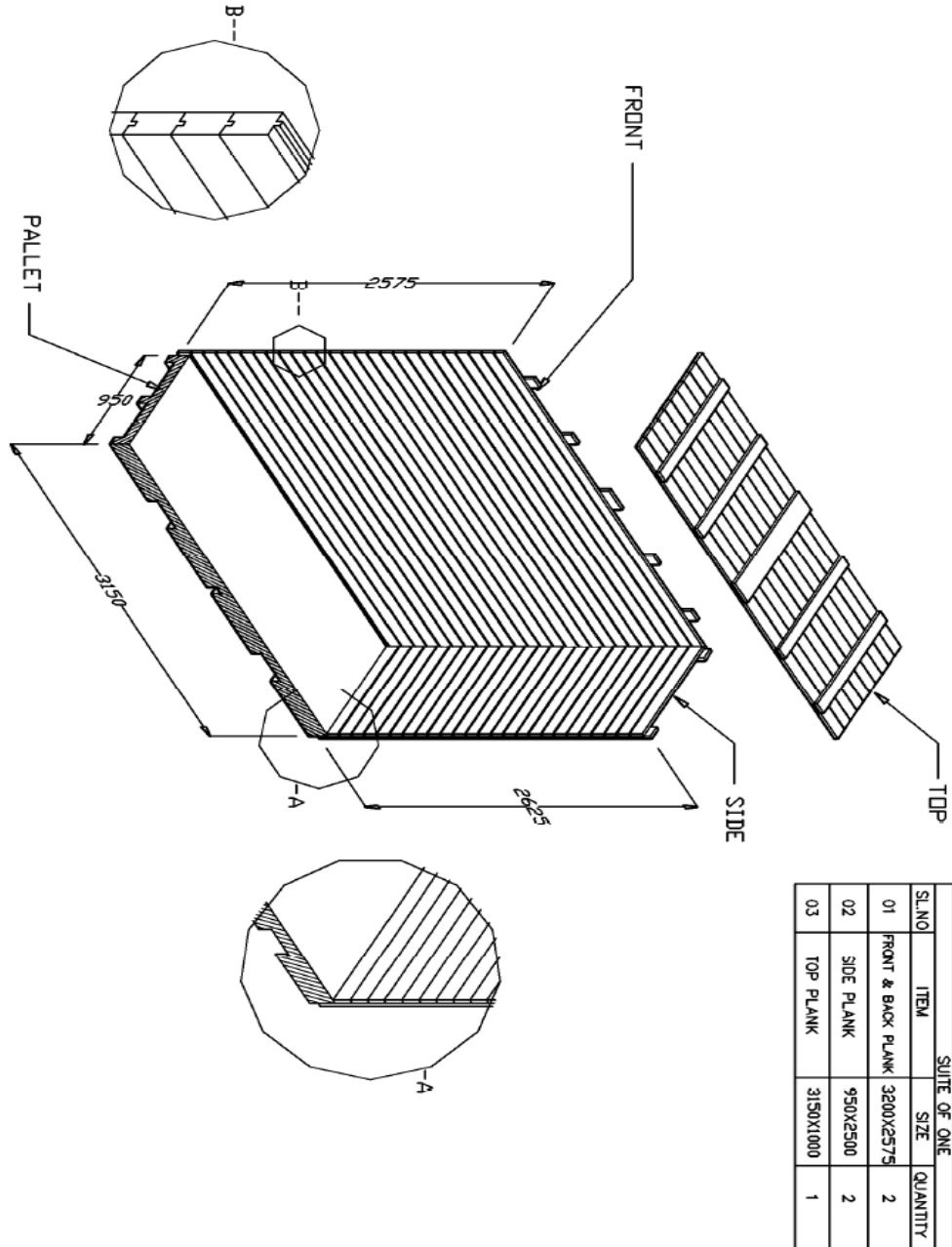


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ED 049 00 99

REV NO 10

PAGE 26 OF 28



**Fig – 14 : Four Suit Panel Packing assembly Detail**

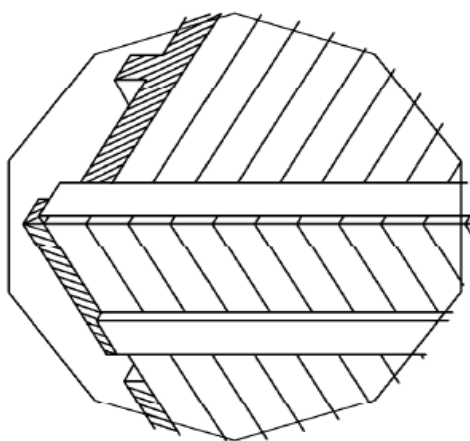
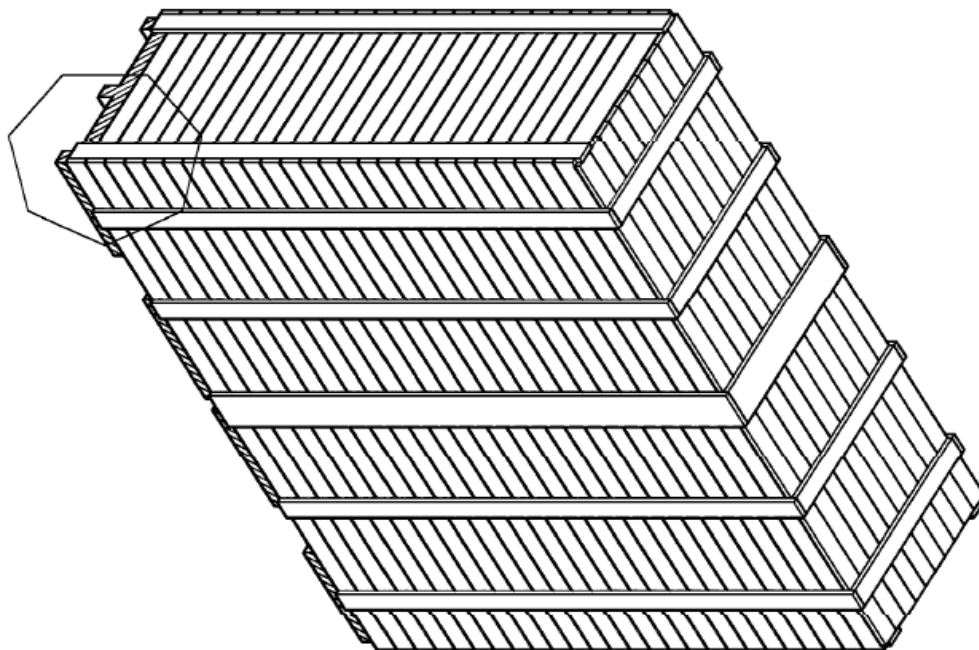


## PLANT STANDARD

ED 049 00 99

REV NO 10

PAGE 27 OF 28



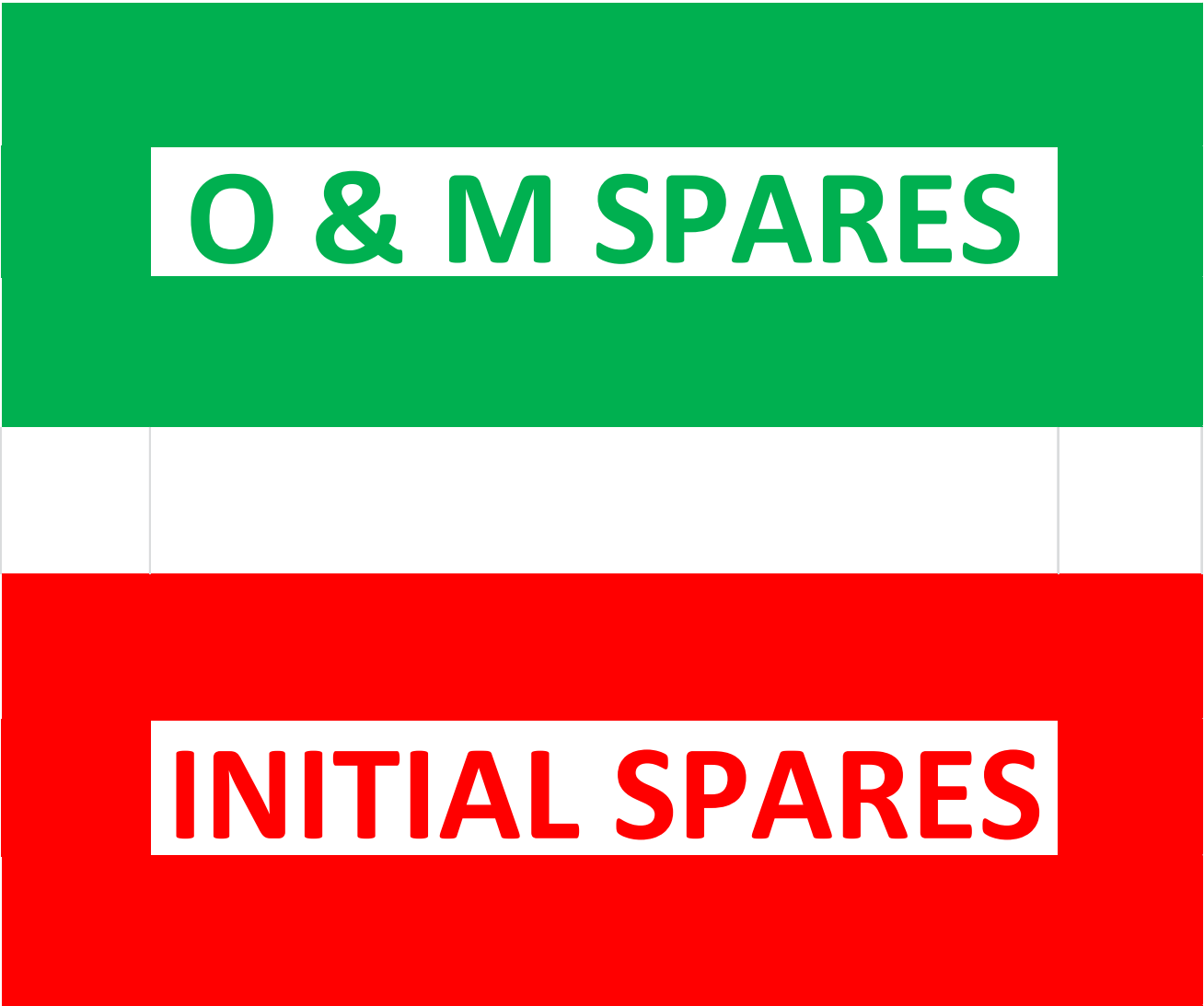
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**Fig -15 : Four Suit Panel Packing View**

|                                                                                   |                              |                                                           |
|-----------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------|
|  | <p><b>PLANT STANDARD</b></p> | <p>ED 049 00 99</p> <p>REV NO 10</p> <p>PAGE 28 OF 28</p> |
|-----------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------|

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

Fig: 14



**ENGINEERING CHECKLIST****PROJECT: KOTHAGUDEM R&M 2X250 MW****Important Note: Bidders to Mandatorily fill the below checklist (with Company seal and Signature) otherwise offers shall be rejected.**

| Sl. No. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                           | NOT CONFIRMED<br>(If applicable Please Tick<br>Mark 'V') | CONFIRMED<br>(If applicable Please Tick<br>Mark 'V') |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|
| 1       | "Bidder shall have successfully completed design, engineering, procurement, manufacturing, shop testing, erection and commissioning of SWAS, which had guaranteed and trouble free performance has been proven at least for 1(One) year as on bid opening date of this tender, in a Powerplant of min. 200 MW and above".                             |                                                          |                                                      |
| 2       | Compliance to Each point in PQR                                                                                                                                                                                                                                                                                                                       |                                                          |                                                      |
| 3       | All Analysers shall have 2 x 4-20 mA, galvanically isolated outputs and relay contacts for alarms shall be provided as per Specs.                                                                                                                                                                                                                     |                                                          |                                                      |
| 4       | MICROPROCESSOR BASED WITH DIGITAL COMMUNICATION FACILITY RS485 on Modbus protocol shall be provided to all the Analysers.                                                                                                                                                                                                                             |                                                          |                                                      |
| 5       | All offered analyser shall be suitable for 240 V supply & shall be 4 wire analysers.                                                                                                                                                                                                                                                                  |                                                          |                                                      |
| 6       | Mandatory spares shall be offered against each line item of the specs. If any item is not available meeting the description of the specs, then functionally equivalent item shall be offered against that line item.                                                                                                                                  |                                                          |                                                      |
| 7       | Pl. furnish the cell constants for each Tag No. and confirm that in the event of any change in cell constant required during approval stage, same shall be done without any commercial implication.                                                                                                                                                   |                                                          |                                                      |
| 8       | All sample wetted parts & Sampling tubes shall be SS316 material.                                                                                                                                                                                                                                                                                     |                                                          |                                                      |
| 9       | Primary Racks shall be with IBR certified Isolation & IBR certified Blowdown Valves & IBR certified Cooler Coils of Inconel material                                                                                                                                                                                                                  |                                                          |                                                      |
| 10      | Pl. confirm that offer includes high pressure reducing valve in the primary rack for all High Pr. Samples (>100 Kg/cm2)                                                                                                                                                                                                                               |                                                          |                                                      |
| 11      | Packing shall be as per corporate standard indicated in Specs.                                                                                                                                                                                                                                                                                        |                                                          |                                                      |
| 12      | Pl. confirm that all analyzers shall be provided with all consumables & reagents required for 12 months operation after commissioning of system.                                                                                                                                                                                                      |                                                          |                                                      |
| 13      | All items with limited shelf life shall be supplied during commissioning only. If any items require replacement due to expiry of shelf life, same shall be replaced without any commercial implication to BHEL-EDN (Such as Tygon tube, pH Cells, DO sensors, Reagents).                                                                              |                                                          |                                                      |
| 14      | All headers in Primary racks & Wet Panel shall be supplied with suitable sized counter and mating flanges. In addition to this, 1 set of mating & counter flanges shall be provided for all the cooling water headers for connecting to tapping point in field.                                                                                       |                                                          |                                                      |
| 15      | Pl. confirm that all components/accessories required to meet the intent of the specification shall be offered. 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 |                                                          |                                                      |
| 16      | Pl. confirm that for tubing between wet and dry panel suitable DFDC connectors shall be provided                                                                                                                                                                                                                                                      |                                                          |                                                      |
| 17      | Pl. confirm that Insulation of Pipe between Chiller and wet panel shall be done at site.                                                                                                                                                                                                                                                              |                                                          |                                                      |
| 18      | Pl. confirm that stream selector shall be with pulse based selection.                                                                                                                                                                                                                                                                                 |                                                          |                                                      |
| 19      | Mandatory Spares shall be sent in pre-decided lots in containers /secure boxes distinctly marked in Red colour with boldly written "S" mark on each face of the containers /secure boxes.                                                                                                                                                             |                                                          |                                                      |
| 20      | Items used for SWAS system shall be from Approved vendors indicated in Specs. For items not covered in the list bidders approved vendors will be acceptable.                                                                                                                                                                                          |                                                          |                                                      |
| 21      | Site work for both Analysers & Sample Handling system shall be as per Scope of Supply                                                                                                                                                                                                                                                                 |                                                          |                                                      |
| 22      | If offered Models of Analysers are not accepted during document approval, same shall be replaced by Analyser models of customer approved vendors without any commercial impact.                                                                                                                                                                       |                                                          |                                                      |
| 23      | Primary & Secondary cooler shell drain shall be valved and piped to waste drain header as per Specs.                                                                                                                                                                                                                                                  |                                                          |                                                      |
| 24      | Loose supply item such as cabling and tubing shall be calculated by considering the Total Qty of Analyser for both the units (2 Units) and 30 Meter per run.                                                                                                                                                                                          |                                                          |                                                      |
| 25      | At later stage if it is found that vendor offer is not in line with tender specification then vendor to supply material in line with tender specification without any price impact to BHEL.                                                                                                                                                           |                                                          |                                                      |