

OPEN TENDER CHECKLIST

SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES

AND MANDATORY SPARES

FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT

(INTERNATIONAL ORDER)

Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT 53022)

Sl. No.	Document Name	Vendor Confirmation (Filled and Signed copy to be submitted along with Techno Commercial Offer)
01	Annexure A COVERING LETTER	Submitted ☐ Not Submitted ☐
02	Annexure B GENERAL TERMS & CONDITIONS (FOR GUIDANCE TO THE SUPPLIERS)	Submitted ☐ Not Submitted ☐
03	Annexure C COMMERCIAL TERMS AND CONDITIONS	Submitted ☐ Not Submitted ☐
04	Annexure D UN PRICED /PRICE OFFER FORMAT - INDIGENOUS	Submitted ☐ Not Submitted ☐
05	Annexure E SPECIFICATION DEVIATION DISPOSITION REPORT	Submitted ☐ Not Submitted ☐
06	Annexure F CEBG	Submitted ☐ Not Submitted ☐
07	Annexure G Online SRF	Submitted ☐ Not Submitted ☐
08	Annexure H TERMS AND CONDITIONS FOR OFFER	Submitted ☐ Not Submitted ☐
09	Annexure I PAYMENT MECHANISM	Submitted ☐ Not Submitted ☐
10	TECHNICAL SPECIFICATION FOR CARBON DI OXIDE DOSING SYSTEM - ROS 6295 REV 00 DATE 14.05.2020	Submitted ☐ Not Submitted ☐
11	TECHNICAL SPECIFICATION FOR ELECTRICAL, CONTROL & INSTRUMENTATION – ROS 4366 REV 00 DATE 20.05.2019	Submitted ☐ Not Submitted ☐
12	PRE-QUALIFICATION REQUIREMENT FOR CARBON DI OXIDE DOSING SYSTEM - CO2 SYS : MAITREE REV 00 DATE 18.05.2020.	Submitted ☐ Not Submitted ☐
13	ANNEXURE C SEAWORTHY PACKING SPEC. PE TS 888 100 A001 REV 00.	Submitted ☐ Not Submitted ☐
14	ANNEXURE B - PAINTING	Submitted ☐ Not Submitted ☐

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AND MANDATORY SPARES
FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT
(INTERNATIONAL ORDER)

Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT 53022)

Sl. No.	Document Name	Vendor Confirmation (Filled and Signed copy to be submitted along with Techno Commercial Offer)
15	ANNEXURE H – P & ID CARBON DI OXIDE DOSING SYSTEM	Submitted ☐ Not Submitted ☐
16	ANNEXURE M – MANDATORY SPARES FOR CARBON DI OXIDE DOSING SYSTEM	Submitted ☐ Not Submitted ☐
17	QAP / QP / MQP Customer Sample Format	Submitted ☐ Not Submitted ☐
18	ANNEXURE – Q FOR QAP / QP / MQP	Submitted ☐ Not Submitted ☐



Bharat Heavy Electricals Limited

Boiler Auxiliaries Plant

RANIPET – 632 406, Tamil Nadu, India

PURCHASE – WATER SYSTEM

ANNEXURE - A
SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES
AND MANDATORY SPARES
FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT
(INTERNATIONAL ORDER)

Enquiry No.: 7700124E Dated 25-MAY-2019 (NIT_ 53022)

Due on: 16-JUN-2020

To All [Manufacturers & Suppliers only.](#)

Dear Sir,

Please submit your lowest quotation on FIRM PRICE, in duplicate subject to our terms & conditions in the various annexures attached and herein for the below listed materials so as to reach us on or before the due date by 2.00 p.m.

[Requirement with Delivery date-FOR SUPPLY: DESTINATION - FOR RANIPET STORES](#)

Enquiry Sl. No.	Description & material Code	Unit	Qty.	Delivery Date
001	RWT009420001 CARBON DI OXIDE DOSING SYSTEM AND ALL ACCESSORIES AS PER TECHNICAL SPECIFICATION NO. ROS 6295 REV 00 DATE 14.05.2020 ROS 4366 REV 00 DATE 20.05.2019 & RELEVANT ANNEXURES.	ST	1.00	Supply completion on or before 31.12.2020 or 6 Months from the date of CAT-I Approval / Manufacturing clearance, whichever is Later.
002	RWT00950001 MANDATORY SPARES FOR CARBON DI OXIDE DOSING SYSTEM AS PER TECHNICAL SPECIFICATION NO. ROS 6295 REV 00 DATE 14.05.2020 ROS 4366 REV 00 DATE 20.05.2019 & ANNEXURE B	ST	1.00	



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BIDDERS SHALL CAREFULLY READ THE FOLLOWING ANNEXURES / NOTES AND SHALL QUOTE THEIR BEST COMPETITIVE PRICE.

PLEASE REFER TO - COMMERCIAL DOCUMENTS

1. **ANNEXURE-B FOR GENERAL TERMS & CONDITIONS (FOR GUIDANCE TO THE SUPPLIERS)**
2. **ANNEXURE-C FOR COMMERCIAL TERMS AND CONDITIONS**
3. **ANNEXURE-D PRICE BID FORMAT FOR THE SUPPLY**
4. **ANNEXURE-E SDDR FORMAT**
5. **ANNEXURE-F CEBG FORMAT**
6. **ANNEXURE-G ONLINE SUPPLIER REGISTRATION FORM**
7. **ANNEXURE H TERMS AND CONDITIONS FOR OFFER**
8. **ANNEXURE I PAYMENT MECHANISM**

TECHNICAL ENCLOSURES AS PER FOLLOWINGS:

- 1) **ROS 6295 REV 00 DATE 14.05.2020 - TECHNICAL SPECIFICATION FOR CARBON DI OXIDE DOSING SYSTEM,**
- 2) **ROS 4366 REV 00 DATE 20.05.2019 - TECHNICAL SPECIFICATION FOR ELECTRICAL, CONTROL & INSTRUMENTATION**
- 3) **CO2 SYS : MAITREE REV 00 DATE 18.05.2020 - PRE-QUALIFICATION REQUIREMENT FOR CARBON DI OXIDE DOSING SYSTEM**
- 4) **ANNEXURE B - PAINTING,**
- 5) **ANNEXURE H – P & ID CARBON DI OXIDE DOSING SYSTEM,**
- 6) **ANNEXURE M – MANDATORY SPARES FOR CARBON DI OXIDE DOSING SYSTEM,**
- 7) **ANNEXURE C - SEAWORTHY PACKING SPEC. PE TS 888 100 A001 REV 00.**
- 8) **QAP / QP / MQP CUSTOMER SAMPLE FORMAT**
- 9) **ANNEXURE – Q FOR QAP / QP / MQP & INSPECTION.**

Important Instruction to Bidders:

1. All the items will be procured from a single vendor only & all the Items will be compared on SET Basis & Order will be placed on a Single vendor who is the lowest (L1) on set basis. Hence please quote for all the complete items including services. Incomplete offers will be rejected.
2. Vendors shall go through the “Qualification Requirement” & furnish Qualification Data sheet duly filled in along with Techno-Commercial offer. Offers received without this requirement will be summarily rejected & such offers will not be processed further.
3. Price bid opening will be considered subject to techno commercial confirmation and acceptance by BHEL, Ranipet & also approval from our customer: M/s. BIFPCPL- MAITREE STPP 2 X 660 MW PROJECT.
4. Price Bid opening will be done through e-mode / Reverse Auction method (English method) which will be decided after techno-commercial bid evaluation is completed

➤ TENDER SHALL BE SUBMITTED IN TWO PARTS AS REFERRED IN ANNEXURE-B.

➤ ANY REVISED OFFER(S) SENT BY VENDORS ON THEIR OWN, AFTER THE TENDER OPENING, WILL BE TREATED AS "UNSOLICITED OFFER". SUCH OFFERS WILL NOT BE CONSIDERED AND NECESSARY ACTION AS DEEMED FIT WILL BE TAKEN BY BHEL ON THOSE VENDORS. HENCE COMPETITIVE OFFER TO BE GIVEN IN THE ORIGINAL QUOTE ITSELF.

IMPORTANT NOTE:



Bharat Heavy Electricals Limited

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RANIPET – 632 406, Tamil Nadu, India

PURCHASE – WATER SYSTEM

TENDERS ARE INVITED THROUGH ELECTRONIC MODE FROM ELIGIBLE SUPPLIERS IN CASE OF OPEN TENDERS AND FROM SUPPLIERS TO WHOM THE ENQUIRY IS ADDRESSED IN CASE OF LIMITED / SINGLE TENDER.

THE OFFERS SHALL BE POSTED INTO THE SYSTEM BEFORE THE DATE AND TIME SPECIFIED IN THE TENDER.

THE OFFER SHALL BE SENT ON ~~SINGLE PART~~ / TWO PART / ~~THREE PART~~ BASIS AS SPECIFIED IN THE MAIN TENDER DOCUMENT.

BIDS SHALL BE SUBMITTED THROUGH E-PROCUREMENT PORTAL, <http://bhel.abcprocure.com> OF M/S E-PROCUREMENT TECHNOLOGIES LTD - www.abcprocure.com WHO ARE OUR SOLUTION PROVIDER..

01) OFFERERS ARE REQUESTED TO CAREFULLY READ THE FOLLOWING CONDITIONS AND GIVE THEIR SPECIFIC CONFIRMATION OF ACCEPTANCE IN TOTO.

2A) TIME IS THE ESSENCE OF CONTRACT.

2B) IN THE EVENT OF DELAY ON THE CONTRACT DELIVERY, LIQUIDATED DAMAGES (LD) WILL BE LEVIED.

2C) LD WILL BE LEVIED AT THE RATE OF 0.5 % PER WEEK OR PART THEREOF ON THE CONTRACT VALUE.

2D) THE LD CEILING WILL BE 10 %.

2E) LD WILL BE A MANDATORY CONDITION IN THE PURCHASE ORDER.

3) IF NO CONFIRMATION OR COMMENTS ARE INCLUDED IN THE INITIAL OFFER BY THE TENDERER, IN THE EVENT OF PLACEMENT OF ORDER, THE ORDER WILL BE RELEASED WITH THE STANDARD LD CONDITION GIVEN ABOVE.

4) THE CONDITION WILL BE INCLUDED IN THE ORDER WITHOUT ANY FURTHER REFERENCE TO THE OFFERER AND NO CHANGES WILL BE PERMISSIBLE, POST ORDER RELEASE.

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**ANNEXURE –B**  
**GENERAL TERMS & CONDITIONS**  
**(FOR GUIDANCE TO THE SUPPLIERS)**

**A] Submission of Offer**

**a) Invitation for bid**

Tenders are invited through electronic mode from eligible suppliers in case of open tenders and from suppliers to whom the enquiry is addressed in case of Limited / Single Tender.

The offers shall be posted into the system before the date and time specified in the tender.

The offer shall be sent on single part / two part / three part basis as specified in the main tender document.

Bids shall be submitted through e-Procurement portal, <https://bhel.abcprocure.com> of M/s e-Procurement Technologies, Ahmedabad who is our solution provider.

**b) Hardware and Software requirements for participating in e-tender**

Requirement for participating in e-Procurement is as under:

- i) A Computer with internet connectivity (Internet Explorer 9.0 (32-bit Browser only) & above)
- ii) Digital Signature Certificate (Class 3- SHA2-2048 BIT- with both Signing and Encryption component separately).
- iii) JAVA (Version 1.8 Update 45).
- iv) Steps for Hardware and software configuration is detailed at <https://bhel.abcprocure.com/EPROC/> under title “Minimum system requirements and Settings Document for BHEL User and Bidders”.

**c) Instructions for Registered Suppliers**

For all types of tenders (Single / Limited / Open) an automated email alert regarding issue of the Tender will be sent by the e-procurement portal to all Suppliers registered with BHEL, Ranipet for the item/s for which the tender is issued.

In case of open tenders, Registered suppliers with registered DSC will have to login with their user id/password & DSC and search for the Open Tender. To participate in event and to submit bid, a bidder needs to agree the terms and conditions.

Registered suppliers without DSC will have get their profiles approved by mapping DSC after login.

To know the procedure for obtaining Digital Signature Certificate (DSC), suppliers who are not having the DSC are advised to visit our website [www.bhel.com](http://www.bhel.com) → Tender Notifications → Sample Checklist.

**d) Instructions for new suppliers wishing to bid against open tenders**

New, unregistered suppliers wanting to bid against open tender/s will have to first register themselves in <https://bhel.abcprocure.com> as new supplier by clicking the “Register” button.

After entering the Income Tax Permanent Account Number (PAN) details and pressing “Enter”, they have to select the respective BHEL Unit for which they want to participate in the Open Tender and also fill up other relevant Company information as a one-time activity. On successful registration, your profile will be approved by the authorized officer and you can login to portal and can participate in the procurement event.



To participate in a tender, you need to login to the portal. You must be an approved registered user. If you are not a registered user, you can register yourself by clicking upon the “Register” link. You need to have a valid vendor code and password to login to the portal. Enter your Vendor code, password and click on Login button after Login, you need to select your digital signing and encryption certificates certificate. The DSC will be approved by M/s e-Procurement Technologies/ Authorised officer of BHEL.

As required by the tender, the necessary documents have to be filled-in online, in the provided template. Additional documents required are to be scanned and uploaded as .pdf file. Suppliers are advised to take note that the maximum space that is provided for uploading the documents that are to be attached is 300 MB. However the size of an individual document cannot exceed 10 MB. For any clarification on submission of offer on line, attention of the Supplier/s is invited to our document “Bidder Manual for BHEL Bidders” hosted in the home-page of the e-procurement portal. During normal business hours, helpline maintained by the service provider M/s e-Procurement Technologies is available for clarifying any doubts of supplier/s. The helpline numbers are +91-79-40270599/508/560/590/513 and email id is: [Bhel.Support@abcProcure.com](mailto:Bhel.Support@abcProcure.com) . Bidder can also refer to “Bidder Manual for BHEL Bidders” hosted in the home-page of the e-procurement portal <https://bhel.abcprocure.com>.

Typical documents that would be required as part of tender submission would be

- a) **Complete technical Offer** with details, catalogues, as applicable.
- b) **Un-priced bid** (i.e. Bid without the Price) as per given format, if any.
- c) **Filled-in BHEL’s Standard Terms & Conditions** as per Annexure enclosed with the Tender Document,
- d) **Deviation summary** submitted in two parts – giving the summary of technical deviations separately and the commercial deviations separately, if any and
- e) **Supporting documents** to substantiate equivalent material specifications / sections, where quoted for.
- f) Where asked for, **Client list** with their full address including detail of contact person with phone no., fax no. & e-mail ID (if any) to whom the same / similar items are supplied in the past two years. The date of supply may also be indicated, against each client.
- g) Suppliers can also upload their credentials by way of submission of Performance certificate/s issued by their customer/s detailing the quantity supplied and specification along with the un-priced PO copies and proof of supply along with the offer.

**Technical acceptance of offer by BHEL shall be based on the evaluation of offer and the submitted documents.**

- h) **Bidders who are not already registered with BHEL Ranipet** are requested to submit the Supplier Registration Form (SRF) online (<http://supplier.bhel.in/>) for evaluating and registering as an approved vendor. The Supplier Development Cell (SDC) of BHEL, Ranipet would process the SRF for evaluation / registering the Supplier. Don’t send hardcopies of SRF to BHEL-Ranipet, **only** online submission is accepted. This registration process is a separate / parallel activity and do not mix-up with submission offers.

#### **Note**

- (i) The materials offered, shall conform to the specification and scope attached in the tender.
- (ii) In case the offered materials are not conforming to the Enquiry material Specification, such offers would not be considered for evaluation and would be rejected.



Where equivalent specifications are offered, considering such offers will be at the sole discretion of BHEL. Wherever alternative standards / specifications are offered by Bidder, the Bidder shall provide sufficient documentary evidence to ensure equivalence to the designated standards / specifications, failing which the offer would be considered as not technically acceptable and hence shall stand rejected.

(iii) All taxes and duties payable as extra to the quoted price should be specifically stated in offers (as appearing in the online template).

Offer/s from within India shall be submitted along with the applicable HS Number and the applicable Goods & services Tax (GST) for each quoted item, failing which the purchaser will not be liable for payment of such taxes and duties. Our GST No: **33AAACB4146P2ZL**.

(iv) The un-priced bid shall be used to indicate relevant commercial terms such as scope of freight and insurance, applicability of duties and taxes etc. All Commercial terms are to be indicated clearly in the offer.

(vi) No changes shall be entertained once the bid is opened unless otherwise specifically agreed to in writing by BHEL.

(vii) Money values other than for those items appearing in the un-priced bid template shall not be indicated anywhere in the un-priced bid.

(viii) Time required for inspection (at Supplier's works), should be clearly given in terms of numbers of working days.

(x) **Offers sent by FAX / E-mail:** would not be entertained.

(xi) 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.

(xii) Registration process for items required by BHEL is always open at <https://supplier.bhel.in>. Prospective suppliers (including MSEs & owned by SCs/STs) may visit this site and apply for registration in the respective Unit.

**Price Bid** in conformance with the specification and terms as given in the Un-Priced bid document.

**Caution on submission of price bids thru EPS:**

*The suppliers are severely cautioned to note that the price bid document accepts the price in figures only. It does not allow the supplier to write the value by words. Therefore all care shall be exercised by the supplier while filling in the figures. Once the price bid is opened no option is available for the supplier to retract the offer under any grounds. If a supplier, for any reason whatsoever approaches BHEL with a request for change in the price, it would be treated as going back on the offer submitted. In such cases, action would be initiated by BHEL for suspending further business dealings with such suppliers as per policy of BHEL which prevails at that point of time.*

**Foreign / Overseas suppliers are hereby informed that offers with differential currencies are not permitted for a given tender document.**

**Note**

(i) The price break-up should be in line with technical specification / scope of the tender. (Cost of material, packing charges, forwarding charges, freight and insurance charges shall be shown appropriately, as applicable).



- (ii) Unless otherwise specified as a part of the tender condition, No Price Variation Clause will be entertained and No advance payment will be made by BHEL.
- (iii) In case, there is a discrepancy in the term quoted in techno-commercial bid and price bid, the term as per the techno-commercial bid (Part I) shall hold good and the commercial term quoted in the Price Bid (Part II) shall not be considered.
- (iv) In their own interest, all Tenderers are advised to double check their prices, applicable duties and taxes.
- (v) The quotation should be valid at least for a period of 90 days from the tender opening date.
- (vi) Indian bidders should submit the prices in Indian Rupees only.
- (vii) Foreign bidders may submit their bid in foreign currency. The currency for quoting shall be selected from the drop-down menu provided.
- (x) Indian Suppliers shall quote on FOR Destination basis only. Destination is BHEL, Ranipet Stores or BHEL Project Site as specified in the tender requirement. Foreign Suppliers shall quote on CFR Chennai Seaport Delivery and Insurance will be in BHEL's scope. No other delivery terms shall be acceptable. Shipment shall be arranged by the Seller on *Liner in / Liner out basis*. As per Government of India guidelines, BHEL Ranipet being a Government of India Undertaking the Bill of Lading shall be made with the Shipper as "Government of India". This shall be specifically confirmed by the Bidder.
- (xi) Where the cargo is containerized, Container washing charges, stuffing charges and / or any other such charges would be to the account of the supplier, where the containers are to be stuffed at the works of the supplier.

## **B] Opening of Offers**

**a) Tenders can be submitted up to 1400 Hours on tender opening due date. Part I will be opened on the same day at 1430 Hours. Results of the tender opening will be available for viewing for upto 7 days from the date of opening.**

**b) Requests by Bidders for extension of due date will not be entertained by BHEL.**

c) Price Bid opening will be done through e-mode / Reverse Auction method ( English method) which will be decided after techno-commercial bid evaluation is completed. All tenderers would have to specifically give their acceptance for this in their bid/s.

### **Note**

- (i) Bids including all enclosures and supporting documents like catalogues, pamphlets, etc., shall be provided in ENGLISH language only.
- (ii) In exceptional circumstances, at its option, BHEL may consider extending the due date/s for the tender openings for reasons such as (but not limited to) paucity of offers etc. However, sufficient notice would be given by BHEL for such extension.
- (iii) Deviations shall be summarized and provided in a "Deviation Statement", listing the points and the deviation against each point.
- (iv) BHEL reserves the right to increase or decrease the tendered quantity and to order on more than one vendor at the lowest acceptable price to BHEL. In ordering on more than one source, the ratio of quantity split will be as specified in the tender terms.



If not explicitly specified, BHEL reserves the right to split the quantity of the enquiry as follows: 70% quantity being ordered on the original lowest bidder (L1) and balance 30% on the next higher bidder/s excluding H1, who accepts the L1 price. However, the final decision to split the order rests with BHEL only.

In the event that the other than L1 suppliers do not accept the L1 price, then the balance will be reverted to the original L1 and the original L1 shall be bound to accept the balance of the enquiry quantity kept reserved for order splitting. This decision would be given by BHEL within 60 days of the price bid opening.

Notwithstanding the quantum of split that may be indicated in the main body of the enquiry, bidders are advised to note that the splitting of the orders will be decided by BHEL after the evaluation of the techno-commercial and price bids.

(v) Offers for part quantities on item level basis are not acceptable to BHEL. While tenderers can quote for some or all the tendered items, no supplier shall quote for partial quantity of any given enquiry item. Such partial offer would not be considered in the enquiry for that item. Suppliers are to note that the evaluation unless otherwise specified will be on item level and not for the tendered items as a whole.

### **C] Evaluation of Offers**

a) The price bids including the impact price (if any) of the technically acceptable offers alone shall be opened.

b) Offers with pre-conditions (like conditional discounts) for price are liable to be not considered / rejected. For evaluation such conditions would be removed and only the base offer would be considered for evaluation and comparison.

d) In the event of any change in scope / quantity arising out of the discussions, offerers would be given a chance to submit their revised offer / Impact bids. The option for the revised offer / impact offer will be triggered by BHEL. The Supplier then will have the facility to feed-in the revised price / impact price as per the provision given by BHEL. The impact price can be positive or negative (or nil). The impact price option shall contain only the price addition / deletion for such change in the scope / quantities, over and above the original scope and price quoted. The original price quoted would remain unchanged. The total price would then be computed by the arithmetic addition of the original price and the impact price. Where BHEL gives the option of submitting the revised offer, the impact would be computed as the arithmetic difference of the revised price and the original price.

e) For evaluating the overseas offers, CFR Chennai Sea Port price quoted will be taken into account. The cost to BHEL will be arrived at by loading the applicable customs duty project wise, insurance charges, inland transportation charges to BHEL stores and LC charges etc.,

f) Deleted.

g) BHEL reserves the right to reject without assigning any reasons / load any offer with factors other than already specified for such offers having deviations to BHEL Specifications, Standard Terms & Conditions at its discretion. The decision of BHEL in this regard shall be final.

h) BHEL reserves the right to reject an offer due to unsatisfactory performance during tender finalisation / execution of a contract at any of BHEL projects / units in the past or if unsatisfactory performance report is received from the party/s referenced by the supplier at any time during tender finalisation.



i) BHEL reserves the right to operate Purchase / Price preference to Government of India Undertakings, which shall be given as per the guidelines of Government of India given from time to time and / or relax the Terms and Conditions of the tender.

j) For the purpose of comparing prices, tender prices shall be converted to Indian rupees and the conversion shall be made by using the TT Selling rate of State Bank of India (SBI) prevailing on the date of opening of Techno-Commercial / Unpriced bids. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken. This exchange rate will be followed till placement of order. Tenderers may please note that even if an impact price is taken as in (d) for purpose of price evaluation and arriving at the rank; the exchange rate will be taken as explained above.

k) Unless otherwise specified, evaluation will be on individual line item basis only and ordering will be on respective L1 vendors.

l) BHEL reserves the right to conduct negotiations on the “Price” and “Other Commercial Terms and Conditions” with the lowest ranked offerer at any time after the bid opening but before the release of the Purchase Order and If so required by BHEL, Supplier may have to share their costing sheet with BHEL.

m) Bidders are required to confirm in writing in their techno-commercial document that other than themselves (the bidder) none of its group companies, concerns or affiliates etc., are participating in the tender either directly or indirectly or through any other agency under the same proprietor / common partner(s)/ common Directors. If during the evaluation of the bids it is found that the bidder has submitted the offer in violation of this condition then all the offers received from the group companies would stand rejected. If such relationship is found at a later date where the Purchase Order has been issued, then BHEL would cancel the Purchase Order and initiate suitable action/s under the contract/s including but not limited to invoking the Risk Purchase clause of the order and other applicable legal provisions / guidelines of BHEL including guidelines on suspension of business dealings. (Please see clause L sub-clause c).

n) For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019 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/WO against this NIT.

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

**Preference to Make in India** including counter offering will be as per the Public Procurement (Preference to Make in India), Order 2017 available in the following links

<https://dipp.gov.in/public-procurements>

[http://dipp.nic.in/sites/default/files/publicProcurement\\_MakeinIndia\\_15June2017.pdf](http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf)

[http://dipp.nic.in/sites/default/files/Revised-PPP-MII-Order-2017\\_28052018.pdf](http://dipp.nic.in/sites/default/files/Revised-PPP-MII-Order-2017_28052018.pdf)

[https://dipp.gov.in/sites/default/files/PPP-MII%20Order%20dt%2029th%20May%2019\\_0.pdf](https://dipp.gov.in/sites/default/files/PPP-MII%20Order%20dt%2029th%20May%2019_0.pdf)

#### **D] Execution of the Order**

a) BHEL will have the option to pre-inspect the materials at Supplier's works by BHEL's own inspector or by third party agency appointed by BHEL or BHEL's end customer/s. The mere act of the pre-dispatch inspection (PDI) does not absolve the Supplier from giving the specifications as agreed upon in the Purchase Order. In the case of inspection being carried out by a third party inspector (TPI) as per the extant practice, the TPI would forward the Inspection Report (IR) along with Test Certificates and other related documents



to the Quality Assurance (QA) Department of BHEL. The QA department after scrutinising the report/s submitted by the TPI would issue the Material Dispatch Clearance Certificate (MDCC). Suppliers are hereby informed that materials should be dispatched only after getting the MDCC, failing which the materials may be rejected on receipt at BHEL Stores.

b) In the case of overseas suppliers Inspection call for carrying out the inspection shall be given 30 days before the scheduled contract delivery date. The Inspection date/s given by the Supplier shall be on firm basis. For local Suppliers the Notice period of Inspection shall be 10 working days.

c) Deviations, if any pointed out by the visiting Inspection team of BHEL shall be corrected and the items as per specification shall be dispatched on or before the contract delivery date after getting the MDCC.

d) The final inspection for acceptance will, however be carried out at BHEL's works at Ranipet.

**e) The contract delivery date is the date of receipt at BHEL Stores for suppliers in India, applicable in the case of FOR Destination Contracts.**

**For ex-works contracts or FOR dispatching station indigenous contracts, the date of the Lorry way bill issued by the authorised transport carriers of BHEL / Railway Receipt / Courier Way bill / Airway bill or any such dispatch documents of carriage approved by BHEL would be considered as the Contract Delivery Date. In the case of CFR contracts with overseas suppliers, the B/L date shall be taken as the Contract Delivery Date**

f) Travel & other local stay cost for the Inspectors sent by BHEL will be to BHEL account, but other Inspection Charges, if any shall be to the account of the Seller only.

g) The supplier shall arrange for packing suitably in all respects for normal transport by sea / rail / road and Materials shall be suitably protected against effect of tropical salt laden atmosphere in the event of shipment being delayed at ports / store yards and as per BHEL TDC.

h) Foreign suppliers shall dispatch on CFR agreed Sea-Port basis, according to the contract conditions. Indian suppliers shall dispatch on free delivery (door-delivery) at BHEL stores basis only. Unloading the materials at BHEL Stores would be to the account of BHEL only.

i) In the event of any short supply, it shall be the responsibility of the supplier to deliver such short supplied/ missing items on Free-of-Cost basis at BHEL stores, including customs clearances at Indian Ports in the case of foreign suppliers.

k) Terms of payment:

k.1) For Indigenous Suppliers: Unless otherwise agreed to by BHEL, the standard payment terms of BHEL shall be: For non-MSE suppliers 100% payment made directly through EFT within 90 days from the date of receipt and acceptance of materials at BHEL Stores, Ranipet or 90 days from the date of acknowledgement of receipt of materials at destination specified. If any supplier asks for payment terms other than the above specified, then suitable loading on cost will be considered. **Loading of any deviation in the payment terms w.r.t tender terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation sought by bidders.**

k.2) For MSE vendors (under Micro & Small category alone) 100% payment will be made within 45 days from the date of receipt and acceptance of materials at BHEL Stores, Ranipet or 45 days from the date of acknowledgement of receipt of materials at destination specified.



**I) NOTE:**

Where the destination specified is other than BHEL Stores Ranipet, for claiming payment, Supplier has to submit proof of receipt of the materials at the destination by furnishing a copy of the acknowledged despatch document (LR/RR/Courier receipt etc.) .

If the Bidder is bidding for the first time and wants to be considered as an MSE then, the Bidder shall submit document evidencing that they are an MSE along with a certificate from a Chartered Accountant certifying the status of their Unit / Works clearly specifying the address of the works which is to be considered as MSE and send the same to BHEL, Ranipet either before the tender opening date or upload it as a part of the tender document in the e-procurement portal. Where the document is submitted electronically a hard copy shall invariably be sent within a reasonable period (not exceeding 30 days) from the bid opening date for the purpose of BHEL's records. If the hard copy is not received within this specified time, then the supplier would be treated as a non-MSE. BHEL will not be responsible for any postal / courier / delivery delays.

For approved vendors the status as on the date of the bid opening as available with BHEL Ranipet's records shall be used for reckoning the status of the Bidder as an MSE or otherwise.

Offer/s received without these documents will be treated as non-MSE and order finalization will be done based on this premise. Documents submitted after Bid-opening will not be considered in this tender. This provision for MSE will apply subject to the condition that the participating MSE meets the tender requirements.

For approved suppliers, in case of any change in the MSE status, it shall be the responsibility of the Bidder to notify the change as a part of the Bid document. If at a later date it comes to the knowledge of BHEL, Ranipet that the change in the status has not been intimated by the Bidder and the order is obtained under the premise of an MSE then BHEL would cancel the pending order against this tender and take necessary steps for suspension of the business dealing with the Bidder as per the procurement policy of BHEL. Similarly if a supplier claims MSE status after the Part I bid opening, then the same would not be considered in the tender.

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

Other concessions for MSEs / Reserved sectors (Also for women owned MSEs and MSEs owned by SC/STs)

In addition to the concessions specified above, MSE suppliers will be eligible for such other concessions as per the MSME Act 2006 and any other benefits / concessions that may be announced by the Government of India from time to time.. However, such concessions as applicable at the time of tender opening alone will be applicable. Any concessions advised after tender opening will not be considered for the current tender.

Items that are reserved for MSE and for any other items for which reservations for Indian manufacturers are notified by the Govt. Of India, such concessions as prevailing on the date of tender opening shall apply as a part of this tender conditions.

ii) Foreign Suppliers "100% thru' irrevocable & unconfirmed LC at sight within 3 weeks from the PO date through any one of our Bankers listed elsewhere in the tender conditions for 100% value (less Agency Commission, if any ) valid up to the PO delivery period and 15 days thereafter for negotiation. All bank



charges in India to BHEL's account and all other charges outside India to Supplier's account. **BHEL would load the price of foreign suppliers in order to bring them on common platform as per Indigenous Suppliers on the account of differential payment terms to Indigenous Suppliers. Loading of payment terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation compared to indigenous suppliers i.e. 90 days.**

m) Any incidence of tax like Income tax, Goods & Services Tax (GST) and Withholding any other similar tax / duties /levies imposed by the Government of India, or the State Government, where the BHEL Unit is located, deductible at Source, during the tenure of the Order shall be deducted by BHEL and necessary certification of the deduction (Tax deduction at Source) would be given. This is subject to the supplier fulfilling the necessary documentation as specified by the Government of India. (e.g. Tax Residency Certificate, PAN Number etc.)

n) The Guarantee period shall start from the "Date of receipt and acceptance of the materials at BHEL Stores."

#### **E) Liquidated Damages Clause:**

BHEL will levy penalty as Liquidated Damages (LD), for delay in delivery. The damages shall be at the rate of ½% per week or part thereof subject to a maximum of 10% PLUS applicable Goods & Services Tax (GST). The contract delivery date for purpose of L.D is the date of receipt at BHEL Stores for suppliers in India for F.O.R. Destination Contract and the date of dispatch clearance given by BHEL for overseas suppliers. For ex-works or F.O.R dispatching station contracts, the date of the dispatch document will be reckoned as the date of delivery for computing the LD. Supplier shall deduct the applicable LD from the first payment when raising the claim for the same. The applicable LD if any would be communicated by BHEL along with the dispatch clearance. It is taken by BHEL that Foreign Suppliers have confirmed their acceptance to BHEL for opening the LC for value which is the value of the order reduced by the applicable LD. The LD would apply on the undelivered portion only. In case of reasons attributable to BHEL for the delay in delivery (for e.g. delay in arranging the pre-inspection) then the delivery time would be reset to the extent of the time delay attributable to BHEL, with waiver of the LD. Delivery being the essence of BHEL's contract requirements, unless otherwise specified the LD would apply on the undelivered portion of the contracted items. **In the event that a Supplier does not accept the LD condition above, the offer would be loaded to the extent of the shortfall with respect to upper limit specified above.**

#### **F) Miscellaneous**

##### **i) Role of Principals and Agents:**

BHEL will deal directly with indigenous manufacturers only.

BHEL strongly discourages the engagement of Agents in India by foreign principals, to deal with BHEL, in BHEL's tenders.

BHEL will not enter into any correspondence with an Indian Agent.

The Indian Agent will not be extended the privilege given to the principals, such as that of attending the tender openings, attending technical discussions, commercial discussions or price negotiations and such like.

In case, in spite of the above, a foreign principal insists on engaging an Indian Agent, It is made clear by BHEL that:



It is the sole responsibility of the foreign principal to ensure the Agent does not represent any other foreign principal in a given tender.

An undertaking to this effect shall be given by the foreign principal that his / her Agent does not represent any other foreign principal in the tender. This document shall form a part of the techno-commercial offer.

A Principal shall authorise only one Agent to quote against each BHEL's tender. In the event a Principal authorises more than one agent to quote against a BHEL's tender, then all such offers will be rejected by BHEL in that tender. Principals are also advised to include BHEL's tender Number / Reference in their authorisation issued to the Agent.

If at any stage of the tender, BHEL finds that an Indian Agent has represented more than one foreign principal, all such offers of and all the foreign principals would be disqualified summarily in the tender inquiry.

BHEL will only give an intimation of notice of the disqualification. No correspondence would be entertained by BHEL, on their decision. Such decision of BHEL shall be irrevocable, firm and final and shall be binding on the tenderer.

BHEL, due to business reasons would ban, would have banned Indian agents from dealing with BHEL.

Any foreign principal who engages such a banned agent, or an employee of the banned agency, or any other person connected with the banned agency, at any time during the tender proceedings, would be disqualified from the tender proceedings. The decision of BHEL in this regard shall be final and be binding on the OEM.

Hence in their own interests, prospective tenderers may check with BHEL, the status of their proposed agent vis-à-vis BHEL.

In view of the requirement of BHEL, it is strongly suggested that in their own interest, foreign principals may desist from engaging any Indian agent and deal with BHEL directly and it is stressed that any Main producer proposing to deal with BHEL by engaging and through an Indian Agent does so at their own risk.

BHEL shall in no way be responsible for any consequences that may arise to the foreign principal on account of the antecedents / actions of their Indian Agent.

#### **In the event of the foreign principal engaging an Indian Agent:**

**a) The Supplier shall furnish an authenticated copy of the Agency Agreement with his agent detailing the precise relationship between them and their mutual interest in the business along with techno-commercial bid.**

b) The Supplier shall furnish original authorization letter for the Indian Agent. The letter shall contain name, contact person, complete postal address including phone, fax and e-mail ID. It shall also spell out the type of services to be rendered by Indian Agent.

c) Indian Agent & Agency commission: An Indian Agent can represent only one Foreign Manufacturer against a particular Tender. The CFR price quoted by the foreign bidder shall include the agency commission. However, the agency commission component payable to their Indian Agents shall be shown separately in the Offer, either as a lump-sum or as a percentage of the quoted price. This will be paid by BHEL in Indian Rupees, on satisfactory receipt & acceptance of the materials. For calculation of Rupee equivalent of Agency Commission, exchange rate as prevailing on the date of Purchase Order will be taken and



d) For all discussions, technical clarification and negotiations etc. only the principal would be authorized for interaction with BHEL. The Agent shall not be a party to the discussions / negotiations and would not be normally allowed to participate.

**ii) Terms & Conditions of Letter of Credit (L/C) for overseas suppliers (indicated for acceptance).**

a) Unconfirmed irrevocable Letter of Credit at Sight only will be opened by BHEL. Confirmation of L/C is not preferred by BHEL. Also L.C will be opened in Lots in line with the staggered delivery.

b) All Bank charges out side India are to the Supplier's account and within India to BHEL's account.

c) In case of L/C extension caused by delays attributable to the Supplier, the L/C extension / commitment charges are to be borne by the Supplier.

**iii) Other terms & conditions for letter of credit: - Documents for negotiation**

a) Signed Commercial invoice in quadruplicate, for a value not exceeding the draft amount, quoting the import Licence No and certifying goods evidencing shipment of the merchandise are as per Applicant's Purchase Order. The amount of invoice after deducting Indian Agent's commission, if any, should not exceed the Credit amount. (The Indian agent's commission, if any, is payable in India in Indian rupees only.)

b) Certificate of Country of Origin, from the country of manufacture, issued by the Chamber of Commerce.

c) One set of Original and two sets of Non-negotiable copies of 'signed', 'unmarked', 'clean on board' Ocean Bill of Lading, showing Shipper as "Government of India" Account M/s. Bharat Heavy Electrical Ltd, Unit: BHEL, Ranipet as consignee (The opening bank should not be notified as consignee), marked freight payable / prepaid at destination.

d) Packing list in 4 copies in English, indicating Size wise Number of bundles / pieces shipped and weight.

e) Certified copy of the fax / e-mail sent by the beneficiary to the applicant giving the following particulars of shipment, as the insurance is to be arranged by the Applicant in India: (a) Purchase Order Number & date; (b) Bill of Lading Number & date (c) Name of vessel; (d) Port of Loading; (e) Number of bundles / pieces and weight; (f) Invoice Number, date and value (g) Purchase Order item number's despatched. The cable / fax is to be sent within 2 working days of shipment.

f) Beneficiary's certificate showing the relevant airmail / courier reference no. and date that the following clauses have been complied with:

1] Beneficiary to forward by Registered Airmail / Courier one complete set of original documents and one set of non-negotiable documents within 3 working days of obtaining shipping documents to Regional Manager (ROD), Bharat Heavy Electricals Ltd, 6th Floor, EVR Periyar Bldg. No 690 (Old 474), Anna Salai, Nandanam, Chennai-600035. India. (Phone: +91-24330931, 24330253; e-mail: pbpwar@bhel.in)

2] Beneficiary to courier at his cost 3 copies of complete set of non-negotiable documents to the Officer who released the Purchase Order.

3] Declaration by the Supplier certifying that the contents in each case are not less than those entered in the invoices / packing list and that the invoicing for the supplies effected is strictly in accordance with agreed rates as stipulated in the Purchase Order.

4] Declaration to the effect that all other documents as per purchase order has been couriered to the Purchase order releasing authority

5) The carrying steamer should be seaworthy, less than 25 years of age and approved by Lloyds / Classification Societies / General Insurance Corporation of India from time to time and



6) Copy of Dispatch Clearance / Instruction issued by BHEL.

**iv) Documents to be sent directly to the Purchaser prior to shipment**

- a) Manufacturer's Original Internal Inspection / Test certificate in triplicate.
- b) Manufacturer's Original Guarantee certificate as per Purchase Order. The material shall be guaranteed for a period of 12 months from the date of acceptance of the materials at BHEL stores or 18 months from the date of dispatch whichever is earlier. The acceptance would be evidenced by the Stores Receipt Voucher (SRV) which will be raised by BHEL.
- c) Inspection / Test Certificate issued by BHEL / Inspection agency specified in the Purchase Order. In the event that Inspection prior to dispatch is not carried out by the Engineers of BHEL, the Inspection certificate of the third party so authorized by BHEL and
- d) Any other documentation as specified in the Purchase Order.

**v) Conditions for transportation:**

- a) All shipping documents shall show the Purchase Order Number & Date, Import Licence Number & Date, and Letter of Credit Number & Date.
- b) Transshipment is to be avoided.
- c) Loading on deck is not permitted. The transport document must not contain a provision that goods may be carried on deck.
- d) A transport document which is produced or appearing to have been produced by reprographic, automated or computerized systems or as carbon copy will be accepted as an original document provided that it is marked as original and is ink-signed.
- e) The transport document must contain all the conditions of carriage on the original document.
- f) The transport document must not indicate the place of destination as being different from the port of discharge.
- g) The transport document must not contain the indication 'intended' or similar qualification in relation to the vessel or other means of transport or port of loading or port of discharge.
- h) The transport document must be issued by the carrier or his agent and not by any freight forwarder.
- i) Transport documents bearing reference by stamp or otherwise, to costs additional to the freight charges are not acceptable.
- j) The Bills of Exchange must be dated and presentation of documents for negotiation must not be later than 15 days after the date of shipment and in any case not later than the expiry date of the Credit.
- l) Indian suppliers shall dispatch the materials on freight prepaid and on door-delivery basis (FOR Destination – Destination: BHEL Stores) and
- m) In the event there is a delay by the Supplier in negotiating / submitting the document, any demurrage / wharfage arising out of the same shall be to the account of the Supplier and shall be deducted from the final payment. Also, in such cases, the Supplier shall authorize the Steamer / Shipping agent / transporter to freely release the consignment to BHEL by providing a “Surrender Bill of Lading”. Over-seas Suppliers have to give a No-Objection Certificate to BHEL, authorizing BHEL to get the Delivery Order from the Steamer

Agent without producing the Original Bill of Lading. This is required to ensure avoidance of incidence of demurrage at Chennai Sea-port that may arise in case of delayed presentation of documents by the Seller.

**G) Reverse auction (RA) / on-line bidding on internet:**

1. *“BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on [www.bhel.com](http://www.bhel.com)) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders shall give their acceptance with their offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of the bids, in case BHEL decides to go for RA.”*

2. *Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit ‘Process compliance form’ (to the designated service provider) as well as ‘Online sealed bid’ in the Reverse Auction. Non-submission of ‘Process compliance form’ or ‘Online sealed bid’ by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for “Suspension of Business Dealings with Suppliers/ Contractors (as available on [www.bhel.com](http://www.bhel.com)).”*

3. The philosophy followed for reverse auction shall be English Reverse (No ties).

4. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

5. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

6. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.

7. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

8. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

9. Reverse auction will be conducted on scheduled date & time.

**Note: Decision to go for RA or not will be on case to case basis.**

10. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

11. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, to the Service provider within two working days of Auction without fail.

12. Bidders are be required to read the “Terms and Conditions” section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the „Business Rules of Reverse Auction“, which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with their offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, would also be opened after the RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. It is considered that the bidder having submitted their offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rate/s.
16. If it is found that L1 bidder has quoted higher in the online sealed bid in comparison to the envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on [www.bhel.com](http://www.bhel.com))."
17. The calculation sheet e.g. excel sheet (which will help to arrive at 'Total Cost to BHEL') will be communicated to respective bidders of RA by BHEL. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Goods & Services Tax (GST) and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.]
18. This calculation sheet will be finalized based on the evaluation criteria specified in the NIT.
19. Suppliers are required to submit their best price bid in a separate sealed cover along with techno-commercial bid. After evaluation of Techno-Commercial Bids:
- a) In case BHEL decides not to conduct RA, the envelope sealed price bids of all techno-commercially qualified bidders, along with price impact, if any, would be opened and processed as per extant the internal Purchase/ Works Policy as applicable to BHEL.
  - b) In case BHEL decides to conduct RA, business rules of RA will be sent to service provider.(See Annexure for Model General Business Rules of RA.)
20. Generally the start price for the RA would be the lowest of
- a) Lowest online sealed bid and
  - b) Internal Estimate of BHEL
- Note: Wherever more than one lowest online sealed bids are identical and lower than the estimate, the start price, would be that price arrived by reducing the lowest online sealed bid by maximum of one decrement.*
21. Reverse auction process would deemed to have started upon receipt of 'Online Sealed Bids' from the bidders within the prescribed time frame as per Business Rules.
22. After receipt of 'online sealed bids', the start price & bid decrement will be decided by BHEL and the same would be communicated to the service provider, to start the bidding process.
23. Only those bidders who have submitted the 'online sealed bid' within the scheduled time would be eligible to participate further in RA process. However, the H1 bidder (whose quote is highest in online sealed bid) will not be allowed to participate in further RA process provided minimum three bidders are left after removal of H1 bidder. In case of tie for H1 bid (identical online sealed bids), 15 minutes additional time

would be provided and all the participating bidders would be informed by mail/ message on bidding screen to enable bidders submit revised online sealed bids so as to break the tie.

24. If the lowest online sealed bid is the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system. System would have the provision to indicate this bid as current L1 for further bidding.

25. If the start price is lower than the lowest online sealed bid, on acceptance of such start price by any bidder, this bid would be indicated as current L1 for further bidding.

26. In case of no further bidding, RA will be deemed to have been successful with current L1 bidder.

27. All bidders who had given online sealed bid would be able to see their rank and L1 price and their ranking L1, L2 etc. would be based on their last quoted price irrespective of quote received in RA or online sealed bid.

28. RA shall be treated as failed in the following scenarios:

a) In cases where the start price is (a) estimate or (b) one decrement (maximum) lower than the lowest of the online sealed bids and no bidder accepts the start price.

b) In cases where the number of online sealed bids are less than four before removal of highest bidder.

c) In cases of tie among H1 bidders, even after extension of submission of online sealed bids once by 15 minutes.

d) Wherever, the evaluation is done for individual line items, RA shall be treated as failed only for those line item(s) for which any of the above a), b) or c) satisfies.

29. In cases of failure of RA, sealed envelope price bids (of item(s) for which RA has failed) of all the techno-commercially qualified bidders would be opened and the tender would be processed accordingly. However, the envelope sealed bid(s) of techno-commercially acceptable bidder(s) who had agreed to participate in the RA and had failed to submit the online sealed bid would not be opened.

30. After declaring L1 upon completion of RA, the envelope sealed price bid of L1 bidder would also be opened for placement of order on lower of the two bids (RA closing price & envelope sealed price) and the offers would be processed as per extant their internal Purchase/ Works policy provisions of BHEL. Action as per NIT terms would be taken if online sealed bid is higher than the envelope sealed bid.

31. Relative position of bidders (for usage in cases of predefined splitting the quantities) would also include bidders who have given 'online sealed bids' but have not given further bids in auction. In case of splitting requirement, H1 bidder may be considered for counter offer if the pre-stated (NIT) numbers of suppliers do not accept the counter offer. However, principle of splitting to N-1 bidder would be maintained.

32. In case H1 bidder happen to be MSE and was removed from further bidding but is within L1 + 15% band, then this bid would be considered and to be processed in line with 'Public Procurement Policy for Micro & Small Enterprises (MSEs) order, 2012'.

33. For providing preference to domestically manufactured Electronic Products, in accordance with Department of Electronics and Information Technology (DeitY) Gazette Notification No. 33(3)/2013-IPHW dated 23.12.2013 and its related notifications issued from time to time, H1 bidder removed from further bidding would be considered for counter-offer to meet domestic bidder requirement for the item(s) under procurement.

34. In case BHEL decides not to go for Reverse Auction for the tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL would be opened as per BHEL's standard practice.

35. In case of enquiry through e-Procurement, the sealed electronic price bid (e-bid) would be treated as sealed envelope price bid.

**Note: In order to bring more transparency and to address any queries of Bidders on Reverse Auction, an abridged version of BHEL's "Common Guidelines for conducting Reverse Auction (RA)" has been hosted in BHEL's web site [www.bhel.com](http://www.bhel.com) under the links "Supplier Registration Page" and "Tender Notification". All Bidders are requested to visit the link and familiarize themselves with BHEL's RA procedures and guidelines before submission of their bid/s. Submission of Bid shall mean that the Bidder has read and understood BHEL's RA procedures and the bid is in agreement with the same.**

#### **H] Force Majeure**

If at any time during the currency of this contract, the performance in whole or in part, by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (hereinafter referred to as events), then provided notice of happening of any such events is given by either party to other within ten days from the date of occurrence thereof, neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by reason or any such event claims for extension of time shall be granted for period considered reasonable by the purchaser subject to prompt notification by the seller to the purchaser of the particulars of the events and supply to the purchaser if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

#### **I] Cancellation of Order:**

In the event of non-performance of the contract by the Supplier, BHEL reserves the right to cancel the order with issue of a written notice. BHEL would provide a curing period of 30 days, for the Supplier to rectify the situation. If the Supplier fails to rectify the reason/s that led to the issue of cancellation notice by BHEL, then the cancellation order would be issued automatically by BHEL, without further recourse to the Seller. BHEL will not pay any cancellation charges or any other charges / damages to the Supplier, arising out such cancellation. In the event of the non-performance of the supply contract, by the Supplier, the rights of BHEL include, in addition to cancelling the order, to take alternate purchase action at the cost and risk of the supplier. The additional expenditure to be incurred by BHEL in such alternate purchase would be to the account of the supplier. (Risk Purchase). This remedy would be in addition to the invoking of the CEBG on grounds of failure of the Supplier in executing the Contract and any other legal remedies." BHEL reserves the right to initiate the alternate purchase action at the cost and risk of the erring supplier by issue of a simple notice of intention for the alternate purchase action duly sent by any electronic means and / or by a letter. The cancellation of the order would not be a pre-condition for initiation of the alternate purchase action.

#### **J] Contract Execution Bank Guarantee:**

To demonstrate the fidelity of the successful bidder, in executing the Contract, on receipt of the Letter of Intent / Purchase Order, the Supplier shall arrange to provide a contract execution bank guarantee (CEBG). The format of the CEBG is a part of this enquiry. The format may be downloaded and necessary stamping may be obtained from the Banker towards submission of the CEBG. The indigenous suppliers have to provide the CEBG from any one of the Nationalized Banks, listed in the annexure to these terms. Overseas suppliers can submit the CEBG from any of the reputed International / National Bankers. However the CEBG is to be confirmed by any of the Bankers listed by us. In the event of failure by the Supplier to execute the contract either fully or partially, BHEL would encash the entire CEBG. The CEBG shall be valid for the period covering the agreed delivery date of the order with a further claim period of 3 months on the last specified delivery date. In the event of the failure of delivery BHEL would proceed with encashing the CEBG without reference to the Supplier. In the event of BHEL granting extension of the delivery dates, then the CEBG validity shall also be got extended by the Supplier to the extent of the extended delivery times together with the claim period as specified elsewhere. **The CEBG shall be for a value of 2% of the Purchase order.**

**Suppliers who are all already registered with BHEL and having a vendor performance rating of A or A+ grade would be exempted from submission of CEBG.**

#### **Performance Bank Guarantee**

Where ever so required, the Supplier shall arrange to provide a Performance bank guarantee (PBG). The indigenous suppliers have to provide the PBG from any one of the Nationalized Banks, listed in the tender terms. Overseas suppliers can submit the PBG from any of the reputed International / National Bankers. However the PBG shall be confirmed by any of the Bankers listed by us. The PBG shall guarantee the performance of the equipment / materials / items supplied and shall cover the guarantee period. The PBG shall have a claim period of 3 months in addition to the guarantee period. In the event of failure of the supplies made within the guarantee period, BHEL would encash the entire PBG. **The PBG shall be for a value of 10% of the Purchase order.**

**The supplier/s have to get the PBG format (pre-printed) from BHEL and get the same stamped by the Banker. Change of PBG terms either by the supplier's Banker or by the supplier, after servicing of the order is not acceptable. Similarly PBG prepared by the supplier (typed by them) will also not be acceptable to BHEL. The pre-printed form issued by BHEL shall be used for making the PBG.**

#### **K] Post-order submission of documents for approval**

In the event of the release of Letter of Intent (LoI) / Purchase order/s (PO) against this tender, Bidders have to submit the applicable documents as called for in the tender / LoI / PO/s, such as drawings, data sheets, design calculations etc. These documents for approval have to be submitted within the agreed timelines between BHEL and Bidder. Normally the time period for submission for approval is 15 days from the date of receipt of the LoI / PO by the supplier. The actual time period within which the documents have to be submitted for approval would be specified in the LoI / PO.

Such documents would be subjected to evaluation and approval by BHEL and / or by BHEL's customer / Consultant / Customer's Consultant. Bidders have to give their specific acceptance for this.

After approval of such documents and after getting clearance from BHEL, only the items ordered can be taken up for manufacture.

Any changes required by BHEL / Customer etc. in the documents submitted for approval shall be incorporated by the Bidder and no extra cost would be payable by BHEL for such changes.



In the event that the Bidder does not carry out the required corrections, then the LoI / PO would be liable for cancellation by BHEL and BHEL would resort to alternate purchase action at the risk and cost of the Bidder under the Risk Purchase Condition of the Purchase Order.

*Note: After receiving the LoI / PO, supplier shall also forward the acknowledgement / acceptance of the LoI / PO by signing and returning the second copy of the LoI / PO as the token of acceptance.*

#### **L] Others**

a) In case of any contradiction in the terms and conditions given here and elsewhere in the other documents of the tender, it shall be the responsibility of the tenderer to get it clarified from BHEL. The officer authorized to provide such clarifications is the tender issuing officer.

b) Alterations to the conditions of the Tender can be done only by the authorized officer, at any time before the date and time of tender opening and would be duly communicated through a corrigendum.

#### **c) Suspension of Business dealings with Suppliers:**

(i) Before submitting offer, prospective bidders are advised to visit our web-site [www.bhel.com](http://www.bhel.com) / supplier registration to familiarize themselves with BHEL's policy and procedures of Suspension of Business Dealings with Suppliers.

Submission of offer shall be deemed to be evidence of the Bidder to have read and understood the above said policy.

#### **ii) Treatment of Banned / Under-performing Vendors:**

Any supplier who has been put on "Hold" or "Banned" from having business dealings with BHEL, Ranipet or any other unit of BHEL shall not submit their offer against this tender. If any such offers are received they would be summarily rejected and sent back. During the processing of tender, if any unit of BHEL puts a supplier on "Ban" then further processing of the offer will not be taken up and in case an order is placed, BHEL, Ranipet may resort at their discretion to cancel the PO either fully or partially.

If any of the supplier who is supplying similar material to BHEL, Ranipet has a Vendor Performance Rating (VPR) score of 'C' or below, then offer given by such parties will not be considered for ordering in this tender.

If any of the Bidders have unexecuted order/s with BHEL and if in such orders, the deliveries have been delayed beyond a reasonable period (say 30 days of agreed delivery period), the offer of such Bidders will also be liable for rejection.

Offers of such of those bidders against whom action for suspension of business dealings has been initiated by BHEL, Ranipet or any other Units/Division of BHEL will also not be considered in this tender.

#### **d) Fraud Prevention Policy:**

The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

#### **e) Applicability of Integrity Pact:-**

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



| Sl | IEM                                      | Address                                                                                   | Email                |
|----|------------------------------------------|-------------------------------------------------------------------------------------------|----------------------|
| 1. | Shri Arun Chandra Verma, IPS (Retd.)     | Flat No. C-1204,<br>C Tower, Amrapali,<br>Platinum Complex,<br>Sector 119, Noida<br>(U.P) | acverma1@gmail.com   |
| 2. | Shri Virendra Bahadur Singh, IPS (Retd.) | H.No.B-5/64, Vineet<br>Khand, Gomti Nagar,<br>Lucknow - 226010                            | vbsinghips@gmail.com |

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.

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

Note:

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

*For all clarifications/ issues related to the tender, please contact:*

Name: (1) ..... (2) .....

Dep't: .....

Address: .....

.....

Phone:(Landline/Mobile) (1) ..... (2) .....

Email:

Fax:

Integrity Pact are applicable for all the BHEL enquiries whose estimated value is equal to or more than Rupees 05 Crores.

Copy of Integrity Pact with applicable nominated IEM is attached along with the tender documents for ready reference of Suppliers.

f) If any Supplier attempts to bribe, or pay commission, gift or any advantage or bring in undue influence either by himself or on his behalf any one including a stranger to the tender, in addition to instituting legal proceedings as per the extant laws prevailing, will disqualify the supplier from this tender and all future tenders of BHEL. Decision of the Purchaser would be final in this matter.

g) The laws governing this transaction shall be the laws in India.

h) Wherever not specified, Inco terms 2010 shall be used to interpret the Commercial terms and conditions and

i) In the event of an order, Supplier shall agree to settlement of disputes or differences, if any, by way of arbitration, in accordance with the "Rule of Arbitration" of the Indian Council of Arbitration.



*The language in the tender documents downloaded by the Bidders shall at no point of time be changed, altered or modified in any manner by the Tenderer. If such changes are made by any tenderer, it shall be considered as tampering with BHEL's terms and the offer shall be summarily rejected, whenever it is noticed by BHEL. Such Bidders would be disqualified from the Bidding Process and their offers would be forfeited / Bank Guarantees invoked. They would also not be allowed to participate in future tenders of BHEL.*

**M. Conditions for rejection of offers:**

**Following is the list of situations which would lead to rejection of offer/s.**

**This list is not exhaustive but only indicative.**

BHEL reserve the right to reject one or all offers without assigning any reason. The decision of BHEL will be final in this regard.

- 1. If the offer fails to meet the technical requirements/specifications of the tendered item/s.*
- 2. If the offer does not meet the commercial terms & conditions, such as but not limited to delivery period specified in the tender, Delivery terms, payment terms, Liquidated damages, Risk Purchase, cancellation clause etc., including the load factors specified in the tender.*
- 3. If the bidder fails to respond to clarification sought, within a reasonable period. In case of doubts / lack of clarity on the technical and commercial offer of the bidder, BHEL will seek clarifications. Bidders are required to respond completely to such BHEL's queries within 3 working days unless otherwise agreed to in writing by BHEL for period beyond 3 days. If supplier fails to respond within 3 working days or maximum 2 working days on a reminder thereon, the offer of such bidders will be automatically dis-qualified in the tender without further recourse to informing the bidder.*
- 4. If any of the conditions listed below are applicable to the bidder, the offer is liable to be rejected:*

*If any*

- Debt recovery / Winding up Proceedings are initiated against the Company in Courts / Debt Recovery Tribunals (DRTs),*
  - Proceedings are there against the Company in National Company Law Tribunal (NCLT) with respect to Insolvency and Bankruptcy Code (IBC) or otherwise,*
  - Any proceedings are there against the Company under the "Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act,*
  - Any restructuring proceedings are underway for the Company under Corporate Debt Restructuring (CDR), Strategic Debt Restructuring (SDR) or otherwise,*
  - Divestment / demerger proceedings are underway for the Company under the Companies Act.*
  - If action under guidelines of suspension of business dealings (Ref AA/MM/SB/01 Rev 02 dt 22.07.2016) and its latest revisions has been initiated against the company/bidder.*
- 5. Failure to sign & accept the Integrity Pact (where applicable). Bidders are hereby informed that the contents of the Integrity Pact are firm and fixed and cannot be changed.*

The above list is not exhaustive but is indicative only.

**N. Special Note:**

BHEL is a Government of India Undertaking. Its procurement practices are governed by the (Internal) Purchase Policy issued by the management of the company and as per Annexure B applicable at the time of finalising the order against this tender.

**-O-**



**Record of Revisions:**

| Revision No. | Revision Date | Modification                                                                                                                                                                                                                                            |
|--------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01           | 17.08.2016    | Payment terms for Foreign suppliers modified wrt loading- Clause k.ii                                                                                                                                                                                   |
| 02           | 29.08.2016    | Treatment of banned vendors – Para 3 added - Clause L.ii                                                                                                                                                                                                |
| 03           | 14.09.2016    | Opening of offers – clause B – sub clause ‘b’ included and existing clause ‘b’ renamed as ‘c’.                                                                                                                                                          |
| 04           | 14.09.2016    | Opening of offers – Note – sub clause (ii) modified                                                                                                                                                                                                     |
| 05           | 12.10.2016    | Clause N. Special Note added                                                                                                                                                                                                                            |
| 06           | 22.10.2016    | Clause G Reverse Auction modified.<br>Annexure on General Business Rules for Reverse Auction appended<br>Role of Principals added under ‘Miscellaneous’                                                                                                 |
| 07           | 20.01.2017    | Clause L (e) is modified.<br>Clause L (f ,g ,h) renumbered.                                                                                                                                                                                             |
| 08           | 24.02.2017    | Clause F(c) modified.                                                                                                                                                                                                                                   |
| 09           | 08.07.2017    | Clause M, Point 4 is added – regarding the financial health of the Bidder - as a criterion for disqualification.                                                                                                                                        |
| 10           | 20.07.2017    | Duties and Taxes replaced with GST; Applicability of GST for LD inserted in Clause E; Treatment of poor performing current vendors inserted in clause L.c.(ii)                                                                                          |
| 11           | 25.07.2017    | Clause A.Note (iii) CST etc., replaced with GST;<br>Clause C.f Deleted;                                                                                                                                                                                 |
| 12           | 15.09.2017    | Clause M, Point 5 inserted regarding Integrity Pact                                                                                                                                                                                                     |
| 13           | 21.03.2018    | Clause A, Point xi inserted regarding Overwriting in Price Bids                                                                                                                                                                                         |
| 14           | 28.05.2018    | Clause A, a),b),c),d) amended for M/s E-Procurement technologies, <a href="https://bhel.abcpurchase.com">https://bhel.abcpurchase.com</a> . Clause A, (f, g, h) – modified.<br>Clause M, Point 4, - regarding suspension of business dealings inserted. |
| 15           | 23.07.2018    | Clause L,(e)- Applicability of Integrity Pact – modified.                                                                                                                                                                                               |
| 16           | 31.08.2018    | Clause C,(n)- Preference to Make in India – added.                                                                                                                                                                                                      |
| 17           | 04.12.2018    | Clause C,(n)- Preference to Make in India & Clause K.2 Note - MSE concessions– modified.                                                                                                                                                                |
| 18           | 13.02.2019    | Clause C,(n)- Preference to Make in India – modified.<br>Page no 9 Clause o – Extended credit period - removed.                                                                                                                                         |
| 19           | 24.09.2019    | Clause C,(n) - Preference to Make in India – modified.<br>Clause L,(e) - New IEMs Updated                                                                                                                                                               |

## ANNEXURE

### Model General Business Rules for Reverse Auction

This has reference to tender no {tender number....date...}. BHEL shall finalise the Rates for the supply of {item name} through Reverse Auction mode. BHEL has made arrangement with M/s. {Service provider}, who shall be BHEL's authorized service provider for the same. Bidders should go through the instructions given below and submit acceptance of the same. The technical & commercial terms are as per (a) BHEL Tender Enq. No. {...} dated {...}, (b) Bidders' technical & commercial bid (in case of two part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

#### 1. Procedure of Reverse Auctioning

- i. Online Sealed Bid: This duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.
- ii. Online Reverse Auction: The 'opening price' i.e. start price for RA and 'bid decrement' will be decided by BHEL.
- iii. If BHEL decides the lowest online sealed bid as the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system and no acceptance of that price is required. System shall have the provision to indicate this bid as current L1.
- iv. Bidders by offering a minimum bid decrement or the multiples thereof can displace a standing lowest bid and become "L1" and this continues as an iterative process.
- v. After the completion of the online reverse auction, the Closing Price (CP) shall be available for further processing.

**2. Schedule for Reverse Auction:** The Reverse Auction is tentatively scheduled on {date}: and the duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.

#### - Online Sealed Bid:-

- {Start Time:
- Close Time: }

#### - Online Reverse Auction:-

- {Start Time:
- Close Time: }

#### 3. Auction extension time:

If a bidder places a bid in the last {...} minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another {...} minutes, for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last {...} minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last {...} minutes. In case, there is no bid in the last {...} minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {Service provider} with a copy to BHEL within 15 minutes prior to initial closing time of Online Reverse Auction.

**4. Bid price:** The Bidder has to quote the {...} Price inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, GST, Freight (bidder to provide original Freight paid

receipt), insurance charges, etc. including loading (if indicated by BHEL due to deviations in technical/commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of total cost to BHEL (To be specified by Unit as per NIT conditions).

**5. Bidding currency and unit of measurement:**

Bidding will be conducted in *Indian Rupees per Unit* of the material as per the specifications {...}

In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid) shall be considered for conversion in Indian Rupees. If the relevant day happens to be a Bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.

**6. Validity of bids:** Price shall be valid for {... days} from the date of reverse auction. These shall not be subjected to any change whatsoever.

**7. Lowest bid of a bidder:** In case the bidder submits more than one bid, the lowest bid at the end of Online Reverse Auction will be considered as the bidder's final offer to execute the work.

**8.** Bidders shall be assigned a **Unique User Name & Password** by M/s. {Service provider}. Bidders are advised to change the Password and edit the information in the Registration Page after the receipt of initial Password from M/s. {Service provider} to ensure confidentiality. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.

**9.** Post auction procedure: BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.

**10.** Any commercial/ technical loading shall be intimated to bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during online sealed bid & Online Reverse Auction. Modalities of loading & de-loading shall be separately intimated to the bidders. The responsibility for correctness of total cost to BHEL shall lie with the bidders.

**11.** Computerized reverse auction shall be conducted by BHEL (through M/s. {Service Provider}), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

During the RA process if a bidder is not able to bid and requests for extension of time by FAX/ email/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained. Despite this extension if bidder fails to upload his prices due to extreme case of failure of Internet connectivity, (due to any reason whatsoever may be) it is the bidders'

responsibility/ decision to send fax communication immediately to M/s. {Service provider}, furnishing the price the bidder wants to bid online with a request to the service provider to upload the faxed price online so that the service provider will upload that price online on behalf of the Bidder. It shall be noted clearly that the concerned bidder communicating this price to service provider has to solely ensure that the fax message is received by the service provider in a readable/ legible form and also the Bidder should simultaneously check up with service provider about the clear receipt of the price faxed. It shall also be clearly understood that the bidder shall be at liberty to send such fax communications of prices to be uploaded by the service provider only within the closure of Bid time and under no circumstance it shall be allowed beyond the closure of Bid time /reverse auction. It shall also be noted that the service provider should be given a reasonable required time by the bidders, to upload such prices online and if such required time is not available at the disposal of the Service provider at the time of receipt of the fax message from the bidders, the service provider will not be uploading the prices and either BHEL or the service provider are not responsible for this unforeseen circumstances. In order to ward-off such contingent situation bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {Service provider} is responsible for such eventualities.

**12. Proxy bids:** Proxy bidding feature is a pro-bidder feature to safeguard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid. Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant. In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price. Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

**13.** Bidders are advised to get fully trained and clear all their doubts such as refreshing of screen, quantity being auctioned, tender value being auctioned etc. from M/s. {Service provider}.

**14.** M/s. {Service provider}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {Service provider}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.

**15.** Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure-VI) for price breakup including that of line items, if required, quoted during the Online Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {Service provider} besides BHEL within two working days of Auction without fail.

**16.** Any variation between the final bid value and that in the confirmatory signed price breakup Document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on [www.bhel.com](http://www.bhel.com)).

**17.** Bidders' bid will be taken as an offer to execute the work/ supplies of the item as per enquiry No. {...} dt. {...}. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on [www.bhel.com](http://www.bhel.com)).

**18.** Bidders shall be able to view the following on their screen along with the necessary fields during Online Reverse Auction:

- a. Leading (Running Lowest) Bid in the Auction (only total price of package).
- b. Bid Placed by the bidder.
- c. Start Price.
- d. Decrement value.
- e. Rank of their own bid during bidding as well as at the close of auction

**19.** BHEL's decision on award of contract shall be final and binding on all the Bidders.

**20.** BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with intimation to bidders.

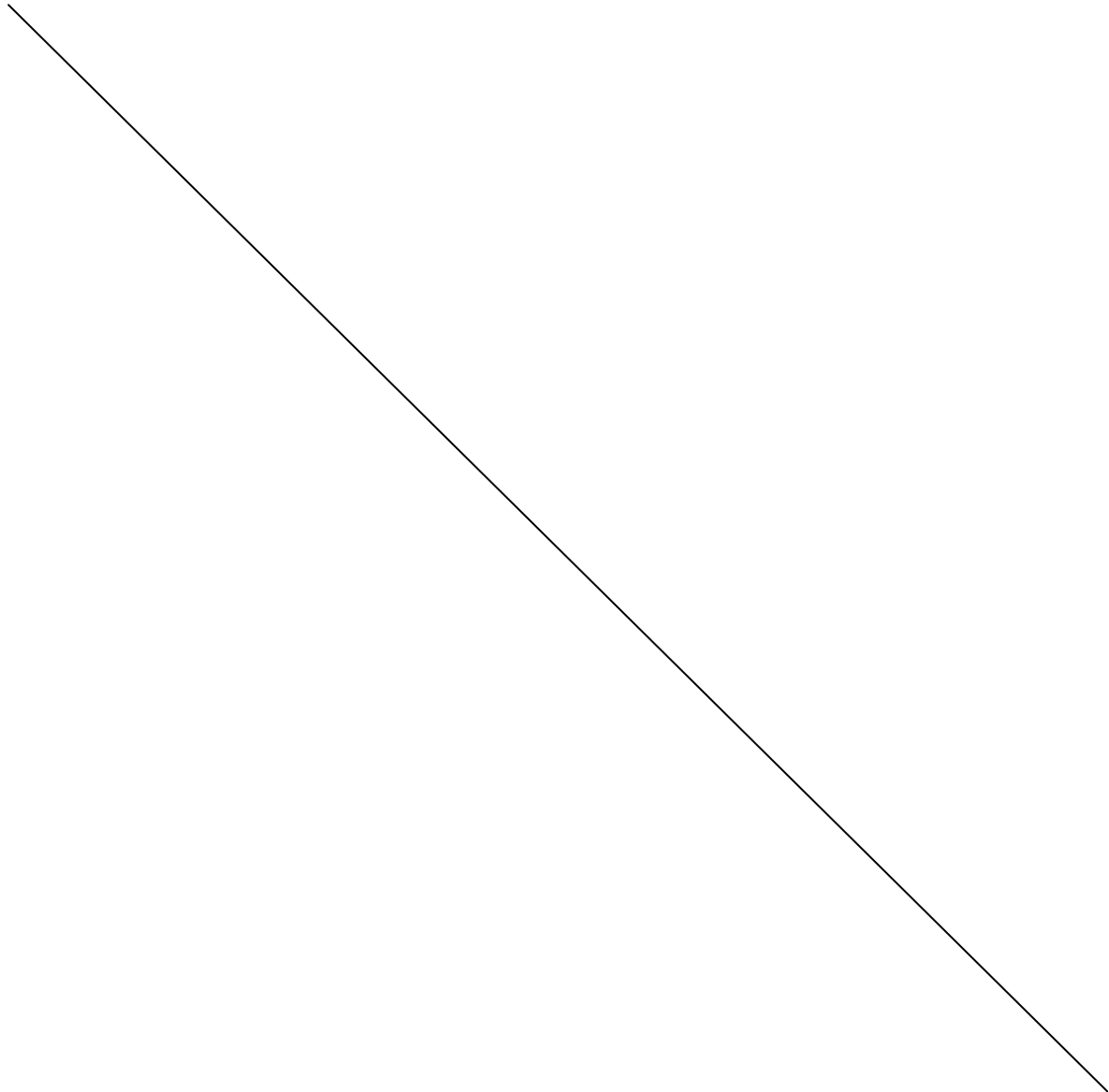


21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.

22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.

23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {Service provider}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time..

24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines for suspension of business dealings (as available on [www.bhel.com](http://www.bhel.com)), shall be initiated by BHEL.





**RA price confirmation and breakup**  
(To be submitted by L1 bidder after completion of RA)

To  
- M/s. Service provider  
- Postal address

CC: M/s BHEL

BOILER AUXILIARIES PLANT  
INDIRA GANDHI INDUSTRIAL COMPLEX  
RANIPET – 632406  
TAMILNADU  
INDIA.

Sub: Final price quoted during Reverse Auction and price breakup

Dear Sir,

We confirm that we have quoted.

**Rs.{ \_\_\_\_\_ in value & in words \_\_\_\_\_ } for item(s) covered under tender enquiry**  
**No. {...} dt.{...}**

Total price of the items covered under above cited enquiries is inclusive of {Packing & forwarding, GST, freight and insurance charges up to {.....}  
District, {.....} State and Type Test Charges etc., [exclusive of Goods & Services tax (GST)],  
other as  
per NIT}

as our final landed prices as quoted during the Reverse Auction conducted today {date} which will  
be valid for a period of { \_\_\_\_ in nos. & in words \_\_\_\_ } days.

The price break-up including that of line items is as given below.

|       |                          |
|-------|--------------------------|
| Total | =====                    |
|       | - Rs.in value & in words |
|       | =====                    |

Thanking you and looking forward to the valuable order from BHEL.

Yours sincerely,  
For \_\_\_\_\_  
Name:  
Company:  
Date:  
Seal:

**ANNEXURE - C**  
**BHEL : BAP : RANIPET**  
**PURCHASE – WATER SYSTEM**  
**COMMERCIAL TERMS AND CONDITIONS-INDIGENOUS SUPPLY**  
**SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES**  
**AND MANDATORY SPARES**  
**FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT**  
**(INTERNATIONAL ORDER)**  
**Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT\_ 53022)**

| Sl. No. | DESCRIPTION                                                              | BHEL (PURCHASER) REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | VENDOR (SELLER) CONFIRMATION |
|---------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| I       | <b>Technical</b>                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |
| 01      | SCOPE OF SUPPLY                                                          | <p>Please confirm the Scope of Supply of "CARBON DI OXIDE DOSING SYSTEM &amp; ACCESSORIES " as per Specification No.</p> <p>1) ROS 6295 REV 00 DATE 14.05.2020 - TECHNICAL SPECIFICATION FOR CARBON DI OXIDE DOSING SYSTEM,</p> <p>2) ROS 4366 REV 00 DATE 20.05.2019 - TECHNICAL SPECIFICATION FOR ELECTRICAL, CONTROL &amp; INSTRUMENTATION</p> <p>3) ANNEXURE B - PAINTING,</p> <p>4) ANNEXURE H – P &amp; ID CARBON DI OXIDE DOSING SYSTEM,</p> <p>submit the same after necessary Filling,signing &amp; returning a copy of the same.</p>                                                                                                                                                                                                  |                              |
| 02      | SPECIFICATION                                                            | Please confirm Clause wise / Point wise "IN TOTO" for all specifications and submit along with offer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |
| 03      | DATA SHEETS / DRAWINGS                                                   | Filled Data Sheets and Drawings are to be submitted along with offer. (if applicable )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |
| 04      | QUALITY ASSURANCE PLAN (QAP / QP / MQP)                                  | <p>Please Confirm to submit the QAP / QP / MQP as per the Customer Sample Format for review and approval by customer (M/s. BIFPCPL-MAITREE STPP 2 X 660 MW PROJECT) and or M/s. FITCHNER (Customer's Consultant) within 2 Weeks from the date of Letter of Award (LOA).</p> <p><b>Please Refer Annexure - Q and provide your acceptance.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                |                              |
| 05      | SPECIFICATION DEVIATION DISPOSITION REPORT (SDDR)                        | Attached SDDR to be filled & submit along with offer. (Even, If NO deviation is taken, NIL report to be submitted).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |
| 07      | MANDATORY SPARES                                                         | <p>Please confirm that the " Supply of "MANDATORY SPARES" as per the Technical specification</p> <p>1) ROS 6295 REV 00 DATE 14.05.2020 - TECHNICAL SPECIFICATION FOR CARBON DI OXIDE DOSING SYSTEM,</p> <p>2) ROS 4366 REV 00 DATE 20.05.2019 - TECHNICAL SPECIFICATION FOR ELECTRICAL, CONTROL &amp; INSTRUMENTATION &amp;</p> <p>3) 6) ANNEXURE M – MANDATORY SPARES FOR CARBON DI OXIDE DOSING SYSTEM,</p> <p>Mandatory Spares shall be packed separately with detailed packing list (items should not be packed along with main supply items)</p> <p>Mandatory Spares List and the individual price should be indicated.</p> <p>The Bidder should also indicate if any spare(s) other than those indicated in the spec is/are required.</p> |                              |
| 08      | PRE-QUALIFICATION REQUIREMENT - CO2 SYS : MAITREE REV 00 DATE 18.05.2020 | Vendor should submit the Filled QR Annexure & Necessary supporting documents proof for meeting the QR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |
| 09      | CUSTOMER APPROVAL                                                        | Vendor should submit their Credentials for our Customer Approval.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |
| II      | <b>Commercial Terms &amp; Conditions</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |
| 1       | PRICE                                                                    | Please confirm 'Firm Price' till completion of order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |

**ANNEXURE - C**  
**BHEL : BAP : RANIPET**  
**PURCHASE – WATER SYSTEM**  
**COMMERCIAL TERMS AND CONDITIONS-INDIGENOUS SUPPLY**  
**SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES**  
**AND MANDATORY SPARES**  
**FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT**  
**(INTERNATIONAL ORDER)**  
**Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT\_ 53022)**

| Sl. No. | DESCRIPTION                               | BHEL (PURCHASER) REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | VENDOR (SELLER) CONFIRMATION |
|---------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 2       | UNPRICED BID (PART-1)                     | Please confirm submission of 'Unpriced bid' in the price bid format attached duly signed.<br>SCANNED COPY of FILLED & SIGNED COPY OF 'Price Bid' format attached by filling all informations by writing 'Quoted' as the case may be in the 'Rate' and 'Value' columns to be submitted through E-Procurement System.                                                                                                                                                                                                            |                              |
| 3       | PRICED BID (PART-2)                       | Please confirm submission of 'Priced bid' in the price bid format attached duly signed.<br>SCANNED COPY of FILLED & SIGNED COPY OF 'Price Bid' format attached by filling all informations by writing the value as the case may be in the 'Rate' and 'Value' columns in a separate attachment to be submitted through E- Procurement System.<br><br><b>Price bid opening will be considered after the Techno-Commercial evaluation &amp; further final approval from the customer: BIFPCPL-MAITREE STPP 2 X 660 MW PROJECT</b> |                              |
| 4       | DELIVERY TERMS & PRICE BASIS              | Please confirm for FOR - Destination (BHEL- BAP, RANIPET) basis.<br><br>Unloading the Material at site is BHEL Scope.                                                                                                                                                                                                                                                                                                                                                                                                          |                              |
| 05A     | DESTINATION                               | Please confirm supply to the following consignee address in the event of Order.<br><br><b>THE SDGM / STORES</b><br><b>BHEL- BAP, RANIPET,</b><br><b>VELLORE DISTRICT- 632 406</b><br><b>TAMILNADU.</b>                                                                                                                                                                                                                                                                                                                         |                              |
| 05B     | END CUSTOMER                              | <b>M/s. BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (PVT) LIMITED,</b><br><b>(A JOINT VENTURE COMPANY OF BPDB &amp; NTPC LTD.) LEVEL - 17,</b><br><b>BORAK UNIQUE HEIGHTS,</b><br><b>117 KAZI NAZRUL ISLAM AVENUE ESKATON GARDEN, DHAKA-1217</b><br><b>BANGLADESH</b>                                                                                                                                                                                                                                                            |                              |
| 06      | ORIGIN OF DESPATCH OF VARIOUS CONSIGNMENT | Please indicate clearly the origin of despatch of various consignments duly indicating whether interstate or intrastate based on the consignee address above.<br>Origin of despatch should not be subjected to change during execution of contract.                                                                                                                                                                                                                                                                            |                              |
| 07      | PACKING & FORWARDING                      | Please confirm inclusion of Packing & Forwarding Charges in the Basic quoted price.<br><br>If it is extra payable by BHEL, Please clearly indicate the applicable Packing & Forwarding charges in % value.<br><br>Packing should be as per <b>"SEAWORTHY PACKING SPEC. PE TS 888 100 A001 REV 00" - APPLICABLE FOR ENQ. SL. NO. 001 -042 &amp; 085 - 088</b> - Please confirm                                                                                                                                                  |                              |
| 08      | FREIGHT & INSURANCE                       | Please confirm inclusion of Freight & Insurance Charges towards this in the Basic quoted price.<br><br>A) If Freight & GST is extra payable by BHEL, Please clearly indicate the applicable portions of :<br>01.Freight charges in % on Basic Quoted price.<br><br>02.If GST applicable for the freight kindly indicate the same.<br><br>B) If Insurance is extra payable by BHEL, Please clearly indicate the applicable portions of : Insurance charges in % on Basic Quoted price.                                          |                              |

**ANNEXURE - C**  
**BHEL : BAP : RANIPET**  
**PURCHASE – WATER SYSTEM**  
**COMMERCIAL TERMS AND CONDITIONS-INDIGENOUS SUPPLY**  
**SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES**  
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**FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT**  
**(INTERNATIONAL ORDER)**  
**Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT\_ 53022)**

| Sl. No. | DESCRIPTION                                   | BHEL (PURCHASER) REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | VENDOR (SELLER) CONFIRMATION |
|---------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 09      | GOODS AND SERVICES TAX (CGST/SGST/UTGST/IGST) | <p>Please indicate the exact percentage of CGST/SGST/UTGST/IGST (whichever is applicable) is quoted as per the existing tariff on the date of the offer and all benefits as per existing laws have been considered.</p> <p>It is the responsibility of the seller to issue the Tax Invoice strictly as per the format prescribed under the relevant applicable GST law (CGST Act/SGST Act/UTGST Act/IGST Act).</p> <p>Vendor to indicate the proper GSTN Registration/ HSN code in their tax invoice.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |
|         |                                               | Please Confirm the Applicable percentage of CGST/SGST/UTGST/IGST Payable Extra by BHEL (OR) Not?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |
| 10A     | PAYMENT TERM FOR SUPPLY                       | <p>1. vendor has to submit the Invoice for 100% of Basic price with applicable % of GST, Freight with GST if any. BHEL will be released the 100% Payment of basic price of materials supplied, along with freight, taxes and duties (as applicable), shall be paid against receipt of material at BHEL-BAP-STORES (SRV) and submission of Bank Guarantee for 10% of PO value valid till guarantee period towards performance before first submission of documents for payment.</p> <p>BG - 10% of Order/ Contract value (excluding taxes, duties &amp; freight) before first submission of documents for payment to cover the due performance of Order/ Contract and to fulfill the guarantee conditions stipulated in the Order/ Contract.</p> <p><b>Validity of the Bank Guarantee shall be for the entire Guarantee period. Initially, it should be at least 18 months plus 3 months claim period, later extended to cover the entire guarantee period, two months before its expiry.</b></p> |                              |
| 10B     | CONFIRM THE PAYMENT TERM FOR SUPPLY.          | <p>Differential Payments applicable for Supply - Within 45 days for MSE vendor &amp; 90 days for Non MSE vendors</p> <p>Please confirm your status in case of MSME with relevant proof.</p> <p><b>For MSE Registration, you have to submit the Notarized copy of MSE certificate with Original CA certificate</b></p> <p><b>Offers with payment Terms such as Cash against Delivery / advance payment / payment through Bank against dispatch documents will be summarily rejected</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |
| 11      | DELIVERY PERIOD FOR THE SUPPLY                | <p>Please confirm the supply completion on or before <b>31.12.2020 or 6 Months from the date of CAT-1 Approval / Manufacturing clearance</b>, which ever is Later.</p> <p>Vendor to submit all drawings/documents within 2 weeks from the date of purchase order and resubmit the drawings/documents within 1 week incorporating all the comments.</p> <p>In case there are delays of submission of drawings/documents beyond 2 weeks of order or 1 week of comments, that much days of delay would be reduced from delivery period.</p> <p>Vendor can also quote improved delivery date if any or otherwise, please clearly indicate the delivery period in weeks / months from the date of Manufacturing clearance.</p> <p>NOTE: Delivery period shall be reckoned till receipt of materials at site. For LD Purpose, Date of site receipt of material will only be considered.</p>                                                                                                            |                              |
| 12      | LIQUIDATED DAMAGES (LD) - Supply Portion      | <p>Purchaser reserves the right to recover from the Seller/ Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent of the Undelivered Portion price per week or part thereof, subject to a maximum of ten (10) percent of the total contract price including GST &amp; freight, if the Seller/ Contractor fails to deliver any part of the ordered stores within the period stipulated in the Order/ Contract.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |

**ANNEXURE - C**  
**BHEL : BAP : RANIPET**  
**PURCHASE – WATER SYSTEM**  
**COMMERCIAL TERMS AND CONDITIONS-INDIGENOUS SUPPLY**  
**SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES**  
**AND MANDATORY SPARES**  
**FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT**  
**(INTERNATIONAL ORDER)**  
**Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT\_ 53022)**

| Sl. No. | DESCRIPTION                                                                                                                                                                            | BHEL (PURCHASER) REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                              | VENDOR (SELLER) CONFIRMATION |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 13      | OFFER VALIDITY                                                                                                                                                                         | Please confirm Offer Validity for a minimum period of 60 days from the date of price bid opening.                                                                                                                                                                                                                                                                                                                                                         |                              |
| 14      | INSPECTION                                                                                                                                                                             | Please confirm for 'Inspection' of all the Items by BHEL Engineers / BHEL Authorized Engineer and Customer / Consultant Engineer either jointly or individually before the dispatch of the item at vendor works as per approved QAP. Please note that no payment will be made by BHEL towards inspection.                                                                                                                                                 |                              |
| 15      | TEST CERTIFICATE (TC)                                                                                                                                                                  | Please confirm that required TC will be provided at 'No Extra Cost'.                                                                                                                                                                                                                                                                                                                                                                                      |                              |
| 16      | GUARANTEE CERTIFICATE (GC) - Supply Portion.                                                                                                                                           | Please confirm furnishing of Guarantee certificate in BHEL format for 12 months from the date of commissioning or 18 months from the date of last despatch whichever is earlier.                                                                                                                                                                                                                                                                          |                              |
| 17      | <b>Contract Execution Bank Guarantee (CEBG).</b><br>Ple Ref: ANNEXURE –A GENERAL TERMS & CONDITIONS (FOR GUIDANCE TO THE SUPPLIERS)Under Clause -J] Contract Execution Bank Guarantee: | To demonstrate the fidelity of the successful bidder, in executing the Contract, on receipt of the Letter of Intent / Purchase Order, the Supplier shall arrange to provide a contract execution bank guarantee (CEBG).                                                                                                                                                                                                                                   |                              |
| 18      | BANK GUARANTEE (BG) TOWARDS Supply Portion (10% OF ORDER VALUE)                                                                                                                        | BG to be submitted in the format issued by BHEL.<br>BG for 10% of the Total PO Value. Validity of the Bank Guarantee shall be for the entire Guarantee period. Initially, it should be at least 18 months, later extended to cover the entire guarantee period, two months before its expiry.                                                                                                                                                             |                              |
| 19      | ERECTION MANUAL (INSTALLATION INSTRUCTIONS)                                                                                                                                            | Please confirm for providing of 'comprehensive Erection Manual covering the entire supply which include bought-outs' 6 sets in Hard copy & one CD form.                                                                                                                                                                                                                                                                                                   |                              |
| 20      | O & M MANUAL                                                                                                                                                                           | Please confirm for providing of 'comprehensive O&M Manual covering the entire System' 6 sets in Hard copy & one CD form.                                                                                                                                                                                                                                                                                                                                  |                              |
| 21      | REVERSE AUCTION                                                                                                                                                                        | Please see the Clause in the main enquiry regarding Reverse Auction (RA). RA will be conducted through our Service Provider. Vendor to confirm acceptance.                                                                                                                                                                                                                                                                                                |                              |
|         |                                                                                                                                                                                        | Please note that in case BHEL decides not to conduct RA, the sealed price bids along with the impact price bids arising out of techno-commercial discussions already available with BHEL only will be opened. Please note that no impact price due to non-conductance of RA will be accepted. Vendor to confirm acceptance.                                                                                                                               |                              |
| 22      | RISK PURCHASE CLAUSE (CLAUSE No. 6 of General Terms and Conditions for Indigenous offer)                                                                                               | BHEL's Standard Risk Purchase clause will be applicable. Please confirm.                                                                                                                                                                                                                                                                                                                                                                                  |                              |
| 23      | ZERO DATE (CONTRACT EFFECTIVE DATE)                                                                                                                                                    | Contract Effective date starts from Manufacturing Clearance subject to Documents submission clause.<br>Please confirm for 'Date of Manufacturing Clearance'.                                                                                                                                                                                                                                                                                              |                              |
| 24      | Loading Criteria                                                                                                                                                                       | Please note that no Commercial deviation is acceptable to BHEL. In case any deviation is taken in any of the commercial terms such as PAYMENT TERMS, LD, PBG, etc., where in we have specified the days, percentages etc., then loading will be done to the extent of the short fall with respect to the upper Limit specified for evaluation.<br>In respect of LD offers which do not accept for LD Clause would be summarily rejected - Please Confirm. |                              |
| 25      | NEGOTIATION                                                                                                                                                                            | In the event of negotiation if any, please confirm participation only by supplier's representative and not by their Agent which include indian Agent in the case of Foreign Offer.                                                                                                                                                                                                                                                                        |                              |
| 26      | OTHER DOCUMENTS FOR APPROVAL (BBU)                                                                                                                                                     | In the event of order vendor should confirm the submission of BBU for the complete system supply with break up for each line item as well as quantities with value (If Applicable)                                                                                                                                                                                                                                                                        |                              |
|         |                                                                                                                                                                                        | GST Regn. Number                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |

PLEASE PROVIDE THE STATUTORY

**ANNEXURE - C**  
**BHEL : BAP : RANIPET**  
**PURCHASE – WATER SYSTEM**  
**COMMERCIAL TERMS AND CONDITIONS-INDIGENOUS SUPPLY**  
**SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES**  
**AND MANDATORY SPARES**  
**FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT**  
**(INTERNATIONAL ORDER)**  
**Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT\_ 53022)**

| Sl. No. | DESCRIPTION                                                                                                                                                                                                 | BHEL (PURCHASER) REQUIREMENT                                                                                                    | VENDOR (SELLER) CONFIRMATION |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 27      | PLEASE PROVIDE THE STATUTORY DETAILS<br>(Submit a copy of PAN, if not submitted already)                                                                                                                    | <div>HSN NO.: HARMONIZED SYSTEM OF NOMENCLATURE UNDER GST FOR THE OFFERED ITEM</div> <div>PAN No. :</div>                       |                              |
| 28      | CONTACT PERSON'S ON TECHNICAL DETAILS FOR CORRESPONDENCE                                                                                                                                                    | <div>Name:</div> <div>Designation:</div> <div>Phone No.:</div> <div>Mobile No.:</div> <div>Fax No.:</div> <div>E-mail ID:</div> |                              |
| 29      | CONTACT PERSON'S ON COMMERCIAL DETAILS FOR CORRESPONDENCE                                                                                                                                                   | <div>Name:</div> <div>Designation:</div> <div>Phone No.:</div> <div>Mobile No.:</div> <div>Fax No.:</div> <div>E-mail ID:</div> |                              |
| 30      | <p>BHEL will not take cognizance of commercial terms mentioned by the bidder any where else.</p> <p>Commercial terms and conditions indicated in this Annexure - A will only be applicable and binding.</p> | Acceptance Required                                                                                                             |                              |

Signature, Seal & Date of offerer on all the pages.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |             |                               |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------------------------|--------------------------|
| <p style="text-align: center;"><b>ANNEXURE - D</b><br/> <b>BHEL : BAP : RANIPET</b><br/> <b>PURCHASE – WATER SYSTEM</b><br/> <b>PRICE OFFER FORMAT</b><br/> <b>UN PRICED OFFER / PRICE OFFER ( Please Tick whichever is applicable)</b><br/> <b>SUPPLY OF CARBON DI OXIDE DOSING SYSTEM &amp; ACCESSORIES</b><br/> <b>AND MANDATORY SPARES</b><br/> <b>FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT</b><br/> <b>(INTERNATIONAL ORDER)</b><br/> <b>Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT_ 53022)</b></p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |             |                               |                          |
| <b>PRICE OFFER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |             |                               |                          |
| <b>Enquiry<br/>Sl. No.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Unit</b> | <b>Qty.</b> | <b>Rate / Unit<br/>in Rs.</b> | <b>Amount in<br/>Rs.</b> |
| <b>001</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RWT009420001<br>CARBON DI OXIDE DOSING SYSTEM<br>AND ALL ACCESSORIES<br>AS PER TECHNICAL SPECIFICATION NO.<br>ROS 6295 REV 00 DATE 14.05.2020<br>ROS 4366 REV 00 DATE 20.05.2019 &<br>RELEVANT ANNEXURES.                                                                                                                                                                                                                                                                                                                                                                                           | ST          | 1.00        |                               |                          |
| <b>002</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RWT00950001<br>MANDATORY SPARES<br>FOR CARBON DI OXIDE DOSING SYSTEM<br>AS PER TECHNICAL SPECIFICATION NO.<br>ROS 6295 REV 00 DATE 14.05.2020<br>ROS 4366 REV 00 DATE 20.05.2019 &<br>ANNEXURE B                                                                                                                                                                                                                                                                                                                                                                                                    | ST          | 1.00        |                               |                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>A) Total Base Price (Total of Sl. No. 001 - 002)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |             |                               |                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>B) Packing &amp; Forwarding Charges (If Payable Extra by BHEL)_____%</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |                               |                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>C) Freight &amp; Insurance Charges (If Payable Extra by BHEL)_____%</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |             |                               |                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>D) Applicable percentage of CGST/SGST/UTGST/IGST - _____%</b><br>(whichever is applicable) for A+B+C+D<br>HSN CODE : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |             |                               |                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>E) Total Landed Cost( Sum of A+B+C+D+E)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |             |                               |                          |
| <b>IMPORTANT NOTES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1) All the Items are to be inspected by BHEL Engineers / BHEL Authorized Engineer and Customer / Consultant Engineer either jointly or individually before the despatch of the item at vendor works as per approved QAP.<br>2) ALL ITEMS WILL BE COMPARED ON SET BASIS & ORDER WILL BE PLACED ON A SINGLE VENDOR WHO IS THE LOWEST (L1).<br>3) Please confirm the supply completion with in <b>31.02.2020</b> or <b>6 Months</b> from the date of Manufacturing clearance, which ever is Later.<br>4) Vendor can also quote improved delivery date if any from the date of Manufacturing Clearance, |             |             |                               |                          |
| <b>Signature &amp; Seal of Offerer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |             |                               |                          |

| ANNEXURE - E<br>SPECIFICATION DEVIATION DISPOSITION REPORT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                          |                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Enquiry No.7700124E Dated 23-MAY-2020 Due on: 16-JUNE-2020 (NIT_ 53022)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        | SUPPLY OF CARBON DI OXIDE DOSING SYSTEM & ACCESSORIES<br>AND MANDATORY SPARES<br>FOR BANGLADESH MAITREE STPP 2 X 660 MW PROJECT<br>(INTERNATIONAL ORDER) | Vendor Name         |
| 1) ROS 6295 REV 00 DATE 14.05.2020 - TECHNICAL SPECIFICATION FOR CARBON DI OXIDE DOSING SYSTEM,<br>2) ROS 4366 REV 00 DATE 20.05.2019 - TECHNICAL SPECIFICATION FOR ELECTRICAL, CONTROL & INSTRUMENTATION<br>3) CO2 SYS : MAITREE REV 00 DATE 18.05.2020 - PRE-QUALIFICATION REQUIREMENT FOR CARBON DI OXIDE DOSING SYSTEM<br>4) ANNEXURE B - PAINTING,<br>5) ANNEXURE H – P & ID CARBON DI OXIDE DOSING SYSTEM,<br>6) ANNEXURE M – MANDATORY SPARES FOR CARBON DI OXIDE DOSING SYSTEM,<br>7) ANNEXURE C - SEAWORTHY PACKING SPEC. PE TS 888 100 A001 REV 00.<br>8) QAP / QP / MQP CUSTOMER SAMPLE FORMAT<br>9) ANNEXURE – Q FOR QAP / QP / MQP & INSPECTION. |        |                                                                                                                                                          |                     |
| Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Clause | Details Of Deviation With Reason                                                                                                                         | Disposition By BHEL |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                                                                                                                                          |                     |
| Signature Of Vendor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                                                                                                                                                          | Reviewed By         |
| “ AGREED DEVIATION “                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        | APPROVED BY                                                                                                                                              |                     |
| if any to be incorporated in the PO in the event of order.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                          |                     |

Date :

VENDOR's SIGNATURE WITH SEAL

*(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 3 MONTHS FROM THE DATE OF COMPLETION OF SUPPLIES)*

### **CONTRACT EXECUTION BANK GUARANTEE**

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "BHEL House", SIRI Fort, New Delhi 110 049) through its Boiler Auxiliaries Plant located at Ranipet – 632 406, (hereinafter called 'the Company') having entered into a contract with M/s.....  
..... hereinafter called 'the said contractor' which term includes 'suppliers' for the purpose of this Bond and under the terms and conditions of the Contract No.....Dt.....between BHEL, Ranipet and as per the Contract, the Contractor / Supplier is to furnish a Contract Execution Bank Guarantee for Rs.....in words.....  
.....for the due performance of the contract and for the fulfillment of all the terms and conditions of the contract.

Sign and seal of issuing bank  
Please affix Non Judicial Stamp  
here, as per Stamp Act

Bank Guarantee No.....Date.....Banker Name.....  
Bank Guarantee Value Rs.....

1. We.....  
.....  
.....(Bank's name, Branch, Place – address to be mentioned [herein after referred to as the Bank) at the request of.....  
.....(Contractor(s)] do hereby undertake to pay the company an amount not exceeding Rs.....in words  
.....  
.....  
.....against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said Contractor(s) of any of the terms and conditions contained in the said agreement.

2. We.....  
.....  
.....(name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the Contractor(s) 'failure to perform' the said agreement. 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.....in words.....  
.....

Sign and seal of issuing bank

Bank Guarantee No.....Date.....Banker Name.....  
Bank Guarantee Value Rs.....

3. We undertake to pay conditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We.....(name of 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 Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till Purchase Department of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (i) Unless a demand or claim under this guarantee is made on us in writing on or before .....(date) (After 3 months from the date of completion of supplies) we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date. (ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack. Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the Bank personally.

Sign and seal of issuing bank

Bank Guarantee No.....Date.....Banker Name.....  
Bank Guarantee Value Rs.....

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

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. The guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency of or change in the constitution of the Contractor, but shall in all respects and for all purpose be binding and operative until all payments of all moneys due or that may hereafter become due to the said company or settled irrespective of any liability or obligation of the Contractor under the said Contract.

9. It shall not be necessary for the company to proceed against the Contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained from the Contractor shall, at the time when proceedings are taken against the Guarantor hereunder be outstanding or unrealized.

10. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Ranipet, Tamilnadu Jurisdiction.

11. The Bank declares that it has powers to issue this Guarantee under the Bank's Memorandum and Articles of Association and the undersigned has full powers to do so on its behalf under the power granted to him by the proper authorities of the Bank.

12. We .....(name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we.....  
(name of Bank) have hereunto setout Bank Seal the.....  
day of.....month 20\_\_.

Sign and seal of issuing bank.

## **Online SRF Submission Procedure**

Following are the formalities to be completed by your company for registration purpose.

**NOTE: BEFORE PROCEEDING FOR ONLINE REGISTRATION " PLS READ STEPS FOR FILLING UP ONLINE REGISTRATION FORM - HELP MENU" - DETAILS ATTACHED WITH THIS MAIL**

With effect from 01.04.2015 onwards, we have migrated to online Supplier Registration Form (SRF) as per our Corporate guidelines. **Supplier Registration Form (SRF)** is to be fed in our BHEL website portal – **ie., PDF documents of SRF and its annexure as called for shall be signed by authorized signatory & uploaded in portal.**

We request to visit our Web Site : [www.bhel.com](http://www.bhel.com) and click under heading "Supplier Registration" and fill up the **"Supplier Registration Form"** which is available in the Online Supplier Registration Portal.

Or else, copy the following URL Link and paste in the web link address: [http://www.bhel.com/vender\\_registration/vender.php](http://www.bhel.com/vender_registration/vender.php) and proceed with.

Or else, type directly as <http://203.129.195.108>

**Click the button "search material"** on the home page of supplier registration portal and search thoroughly your required material / product

*After completing the material search then proceed for User Id & Password for filling up the details of registration requirements. **Note: If you are an already registered supplier with any of our BHEL Unit - pls select "existing permanent supplier" or else select "New Registration" and then proceed accordingly.***

**Please note that for a foreign suppliers' there is a separate format to be filled in, which may be taken care suitably.**

After successful submission of SRF along with all annexures as called for thro' online i.e., authorized signatory signed pdf documents of SRF and its annexures are to be uploaded thro' online portal and confirm the same in **"form dispatch"** area ie., registration part-4 – wherein supplier has to confirm that all the documents were submitted "online" and click the button **"confirm"**. After clicking confirmation button, the same will be appearing against BHEL Ranipet for registration.

Looking for a long successful & sustaining business association with BHEL.

## TERMS AND CONDITIONS FOR INDIGENOUS OFFERS

- a) **Quotations :** Each Tender should be sent in duplicate in a sealed cover. Inner cover should be sealed with tender's distinctive seal and superimposed with correct Tender No., item of supply and due date of opening. Tender should not be addressed to any individual's names but only by designation and shall be addressed to Dy. Manager/Purchase, BHARAT HEAVY ELECTRICALS LIMITED, BOILER AUXILIARIES PLANT, INDIRA GANDHI INDUSTRIAL COMPLEX, RANIPET, VELLORE DISTRICT - 632406, INDIA.
1. Detailed Technical Literature / Write up
2. Latest Catalogue covering the items in quote.
3. Detailed Dimensional Drawing.
- b) Tenders should be neatly typewritten and should be free from CORRECTION AND ERASURES. Corrections, if any, must be attested. All amount shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.
- c) Price should be net F.O.R. destination inclusive of risk in transit and remain valid for 90 days from the due date.
- d) If any Sales Tax is payable as extra to the quoted price it should be specifically stated in quotation failing which the purchaser will not be liable for payment of Sales Tax. Our TIN No. 33024364741 & CST Number 1141696.
- e) Products with I.S.I certification marks will be preferred.
- f) The applicable rate of excise duty shall be clearly indicated in the quote itself.
- g) The tenderer shall fill up the specification Deviation Disposition Report either NIL or the deviation taken by the tenderer against the Tender specification.
2. **Samples :** Wherever possible samples should be submitted separately whether specifically requested or not, so as to reach the purchase on or before the due date of the enquiry. They should be clearly marked with the Enquiry No. and the date on the outside cover to facilitate identification.
3. **Packing and Marking :** The supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.
4. **Terms of Payment :** Payment will be made within 45 days for MSME (Small / Micro) Vendors and 90 days for others after receipt and acceptance of materials at BHEL Stores or receipt of site acknowledgment in case of direct to site items of satisfactory receipt of materials at site. Where required by the purchase, the successful tenderer must send the operation and maintenance manuals, test certificates, drawings, etc., as called for, for the materials ordered. These should be sent immediately after despatch of the materials and a statement to that effect should be made in the invoice. Failure to comply with this provision will result in delay in payment of the bills. Goods despatched either by V.P.P. or by the documents presented through bank will not be accepted unless agreed to by the Purchaser.
- The transporter's copy of Excise Invoice should accompany the material. The Original Invoice alongwith other documents shall be (a) routed through bank or (b) directly sent to us as called for in the contract. One set of the Advance copies of the above documents shall be sent to Manager / Finance (Stores Bill section), BHEL, BAP, RANIPET - 6 and one set to Dy. Manager / Purchase BHEL, BAP, RANIPET - 6.
5. **Liquidated Damages :** It is clearly understood among the parties to the contract that "Time is the essence of the contract". Therefore, the delivery of the goods specified in the purchase order should be made within the time limit prescribed. Where the seller supplies or despatches the goods, beyond the delivery period specified, the Purchaser will have no obligation to accept the goods. If accepted, liquidated damages at the rate of 1/2% of the value of goods delayed for each week of delay or part thereof will be levied without prejudice to any other relief or compensation due to the purchaser under any other condition of this contract.
6. **Risk Purchase :** Alternatively, the purchaser at his option will be entitled the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefor. The supplier shall be liable for any loss which the purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in Clause 6 above.
7. **Preferential Delivery :** It should be noted that if a contract is placed on higher tenderer as a result of this invitation to tender in preference to the lowest acceptable offer in consideration to the earlier delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F.O.R. destination including all elements of freights, sales tax, duties and other incidentals in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.
8. **MODVAT CREDIT :** If any Excise duty is payable, the chapter 17 - head reference and the rate of duty

should be quoted. If the tenderer is availing MODVAT credit for the input material, the effect of proforma credit it should be passed on the purchaser. Tender under "MODVAT" shall be proforma.

9. **General :** a) The Purchaser reserves the right to split up the tender and place for individual items with different tenderers and also increase the quantity.

## TERMS AND CONDITIONS FOR FOREIGN OFFERS

**Offer :** Offer in ENGLISH LANGUAGE AND IN TRIPLICATE IN A SEALED COVER superscribing the enquiry number and due date shall be submitted addressed to : THE DY. MANAGER / PURCHASE, BHARAT HEAVY ELECTRICALS LIMITED, BOILER AUXILIARIES PLANT, INDIRA GANDHI INDUSTRIAL COMPLEX, RANIPET - 632 406, TAMIL NADU, INDIA.

Offers should be firm for net FOB / FCA nearest Sea / air port price and C & F Chennai Port Price indicating the shipping specifications and the earliest delivery in the respect of others from overseas suppliers.

### Documents :

- (i) Offers should be accompanied by detailed technical literature, catalogue and detailed dimensional drawing in ENGLISH and in TRIPLICATE, or otherwise the offers will not be considered.
- (ii) In case overseas suppliers route their accredited selling agents, a letter of authority should be furnished mentioning the name and address of their selling agents, who are authorised to bid, negotiate and conclude a contract on their behalf.

**Agency Commission :** In respect of offers from overseas suppliers, agency commission, if any, payable to their agents in India shall invariably be shown separately in the proforma invoice and this will be paid by us in India, in Indian Rupees, on satisfactory completion of the contract.

**Spare parts :** The tenderer should quote separately for spares that are required for two years trouble free operation. The spares offer should accompany the offer of main equipment, otherwise the quotation will be overlooked.

**Validity :** The offers for main equipment and spares shall be kept open for acceptance for 120 days (one hundred and twenty days) for the date of opening of the tender.

**Test Certificates, Operating and Maintenance Manuals :** The tenderer shall clearly mention in their offer that Test Certificates and Operating and Manuals, etc., as called for in technical specification, in the required number of copies will be provided at no extra cost. If any amount is payable as extra, the same shall be indicated separately in the offer.

**Terms and payment :** In the event of an order the purchaser will arrange for an unconfirmed irrevocable letter of credit against presentation of documents. Under, no circumstances confirmed irrevocable letter of credit will be established by the purchaser.

### General :

- (i) Preference will be given to suitable indigenous or ex-stock imported offers, failing which imported offers from incoming consignment against the indigenous supplies "Stock and sale Licence" will be accepted, if Stock and sale licence is not available with the indigenous suppliers, the same shall be indicated in their offer.
- (ii) The offer should reach us before the time of opening of tenders. The offer will be opened at 14.30 hours on the due date in the presence of the tenderers who may like to be present.
- (iii) **BANK GUARANTEE (if applicable) :** The supplier in the event of an order, should furnish a Bank Guarantee from an approved Bank at no extra cost in a proforma which will be supplied to the supplier, along with the order, for an amount equivalent to 10% of the value of the contract. The Bank Guarantee should remain in full force and effect during the period that would be taken of successful completion of the contract and shall continue to be enforceable till 12 months from the date of receipt of receipt of consignment at purchaser's site or 18 months from the date of last shipment at the port of Delivery, whichever is earlier.
- (iv) **INCOTERMS :** The definition for terms shall be as per Incoterms 2000
- (v) **PLEASE QUOTE YOUR RATE FOR ALL THE FOLLOWING CONDITIONS.**
  - (a) FOB on at sight L.C.
  - (b) On C & F Chennai Port India with at sight L.C.
  - (c) Rate on credit basis with rate of interest and period of credit.
  - (d) Rates with suppliers credit.

#### Payment Mechanism at BHEL, Ranipet

(Effective for all tenders issued by BHEL Ranipet from 01 July 2011 onwards unless otherwise notified of change/s in writing given by an authorized official of BHEL, Ranipet)

BHEL, Ranipet's payment mechanism will be as follows: (All Bidders are requested to read this carefully and take note of it before submitting their offer)

All bills of Suppliers processed for payment by BHEL, Ranipet shall pass through the following mile stones:

(1) Receipt of materials at BHEL, Ranipet Stores (evidenced by the Day-Book Number and Date generated at BHEL Stores, Ranipet) or Receipt of materials at Project Site / Destination specified in the Purchase Order (as evidenced by the acknowledgement given by the Consignee).

(2) Acceptance of the supplied materials at BHEL Stores, Ranipet. (Proof of evidence: Stores Receipt voucher - Short form "SRV", raised by BHEL Stores, Ranipet referenced by the SRV Number and Date)

(3) Receipt and Registration of the Bills / Invoices of the Supplier at BHEL, Ranipet Accounts Department. (evidenced by the ABS Number and Date)

(4) Receipt of clarifications, if any that may be required by BHEL, Ranipet Accounts or Purchase Department, from the Supplier. (As evidenced by the IOM Inward Date)

(5) Bill processing and passing.

(6) Payment release.

All these events are transparently available in the SCM web-site of BHEL, Ranipet, {<http://bapscm.bhelrpt.co.in/purc>} which can be viewed by all registered supplier with a password. Allowed Time frames:

A] From DB to SRV: 10 Days

B] From SRV to ABS: 15 Days

C] From ABS to Bill Pass: 07 Days (if Stage 4 above is not applicable)

OR

From IOM to Bill Pass: 07 Days (if Stage 4 above is applicable)

D] From Bill Pass to Payment Release: As per payment terms of the Purchase order.

All Suppliers payment/s would be released based on seniority of receipt of the processed bills at the payment section of BHEL, Ranipet Accounts Department.

The seniority would be based on the sequence of milestone events listed above.

In the sequence of the bill processing the preceding mile-stone seniority will be void, if the subsequent event occurs beyond the permitted time frame between two successive events.

Thus for example:

Start seniority would be with the DB date.

If the SRV date is greater than 10 days of the DB date, then the seniority of the DB date would be replaced by the SRV date.

If the ABS date is greater than 15 days of the SRV date, then the seniority would be reckoned by the ABS date.

If the Bill pass date is greater than 07 days of the ABS date then the seniority would be the date of inward receipt of the IOM.

The logics of these sequence is that SRV, ABS, IOM inward entry are dependent entirely on submission of correct documentation by Suppliers, as called for in the Purchase Order. If the documents are correctly submitted each of the milestone listed above will occur within BHEL, Ranipet within the timelines specified above.

Hence, in their own interest all Suppliers are requested to take note of this process and comply with the same.

Caution: Suppliers' payments would get delayed / affected if they fail to adhere to the submission of the documents specified in the Purchase Order / Contract, since the listed milestone events occurrence are contingent upon the availability of the requisite documents.

|                                                                                   |                                                          |                     |
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|                                                                                   |                                                          | REV: 00             |

BHARAT HEAVY ELECTRICALS LIMITED,  
RANIPET- 632 406.

TECHNICAL SPECIFICATION  
OF  
CO2 DOSING SYSTEM & ACCESSORIES  
FOR  
MAITREE PROJECT 2X660MW

|         |          |                        |                                       |                                 |             |
|---------|----------|------------------------|---------------------------------------|---------------------------------|-------------|
|         |          |                        |                                       |                                 |             |
|         |          |                        |                                       |                                 |             |
|         |          |                        |                                       |                                 |             |
|         |          |                        |                                       |                                 |             |
|         |          |                        |                                       |                                 |             |
|         |          |                        |                                       |                                 |             |
| 00      | 14.05.20 | <u>A. Kumar</u><br>ABH | <u>S. Sivaraman</u><br>19/05/20<br>SS | <u>J. M. Ramalingam</u><br>IMRL | Fresh issue |
| Rev. No | Date     | Prepared               | Checked                               | Approved                        | Remarks     |

|                                                                                   |                                                          |                     |
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## 1.0 SCOPE OF SUPPLY

The intent of this specification is to cover design, engineering, manufacturing, shop testing and hydro testing of the CO2 dosing system. The scope shall include but not limited to the following.

- a) Complete Skid Frame (MS Epoxy) for housing 9 cylinders each of capacity. 40 Kg. (1W+1S)
- b) CO2 Manifolds with required number of filling points to accommodate all the Carbon Dioxide Cylinders & acc.- 1 Set
- c) Ball Valve with Actuator & SOV- 1 Set
- d) Heater/evaporator required for above Carbon Dioxide Dosing System with all acc. - 1Set
- e) Manual Ball Valve with Acc. : 1-Set
- f) Pneumatic Flow Control Valve with all Acc.- 1 Set
- g) Pressure Relief Valves as per system requirement – 1 Set.
- h) Required number of Diffusers and mixers to meet the efficiency requirement of minimum 95 % CO2 dissolution to achieve automatic pH control. - 1 Set
- i) All type of valves required for the entire Carbon Dioxide Dosing System as per Tender P&ID is in bidder scope.- 1 Set
- j) 1 set of inter connecting piping between all equipment for the entire system including valves and accessories for auto operation of the plant as per P&ID
- k) Necessary foundation bolts for all the equipment.
- l) 1 set of miscellaneous items including fasteners, gaskets, ladders, common platforms, supports for piping & valves etc. as applicable.
- m) 1 set of Commissioning spares
- n) 1 set of Mandatory spares.
- o) All instruments are in BHEL Scope but Vendor has to provide the necessary tapping points in Pipe line to install Instruments as per P & ID.
- p) Any starter/control panel (if applicable)

|                                                                                   |                                                          |                     |
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Note: Any Other equipment required for the completeness of entire CO2 dosing system will be in bidder scope.

## 2.0 PROJECT INFORMATION

1. Owner : Bangladesh India Friendship Power Company Limited  
Bangladesh
2. Project Title : Maitree 2 x 660 MW STPP
3. Location : Khulna Dist., Bangladesh

## 3.0 TECHNICAL SPECIFICATION - MECHANICAL

PH control system is equipped with simple reliable and effective control systems and has a central PLC for monitoring of the system. The CO2 manifold system is designed to receive CO2 from cylinders, atmospheric evaporating and reducing it to lower pressure through Cold Reduction Station. In the given configuration, gaseous CO2 is taken through the manifold system delivering CO2 to the assembly. At this stage, a pressure reduction device adjusts the pressure of CO2 gas to the desired level for delivery into the CO2 gas injector. The pH controller delivers a signal for the flow control valve to dose adequately the CO2 into water side stream. This water shall then be returned to the main flow to correct the pH of main supply or CO2 gas is injected directly into water through special type of injector.

CO2 is transported in liquid phase in cylinders but it is used in the gaseous state for water applications. CO2 is evaporated and expanded to lower pressure for use and, in this expansion operation cooling occurs which can choke the entire system with dry ice, resulting in pressure oscillation and CO2 losses. Bidder should ensure to avoid such problems.

## 4.0 EQUIPMENT SPECIFICATIONS

### 4.1 SKID FRAME.

A skid shall be fabricated with MS channel and angles as per the approved drawing with good engineering practice. Two MS skid shall be provided by bidder suitable to assemble 9 nos. each of CO2 cylinders with capacity of 40 kg each (approximate pressure (80-100) bar). The cylinder's elevation and space between cylinders shall be suitably designed to facilitate easy operation for flow adjustment, valve operation, maintenance and loading etc.

Lifting hook arrangement shall also be provided. Painting shall be followed as given in the technical specification elsewhere.

### 4.2 HEATER / VAPORIZER

|                                                                                   |                                                          |                     |
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A Vaporizer is provided to vaporize the liquid CO<sub>2</sub> to gaseous state as per requirement. Vapour heater is provided to heat (-) 20C CO<sub>2</sub> to near room temperature. Both Vaporizer & vapour heater is to be provided with necessary safety instruments.

#### 4.3. DIFFUSER & MIXERS

Required number of mixers for mixing CO<sub>2</sub> with water inside the main pipeline. The size of Main Pipeline is 250NB GRP of PN10 rating. The working pressure in the main line is 3 bar. & the maximum pressure in the main line will be 3.5bar.

#### 4.4. VALVES

All Valves will be SS316 MOC.

#### 4.5. PIPING SYSTEM.

All the valves, strainer, interconnecting pipes shall be industrial grade, pressure rating as per system requirement, applicable standard pipe shall be considered.

CO<sub>2</sub> transfer pipe line from Cylinder to diffuser system shall be of 1" (DN 25) size with MOC SS316.

The distance of discharge piping from the skid to the process line (dosing point) will vary from 10 to 40 meters based on the site layout of different projects. The dosing system design should take care of this. The erection of pipe from skid to dosing point will be carried out by others.

ALL FLANGE DRILLING SHALL CONFIRM TO ANSI B-16.5 (Pressure rating as per system requirement)

Applicable bill of quantity, for this requirement, to cover all the system shall be separately offered by the bidder as called in the enquiry. Bidder shall also offer unit rates for pipe, fittings & valves etc., to order for any change in requirement based on detailed engineering. The expected quantity variation will be within + or (-) 20% for each item and will be finalized before order. However, any minor variation in requirements shall be taken care by the vendor without any commercial implications after ordering.

#### 4.6 Dosage Rates

| Sl. No. | Project | Reminrelisation Feed Pump Flow ( M3/hr) | Reminrelisation Feed Pump Head ( m) | Dosage (ppm) | Dosage Rate ( Kg/hr) |
|---------|---------|-----------------------------------------|-------------------------------------|--------------|----------------------|
| 2.0     | Maitree | 579                                     | 30                                  | 52           | (10-30)              |

|                                                                                   |                                                          |                     |
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#### 4.7 TERMINAL POINTS

Scope and terminal point details are indicated in the enclosed drawings, P & ID: No: Annexure H.

- a) Outlet of Cylinders (From Manifold) to the diffusers.
- b) Required number of diffusers to be installed in the main pipeline as per the P&ID.
- c) Requirement of piping, valves, external supports, etc. for the following lines shall be provided by the vendor. Total Piping for each project should be minimum 30m

#### 4.8 OTHER REQUIREMENTS

- a. All the interconnecting piping shall be SS316 industrial grade Schedule 80.
- b. The pipe size shall be minimum of dia. ½” or 1” as applicable
- c. The valves of union type socket end and the O rings shall be of either EPDM or VITON.
- d. All mounting fasteners : SS 316  
(Flanges, tank, pump etc.)
- e. Foundation Bolts : SS 316

Items though not mentioned but needed to make the system complete in all respects as stipulated under these specifications are also to be supplied unless otherwise specifically excluded.

#### 5.0 PAINTING(for skid frame)

As per the following Annexures :

- a) Annexure E : Maitree Project (R4N0)

#### 6.0 DESIGN AND CONSTRUCTION FEATURES

The following consideration shall be made during the design / selection of valves for the CO2 dosing System.

1. Bidder to select suitable material of construction for the valves based on the system requirement.
2. The end connection for the valves shall be of flanged type as per **ANSI B16.5 ( Pressure rating as per system requirement)**.

|                                                                                   |                                                          |                     |
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3. Pressure rating of valves should be as per system requirement
4. Necessary pneumatic actuated valves shall be provided for auto operation (option for manual opening and closing shall also be made available), of the plant as per the P & I D.
5. The painting shall be as per the requirements indicated in section No: 5.0
6. The check valves shall be of wafer type suitable for mounting between flanges.
7. The Material of Construction of the body and disc of check valve shall be SS 316.
8. All piping work above 5 bar design pressure shall be manufactured in PESO/equivalent statutory body approved manufactured facility. Bidder should ensure all pipes & fittings should meet the system requirement.

## 7.0 TECHNICAL SPECIFICATION FOR ELECTRICAL, CONTROLS & INSTRUMENTATION

As per the following EC&I specifications:

- a) ROS: 4366 – Maitree Project

## 8.0 TECHNICAL DETAILS FOR CIVIL WORKS

Necessary civil works like equipment foundation with pockets, acid resistant tiling, trenches etc., are excluded from the bidder's scope. However bidder shall provide the load details of all the equipment for civil design in their offer. Supply of foundation bolts for all the equipment is in bidder's cope.

## 9.0 MANDATORY SPARES

As per the following Annexures:

- a) Annexure B : Maitree Project (R4N0)

## 10.0 DOCUMENTATION:

The documentation during bid and post order stage shall meet the following requirements.

1. All documents and drawing shall be submitted in English.
2. Hard copies of all documents and drawings, in English, during bid stage to be submitted in duplicate.
3. Hard copies of all drawing and documents for approval shall be submitted in triplicate.

|                                                                                   |                                                          |                     |
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4. Hard copies of all final documents, drawings, erection manual, O&M manual etc., shall be submitted in bound folder in six.
5. Soft copies of all final documents in MS word / MS in the form of CD – 1 set
6. Soft copies of all final calculations in MS word / MS in the form of CD – 1 set
7. Soft copies of all final drawings in Auto Cad, latest version in the form of CD – 1 set

### 11.1 DOCUMENTS / DETAILS ALONG WITH BID

The following documents/ details shall be submitted along with the bid for scrutiny.

- a. Catalogues & typical drawings indicating system arrangement, dimensional details, Material of constructions etc.
- b. Typical Quality plan for supply of the above equipment.
- c. Reference list.
- d. Unpriced commercial offer on the scope of supply as per BHEL spec.
- e. Bidder to provide confirmation regarding the compatibility of the offered wetted parts MOC for the medium handled for all systems.
- f. Civil requirements.
- g. In case of any deviation, the Bidder shall indicate the same, clause by clause in the deviation schedule. In the absence of the same it will be construed that the bid confirms strictly to the specification.

Note: 1. Bidders to note that failing to submit the above documents, the bid shall be considered as incomplete and liable for rejection.

Note: 2. Bidder should provide offer for the dosing systems as called in the spec. They should also provide price break up for piping system spares etc.

### 11.2 DOCUMENTS AFTER ORDER:

The following documents / Drawings shall be furnished for BHEL / customer approval.

- i) Quality plan for supply of the above equipment in BHEL format (format will be provided after order).
- ii) General arrangement drawings of CO2 Dosing system.
- iii) Dosing/Injection head details.
- iv) Cross sectional drawings.

|                                                                                   |                                                          |                     |
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v) P&ID

The following documents/Drawings are to be furnished for BHEL / customer review and acceptance.

- i) Erection and O&M manuals.
- ii) List of despatch details for each system as per BHEL format (format will be provided after order).

Note: Purchase order number& Material code shall be marked / indicated in the system painted / tagged at suitable location for identification of components at site before dispatch.

## 12.0 INSPECTION

By BHEL's inspector or BHEL's authorized representative at Vendor's works.

## 13.0 PACKING & FORWARDING

Bidder to strictly follow SEA WORTHY PACKING as per Annexure G

|                                                                                   |                                                          |                     |
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| <i>Sl.<br/>No</i> | <i>Section<br/>No.</i> | <i>Clause<br/>No.</i> | <i>Page<br/>/ No.</i> | <i>Specification</i> | <i>Statement of<br/>Deviations/variatio</i> | <i>Reason for<br/>Deviation</i> |
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|  | <b>SPECIFICATION FOR ELECTRICAL,<br/>CONTROL &amp; INSTRUMENTATION<br/>(CO2 dosing)</b> | <b>SPEC. NO.: ROS 4366<br/>REV 00</b> |
|                                                                                   |                                                                                         | <b>PART OF ROS 6295</b>               |

**TECHNICAL SPECIFICATION FOR  
ELECTRICAL, CONTROLS & INSTRUMENTATION  
(Applicable for Co2 Dosing Maitree project)**

|         |          |                       |                             |                                |             |
|---------|----------|-----------------------|-----------------------------|--------------------------------|-------------|
|         |          |                       |                             |                                |             |
|         |          |                       |                             |                                |             |
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|         |          |                       |                             |                                |             |
|         |          |                       |                             |                                |             |
| 00      | 20.05.20 | <i>MKV</i><br>20/5/20 | <i>Rajabekha</i><br>20/5/20 | <i>G. M. Kamlin</i><br>20/5/20 | Fresh issue |
| Rev. No | Date     | Prepared              | Checked                     | Approved                       | Remarks     |

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|  | <b>SPECIFICATION FOR ELECTRICAL,<br/>CONTROL &amp; INSTRUMENTATION<br/>(CO2 dosing)</b> | <b>SPEC. NO.: ROS 4366<br/>REV 00</b> |
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#### 1.0.0 Climatic conditions in the site area – Plant Ambient Conditions:

- Ambient Temperature 31 °C
- Ambient Humidity 88 %
- Maximum design temperature (outdoor) 45°C

#### 1.0.1 Reference Standards

The design and manufacture of all electrical equipment shall comply with the latest editions of the IEC Recommendations if not specified otherwise elsewhere in the specification. Compliance with ANSI/IEEE/NEMA, BS, EN or VDE standards will only be accepted in case no applicable IEC standards are available and subject to approval by the Employer's engineer.

#### 1.0.2 Voltage levels

The following voltage levels shall apply:

- 240 V + 10%, 50 Hz standard voltage for power supplies to small electric power consumers and motors below 0.2 KW.
- 415 V + 10%, 50 Hz voltage for power supply of essential electric power consumers - the system shall be operated with solid grounded neutral

1.0.3 Installation conditions and protection class for electrical operational equipment and control and monitoring equipment. If not specified otherwise the electrical operational equipment must be designed to meet protection classes stated below.

Switchgear, housings for electrical equipment and electrical equipment itself must be designed according to IEC 60529 at least to:

- Class IP 41 if located indoors in air-conditioned/ventilated areas
- Class IP 54 if located indoors
- Class IP 65 for all I&C field devices
- Class IP 55 for motors located outdoors and in indoor areas with high dust and humidity
- Class IP 65 for other outdoor electrical and control system equipment such as cubicles or panels with additional measures) if located outdoors in accordance with IEC 60529 (degrees of protection provided by enclosures (IP Code) or equivalent).

The additional measures shall consist of sunshades, protection covers against splashing water, additional sealing, special acid resistive coating etc., depending upon the particular site conditions at the place of installation, subject to the approval of the Employer.

#### 2.0.0 Technical conditions for low voltage motors

All motors must be designed to meet IP 55 enclosure according IEC60034-5 and rated for design ambient conditions for Electrical Systems prevailing at project site. All motors shall be chosen for **non-hazardous SAFE area** application.

- Relative Humidity 88%
- Maximum design temperature (outdoor) 45°C
- Maximum design temperature of the electrical equipment installed indoors non in air conditioned rooms 45°C
- Low Voltage 415 V +/-10 %, 3 Ph, 50 Hz+/-5% ,10 % (Absolute sum)
- Space heater supply 230V+/-10%, 1Ph, 50Hz+/-5%, 10% (Absolute sum)

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All motors with rated power (referred to 40 °C ambient temp.) less than 160 KW must be designed as LV motors with premium efficiency class IE3 as per IEC 60034-30.

## Design

### Constructive features

The following constructive features shall apply:

- Climatic protection provisions for mounting in the open in a humid and hot climate. All insulated winding shall be of copper with Insulation class F. During operation at rated power of the driven machine, the motor insulation must only be stressed in accordance with the requirements of class B insulation.
- Motor parts made of iron internally and externally sandblasted and surface-protected.
- Paint finish resistant to chemicals and seawater. Color shade shall be RAL 5012(Light Blue).
- Bolts with adequate corrosion protection.
- All joint faces and gaps sealed.
- Anti-condensation heating provision is to be used when the motor feed circuit is in the 'off' position. Heater supply power 'on' indicating lamp is to be provided. Anti-condensing heating shall be provided for motors of **55 kW** and above.
- Special treatment of windings with resin impregnation plus immersion in varnish. Varnish-insulated laminations. Pressboard material protected by varnishing.
- Totally enclosed fan cooled (TEFC) type/ IC 411 as per IEC 60034-6. For motor ratings the cooling air available at the specific location has to be considered. Motors shall be designed with cooling fans suitable for both directions of rotation. Motors shall not be provided with any electric or pneumatic operated external fan for cooling the motors.
- Condensation outlets to be provided at the lowest point in the housing.

Design and construction of the motors shall comply with IEC 60034-1, 60034-5 or VDE 0530 and DIN 40050.

### Electric features

The following electric features shall apply:

- Motor rating to be at least 110% of the maximum required electric power consumption of the driven machine.
- Continuous delivery of rated power at voltages of 90 - 110% of the rated voltage and allowable frequency range within the limits of thermal class F.
- Rated power output at ambient temperatures existing at the particular site of installation and under continuous running conditions.
- All motors shall be designed as 3-phase squirrel-cage motors suitable for direct on line starting. It must be possible, with 100% residual voltage, to switch them on to a large and stable power supply

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network without incurring damage or deformation. The motors must still be capable of faultless running up to speed with a voltage drop to 80% of rated voltage and rated loading.

e. Motor starting current must not exceed the voltage drop at direct-on-line starting should be limited to 20% at the motor terminals. However starting of any motor shall not cause tripping of any other consumer. The motor shall be capable of withstanding the stresses imposed if started at 110% rated voltage.

f. The following frequency of starts shall apply

- i) Two starts in succession with the motor being initially at a temperature not exceeding the rated load operating temperature.
- ii) Three equally spread starts in an hour the motor being initially at a temperature not exceeding the rated load operating temperature. (not to be repeated in the second successive hour)

For motors with starting time upto 20 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 3 seconds more than starting time. Minimum permissible starting voltage is 85% of rated voltage for rating below 110KW and 80% of rated voltage for ratings from 110KW to 160KW.

g. A minimum frequency of starting cycles of 1000 per year must be guaranteed.

h. In general, motors must be capable of running without overheating when subjected to three consecutive starts within one hour after having run for an extended period on a voltage of 95% nominal voltage. Thereby the second start must be possible immediately after the first start and the third 30 minutes after the second start.

i. Motors shall withstand the voltage, heavy inrush transient current, mechanical and torque stress developed due to the application of 150% of the rated voltage for at least 1 sec. caused due to vector difference between the motor residual voltage and the incoming supply voltage during occasional auto bus transfer. Motor and driven equipment shafts shall be adequately sized to satisfactorily withstand transient torque under above condition.

**j. All motors shall be designed as 3-phase squirrel-cage motors suitable for direct on line starting.** The motors must be capable of being switched on to a large and stable network and with phases in opposition. Motors starting current must comply with the starting current specification of IEC 60034. However the motors starting current must not exceed 7.0 times rated current (referred to the motor rating and 40 °C ambient temp).

Motors that are operated through VFD as per process requirement shall meet IEC 60034-17 and the motor insulation shall be able to withstand the peak voltage, dV/dt and rise time as specified in IEC 60034-17 (for standard motors when controlled by VFD drives). In addition, these motors shall be provided with insulated bearings from motor frame size 160 and onwards on the non-driving end side of the motor. Vacuum Pressure Impregnation (VPI) shall be provided to windings for motors identified with VFD operation. This shall also have no additional cost implication to BHEL.

k. The frame of each motor shall be provided with two separate and distinct grounding pads complete with tapped hole, GI bolts and washer. An earthing clamp inside the terminal box has to be provided. All cable connecting boxes are to be designed to meet the requirements of IP 55 or IP 58 protection class respectively. The cable connecting boxes are to be installed easily accessible on the motor. The

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connecting boxes must be capable of being turned by 90° or 180° and of being opened up longitudinally. The connection boxes are to be fitted with a terminal block.

l. Terminals, terminal leads, terminal boxes, windings tails and associated equipment shall be suitable for connection to a supply system having a short circuit level, specified below. Unless otherwise stated, motors of rating including 110 kW and above will be controlled by circuit breaker and below 110 kW by switch fuse-contactor. The terminal box of motors shall be designed for the fault current. Short time rating for terminal boxes below 110 kW (Contactor controlled) shall be 50 KA protected by fuse for 0.25 sec.

m. Unless otherwise specified or approved, phase terminal boxes of horizontal motors shall be positioned on the left hand side of the motor when viewed from the non-driving end.

n. Noise level measurement and vibration measurement as per IEC standards. The peak amplitude of vibration shall be as per IEC 60034-14. Noise level shall be within the limits specified by IEC 60034-09.

### **Inspection and Testing**

By BHEL/BHEL authorised agency at vendor works. All motors shall be subjected to routine tests.

### **Drawings to be submitted after award of contract**

- a) OGA drawing showing the position of terminal boxes, earthing connections etc.
- b) Arrangement drawing of terminal boxes.
- c) Characteristic curves:
  - i) Current vs. time at rated voltage and minimum starting voltage.
  - ii) Speed vs. time at rated voltage and minimum starting voltage.
  - iii) Torque vs. speed at rated voltage and minimum voltage.
  - iv) Thermal withstand curve under hot and cold conditions at rated voltage and max. permissible voltage.

### **Sub Vendor List for LT Motors**

1. KEC Bangalore/Hubli
2. Siemens Mumbai
3. CGL Ahmednagar
4. BBL Mumbai
5. ABB Faridabad/ Bangalore
6. Marathon Kolkata
7. Jyoti Vadodara
8. LHP Solapur
9. NGEF Hubli

### **2.1.0 Technical conditions for low voltage heater**

Heater shall be designed to 415 V + 10%, 50 Hz power supply. Terminal studs shall have adequate protection against dust and moisture entry during operation. Paint finish resistant to chemicals and seawater. Bolts with adequate corrosion protection. All joint faces and gaps sealed.

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### 3.0.0 Pneumatic Actuator & Accessories For On-Off Valve

|       |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1.  | Quantity                                 | 01 No. for each Pneumatic Operated Valve (POV)                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1.2.  | Type                                     | Pneumatic Rotary (Rack & Pinion) Double acting for quarter turn ball valve or<br>Linear actuator for globe or needle valve                                                                                                                                                                                                                                                                                                                          |
| 1.3.  | Pressure                                 | 4-7 Kg /sq. cm of dry instrument air                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1.4.  | Air Connection size                      | 1/4" NPT(F)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1.5.  | Hand wheel for manual operation          | Required                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.6.  | State of driven equipment on air failure | Stay put                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.7.  | Output capacity                          | Vendor to select to suit requirement of valve type, size & rating.                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.8.  | Limit Switch                             | One for Open & one for Close position for each POV with 2 NO+2NC potential free contacts in each limit switch. Contact rating shall be 5A,240V AC , 0.5A, 220 V DC. Enclosure shall be weather proof IP 55. Limit Switch terminals shall be brought out to a Terminal.                                                                                                                                                                              |
| 1.9.  | Solenoid Valve                           | 5/2 way Solenoid valve suitable for double acting actuator.<br>Single Solenoid Coil / Double Solenoid coil as decided during detail engineering<br>Body: SS316<br>Duty: Continuous<br>Coil Voltage: 24 V DC<br>Class of insulation: "F "<br>Manual override for each SOV : Required                                                                                                                                                                 |
| 1.10. | Air Filter Regulator                     | Quantity: One for each valve.<br>Type: Manual Drain<br>Inlet :4 – 7 Kg / sq. cm<br>Filtering particles: > 5 microns<br>Filter Element: Sintered bronze/Phosphor Bronze/Polypropylene<br>Output pressure: 0 – 7 Kg / sq. cm<br>Output Gauge Range : 0-10 Kg/sq.cm<br>Output Pressure Gauge dial: 50 mm Diameter.<br>Blow down valve: To be provided<br>Air connection Inlet :Suitable SS316 end fittings to be provided for 1/4" NPT copper/SS tube. |

### 3.0.1 Pneumatic Actuator & Accessories For flow control valve

|     |                                 |                                                                                                                              |
|-----|---------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1.1 | Quantity                        | 01 No. for each Pneumatic Operated Valve (POV)                                                                               |
| 1.2 | Type                            | Pneumatic Rotary (Rack & Pinion) Double acting for quarter turn ball valve or<br>Linear actuator for globe or needle valve   |
| 1.3 | Air Connection size             | 1/4" NPT(F)                                                                                                                  |
| 1.4 | Hand wheel for manual operation | Required                                                                                                                     |
| 1.5 | Output capacity                 | Vendor to select to suit requirement of valve type, size & rating.                                                           |
| 1.6 | Positioner                      | Smart type with HART communication protocol, With regulating input as 2 wire 4-20 mA (24 V). Housed in cast aluminium casing |

|                                                                                   |                                                                                         |                                       |
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|     |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                            | (with polyurethane paint); IP65 degree of protection for enclosure. Material of accessories shall be SS. The allowable drift rate will be +2% of set point/ hour maximum. The positioner shall be mounted on the actuator.                                                                                                                                                                                                                                                |
| 1.7 | Valve position transmitter | Required with output indicating position of valve as 2 wire 4-20 mA (24 V).                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.8 | Air Filter Regulator       | Quantity: One for each valve.<br>Type: Manual Drain<br>Inlet :4 – 7 Kg / sq. cm of dry instrument air<br>Filtering particles: > 5 microns<br>Filter Element: Sintered bronze/Phosphor Bronze/Polypropylene<br>Output pressure: 0 – 7 Kg / sq. cm<br>Output Gauge Range : 0-10 Kg/sq.cm<br>Output Pressure Gauge dial: 50 mm Diameter.<br>Blow down valve: To be provided<br>Air connection Inlet: Suitable SS316 end fittings to be provided for 1/4" NPT copper/SS tube. |

### 3.0.2 Temperature Transmitter with Duplex RTD & thermowell (TIT)

Temperature Transmitter - Head Mounted type, 4-20mA, 24 V DC, 4 wire Duplex RTD-PT100 Class –A accuracy, SS316 Thermowell Insertion Length suitable for application medium, 1" ANSI 150 Flanged. Enclosure protected for IP 65.

### 3.0.3 Pressure Transmitter (PIT)

SMART Pressure Transmitter - 4-20mA, 24 V DC, suitable for application medium, 1" ANSI 150 Flanged process connection. All transmitters shall have a local indicator displaying appropriate physical units which may be read clearly from an easily accessible position. Transmitters with accuracy class 0 or better must be used. The repeatability shall be within a range of 0.1% of full span. Enclosure protected for IP 65.

### 3.0.4 Flow Indicating Transmitter (FIT)

The MOC selected shall be suitable for the fluid being dosed at the maximum pressure and flow conditions available at the piping. Flow gauges are to be firmly fitted with supports within the skid with isolation and bypass valves.

|                    |                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------|
| Application        | Co2 gas medium                                                                                                           |
| Type               | Metal Tube with Indicator with 4-20mA output, 24v DC two wire                                                            |
| Wetted parts MOC   | MOC suitable for the medium SS316 or PTFE lining over metal tube for corrosive service                                   |
| Graduated Scale    | Engraved black on white background.<br>The lower-range value shall be considered within 10-15% of the upper range value. |
| Process connection | Process flow: Inlet- Down and Outlet-Up.<br>Flanged as per ANSI B16.5 Class 150 for online mounting in piping            |
| Temperature        | Ambient                                                                                                                  |

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|                           |                                                      |
|---------------------------|------------------------------------------------------|
| Accuracy                  | +/-5% of Full Scale or better                        |
| Isolation & Bypass Valves | Required in SS316 MOC for valve isolation and bypass |

### 3.0.5 Pressure Indicator (PI)

The MOC selected shall be suitable for the fluid being dosed at the maximum pressure and flow conditions available at the piping. Pressure gauges of class 1.6 or better must be used. The standard measuring ranges must be selected with regard to the maximum operating pressure. A pressure instrument installed for measurement of steady pressure at varying pressure shall operate in a band centered on 60% of its maximum range. Pressure gauges shall have a dial size of 160 mm and shall be located in such a way that they can be easily observed.

### 4.0.0 DRAWING/DOCUMENT SUBMISSION AFTER ORDER

|                                                                        |                                                                                                                                                                                        |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drawings & Documents to be submitted for LT Motors, Heater             | 1. Datasheet of LT motor, heater<br>2. Original certified copies of all test report for motor, TB etc.                                                                                 |
| Drawings & Documents to be submitted for PURCHASER'S DCS               | 1. Documents such as Sequential Flow Chart, Control logic chart, valve sequence chart, Alarm list, Control schemes (Block Logic) for the system<br>2. Control philosophy of Co2 system |
| Drawings & Documents to be submitted for Instrumentation               | 1. Instrument Schedule containing instrument wise range, set point, process connection, alarm/trip interlock with tags as per PID.<br>2. Instrument datasheets, test certificates      |
| Drawings & Documents to be submitted for Control Valves, ON OFF valves | 1. Datasheet/drawing of Pneumatic valves, limit switch, positioner, Air filter regulator with make model catalogue details etc.                                                        |

### 5.1.0 ELECTRICAL AND C&I SCOPE OF SUPPLY & SITE SERVICES BY BIDDER

| SL   | ELECTRICAL, C&I SYSTEM SCOPE OF SUPPLY BY BIDDER                                                                                                             |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1. | Supply of LT Motors, heaters as required for CO2 dosing plant                                                                                                |
| 1.2. | Supply of pneumatic operated ball valves , pneumatic operated control valves as per tender                                                                   |
| 1.3. | Supply of instruments as per tender PID                                                                                                                      |
| 1.4. | Supply of necessary instrument tapings with isolating valves (Preferably flange end connections ) are to be provided in the process pipe line at appropriate |

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|     |                                                                                                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------|
|     | location for connecting the instruments (as pressure transmitters, temperature transmitter, flow indicating transmitter etc.) |
|     | <b>ELECTRICAL, C&amp;I SYSTEM SCOPE OF SITE SERVICES BY BIDDER</b>                                                            |
| 2.1 | Vendor shall render all technical assistance in implementing the sequential operation logic of their system with the DCS.     |
| 2.2 | Commissioning & trial operation of CO2 DOSING system including all accessories by automatic operation through DCS.            |

#### 5.1.1 ELECTRICAL AND C&I SCOPE OF WORK BETWEEN BHEL & BIDDER

| SL. | SYSTEM                                                  | ACTIVITY     | AGENCY |
|-----|---------------------------------------------------------|--------------|--------|
| 1   | 415V MCC PANEL                                          | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 2   | LT POWER & CONTROL CABLES                               | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 3   | INSTRUMENTATION CABLES<br>- JUNCTION BOX & MCC TO DCS   | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 4   | LOCAL PUSH BUTTON STATION                               | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 5   | EQUIPMENT EARTHING                                      | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 6   | JUNCTION BOXES                                          | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 7   | CABLE TRAYS & ACCESSORIES                               | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 8   | BELOW GROUND EARTHING, LIGHTING,<br>A/C AND VENTILATION | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 9   | INSTRUMENT AIR LINE DISTRIBUTION                        | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
| 10  | INSTRUMENTS- PIT, TIT, FIT, PI                          | SUPPLY       | BIDDER |
|     |                                                         | ERECTION     | BHEL   |
|     |                                                         | COMMG.ASSIST | BIDDER |
| 11  | INSTRUMENT TAPPING, VALVES,<br>HARDWARE AND FITTINGS    | SUPPLY       | BIDDER |
|     |                                                         | ERECTION     | BHEL   |
|     |                                                         | COMMG.ASSIST | BIDDER |
| 12  | PNEUMATIC Control Valves, ON OFF<br>valves              | SUPPLY       | BIDDER |
|     |                                                         | ERECTION     | BHEL   |
|     |                                                         | COMMG.ASSIST | BIDDER |
| 13  | DCS SYSTEM                                              | SUPPLY       | BHEL   |
|     |                                                         | ERECTION     | BHEL   |
|     |                                                         | COMMG.ASSIST | BIDDER |
| 14  | LT MOTORS                                               | SUPPLY       | BIDDER |
|     |                                                         | ERECTION     | BHEL   |
|     |                                                         | COMMG.ASSIST | BIDDER |
| 15  | LT Heaters                                              | SUPPLY       | BIDDER |
|     |                                                         | ERECTION     | BHEL   |
|     |                                                         | COMMG.ASSIST | BIDDER |

|                                                                                   |                                                                                         |                                       |
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#### **4.0.1 DRAWING/DOCUMENT SUBMISSION AT OFFER STAGE**

The bidder shall submit the following documents along with the offer:

1. Signed confirmation of enquiry specification in total.
2. Electrical Load List indicating KW rating and no. of drives.

|                                                                                   |                                                                                                                                           |              |                         |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------|
|  | <b>BHEL: BAP: RANIPET</b><br><b>Water Systems</b><br><b>Pre-Qualification Requirement (QR)</b><br><b>for CARBON DIOXIDE DOSING SYSTEM</b> | <b>Ref:</b>  | <b>CO2 SYS :MAITREE</b> |
|                                                                                   |                                                                                                                                           | <b>Dt:</b>   | <b>18.05.2020</b>       |
|                                                                                   |                                                                                                                                           | <b>Rev :</b> | <b>00</b>               |

The Qualification requirements for Carbon Dioxide Dosing System are listed below and bidders should meet the same.

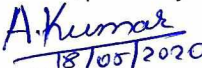
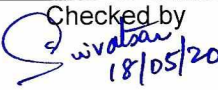
**CARBON DIOXIDE DOSING SYSTEM:** Bidder should have Designed, Manufactured and supplied Carbon Dioxide Dosing System comprising of Heaters/Evaporators, Instruments, valves, piping & diffusers. The total capacity of the reference Carbon Dioxide Dosing System should not be less than 10 kg/hr with each stream capacity not less than 10 kg/hr. Such Carbon Dioxide Dosing System should have been supplied at least one (1) year as on date of technical bid opening.

Documentary evidence to be submitted by the bidder (in support of meeting Qualification requirement) along with the bid.

1. Purchase Order copy for the reference plant
2. Supporting documents clearly indicating capacity of Carbon Dioxide Dosing System.

General:

1. Bidders who defaulted, in any of the previous tenders floated by BHEL are not permitted to respond. Such offers, if found later, will not be considered for evaluation.
2. After receipt of offers, during scrutiny, if any vendor found to have been banned by BHEL, then their offer will be summarily rejected at any stage.
3. In case BHEL decides, bidder to arrange necessary permission to visit the reference plant furnished by the bidder for meeting the PQR requirements.

|                                                                                                                                   |                                                                                                                               |                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Prepared by<br><br>18/05/2020<br>Abhinav Kumar | Checked by<br><br>18/05/20<br>S. Srivatsan | Approved by<br><br>IMRL Rao |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|

|                                                                                   |                                                                                                              |       |                  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------|------------------|
|  | BHEL: BAP: RAIPET<br>Water Systems<br>Pre-Qualification Requirement (QR)<br>for CARBON DIOXIDE DOSING SYSTEM | Ref:  | CO2 SYS :MAITREE |
|                                                                                   |                                                                                                              | Dt:   | 18.05.2020       |
|                                                                                   |                                                                                                              | Rev : | 00               |

## Annexure-I

### Qualification Requirement Datasheet

#### A. Customer details: -

- a) Name :
- b) Designation :
- c) Mobile :
- d) Land line :
- e) Fax :
- f) Email id :
- g) Postal address :

#### B. Plant Details: -

Date of Supply :

Date of commissioning:

| Sl. No. | Parameters                                   | Unit  | Description |
|---------|----------------------------------------------|-------|-------------|
| 1.      | Number of streams                            | Nos   |             |
| 2.      | Capacity of each stream of CO2 Dosing System | kg/hr |             |
| 3.      | Number of Cylinders                          | No.   |             |
| 4.      | Application                                  |       |             |

Signature of the Vendor

## Annexure - B

| Coating Systems |                                                        |                |                     |                                          |                         |                                                                |                                      |                                       |
|-----------------|--------------------------------------------------------|----------------|---------------------|------------------------------------------|-------------------------|----------------------------------------------------------------|--------------------------------------|---------------------------------------|
| System-No.      | Surface location                                       | Temp. °C       | Surface preparation | Coating systems                          | No. of coats            | Generic type                                                   | Dry film thickness (DFT) per coat µm | Total DFT µm                          |
| 1               | Structural steel works, piping, vessels, tanks INDOOR  | up to 120      | SA 2.5              | Primer<br><br>Finish                     | 1<br><br>1              | Zinc-Epoxy<br><br>Epoxy High Solid                             | 80<br><br>80                         | 80<br><br>$\frac{80}{160}$            |
| 2               | Structural steel works, piping, vessels, tanks OUTDOOR | up to 120      | SA 2.5              | Primer<br><br>Intermediate<br><br>Finish | 1<br><br>1 – 2<br><br>1 | Zinc-Epoxy<br><br>Epoxy High Solid<br><br>2-Comp. Polyurethane | 80<br><br>160<br><br>50              | 80<br><br>160<br><br>$\frac{50}{290}$ |
| 3               | Piping, tanks, etc. INDOOR and OUTDOOR, Insulated      | up to 120      | SA 2.5              | Primer                                   | 1                       | Zinc-Epoxy                                                     | 50                                   | 50                                    |
| 4               | Pumps, motors, other equipment OUTDOOR                 | up to 120      | SA 2.5              | Primer<br><br>Intermediate<br><br>Finish | 1<br><br>1<br><br>1     | Zinc-Epoxy<br><br>Epoxy High Solid<br><br>2-Comp. Polyurethane | 80<br><br>110<br><br>50              | 80<br><br>110<br><br>$\frac{50}{240}$ |
| 5               | Pumps, motors, other equipment INDOOR                  | up to 120      | SA 2.5              | Primer<br><br>Finish                     | 1<br><br>2              | Zinc-Epoxy<br><br>Epoxy High Solid                             | 80<br><br>50                         | 80<br><br>$\frac{100}{180}$           |
| 6               | Piping, reactors OUTDOOR Insulated                     | > 120          | SA 2.5              | Primer                                   | 1                       | Zinc Ethylsilicate                                             | 75                                   | 75                                    |
| 7               | Stacks OUTDOOR                                         | < 120<br>< 200 | SA 2.5              | Primer<br><br>Finish                     | 1<br><br>2              | Zinc Ethylsilicate<br><br>Silicone Acrylic                     | 75<br><br>50                         | 75<br><br>$\frac{100}{175}$           |

| Coating Systems |                                                                                |                                                                                                 |                                                                                                                            |                                                                          |              |                                          |                                      |                 |
|-----------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------|------------------------------------------|--------------------------------------|-----------------|
| System-No.      | Surface location                                                               | Temp. °C                                                                                        | Surface preparation                                                                                                        | Coating systems                                                          | No. of coats | Generic type                             | Dry film thickness (DFT) per coat µm | Total DFT µm    |
| 8               | Steel surfaces<br>Uninsulated                                                  | 200 - 450                                                                                       | SA 2.5                                                                                                                     | Primer<br>Finish                                                         | 1<br>2       | Zinc Ethylsilicate<br>Silicone Aluminium | 75<br>25                             | 75<br>50<br>125 |
| 9               | Galvanized surfaces                                                            | up to 120                                                                                       | Mechanical cleaning from contaminants and zinc salts by means of washing or steam jetting or sweep-blasting with fine sand | When Finish Coat is required, such as sea climate with chloride exposure | 1            | Epoxy High Solid*                        | 125                                  | 125             |
| 10              | Steel surfaces permanently in contact with water, also river water splash zone | Medium temp. °C up to 60                                                                        | SA 2.5                                                                                                                     | Prime and Finish Coat in One                                             | 1            | Glassflake reinforced High Solid Epoxy   | 500                                  | 500             |
| 11              | Plant / Cooling water pipes                                                    | GRP, or steel lined concrete pipes with cathodic protection and coating according to AWWA C 203 |                                                                                                                            |                                                                          |              |                                          |                                      |                 |

\* Additional 1 x Finish Coat 2-Comp. Polyurethane, 50 µm, when exposed to UV or weathering conditions and colour retention is required.

### Equipment and Piping Colour Code

For colour code for all equipment and piping see table below, for any other items Employer's approval shall be obtained. For safety issues relevant standards and regulations shall prevail in case of discrepancy. Final colour selection is to be discussed and approved by Employer.

#### Colour Code (based on DIN 2403:2007-05 & DIN 5381)

| Medium                                                                                                             | Base                                                               | RAL  | Band/<br>Ring | RAL  | Let-<br>tering | RAL  |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------|---------------|------|----------------|------|
| Flammable liquids and solids e.g. high speed diesel, lube oil, seal oil, hydraulic oil, coal                       | Signal Brown                                                       | 8002 | Signal Red    | 3001 | Signal White   | 9003 |
| Flammable gases e.g. hydrogen                                                                                      | Signal Yellow                                                      | 1003 | Signal Red    | 3001 | Signal Black   | 9004 |
| Non-flammable liquids and solids e.g. ash                                                                          | Signal Brown                                                       | 8002 | Signal Black  | 9004 | Signal White   | 9003 |
| Non-flammable gases e.g. nitrogen, carbon dioxide                                                                  | Signal Yellow                                                      | 1003 | Signal Black  | 9004 | Signal Black   | 9004 |
| Fire fighting, e.g. fire fighting water                                                                            | Signal Red                                                         | 3001 |               |      | Signal White   | 9003 |
| Water e.g. service-, demin-, condensate, feed-, river-, cooling-, closed cooling water; except fire fighting water | Signal Green                                                       | 6032 |               |      | Signal White   | 9003 |
| Steam e.g. main steam, HRH, CRH, aux. steam                                                                        | Signal Red                                                         | 3001 |               |      | Signal White   | 9003 |
| Acids e.g. HCl, ferrous sulphate                                                                                   | Signal Orange                                                      | 2010 |               |      | Signal Black   | 9004 |
| Alkali, e.g. ammonia, caustic                                                                                      | Signal Violet                                                      | 4008 |               |      | Signal White   | 9003 |
| Air e.g. station air, service air, instrument air                                                                  | Signal White                                                       | 9003 |               |      | Signal Black   | 9004 |
| Oxygen                                                                                                             | Signal Blue                                                        | 5005 |               |      | Signal White   | 9003 |
| Driven machines (e.g. fans and pumps) including motor; Vents, drains, vacuum                                       | Follow medium color                                                |      |               |      |                |      |
| Structural steel, steel skids for equipment                                                                        | Window Grey RAL 7040                                               |      |               |      |                |      |
| Safety caution, e.g. fall or trip hazards, handrails, head room clearance                                          | Alternating stripes Signal Yellow RAL 1003 / Signal Black RAL 9004 |      |               |      |                |      |
| Panels, cubicles, junction boxes                                                                                   | Light Grey RAL 7035                                                |      |               |      |                |      |

**VOLUME IIB**

**TECHNICAL SPECIFICATION  
FOR  
SEAWORTHY PACKING FOR EXPORT JOBS**

**SPECIFICATION NO. PE-TS-888-100-A001**



**BHARAT HEAVY ELECTRICALS LIMITED  
POWER SECTOR  
PROJECT ENGINEERING MANAGEMENT  
NEW DELHI, INDIA**

|                                                                                   |                                                                                                  |                                             |                 |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------|
|  | <b>TITLE</b><br><br><b>TECHNICAL SPECIFICATION<br/>FOR SEAWORTHY PACKING<br/>FOR EXPORT JOBS</b> | SPECIFICATION NO. <b>PE-TS-888-100-A001</b> |                 |
|                                                                                   |                                                                                                  | VOLUME II B                                 |                 |
|                                                                                   |                                                                                                  | SECTION D                                   |                 |
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## 1.0 Purpose

The purpose of this specification is to describe minimum packing requirements for the different items/equipment for all export Project and also to define marking and shipping requirements during transportation by ship, road and air for all export jobs.

## 2.0 SCOPE

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

The scope this specification is to define VENDOR's responsibilities in terms of:

- Preservation of the GOODS/items/equipments before packing.
- Packing of the GOODS for road, rail, sea and/or air transportation to desired destination i.e. project site
- Making cases/crates
- Chemical Treatment/Fumigation before packing to prevent fungus, damage due to termite, borer, rats, etc.
- Marking of cases/crates.
- Other Services required.

## 3.0 Application

This specification is applicable to all the goods to be transported to project site and requires to be in transit for longer duration. *However, for "Misc cable erection items", "Fire sealing system" & "Exothermic welding material", the packing requirements shall be as per the procurement specification.*

## 4.0 Definitions

- "BHEL" : Main EPC vendor
- "OWNER" : Customer for a particular export project.
- "VENDOR" : Company(ies)/VENDOR(s) to whom the BHEL has placed Purchase Order for GOODS/ items/system/package.
- "GOODS": means all or part of the articles, material, equipment supplies including technical documentation, as described in the Purchase Order, to be supplied by VENDOR.
- "PACKER": Packaging Company to whom VENDOR intends to sub-contract the packing in case they do not have own packing capability/facilities .
- "FREIGHT FORWARDER" : Means the Company responsible for performing freight forwarding activities.

## 5. General Information

|                                                                                   |                                                                                                  |                                             |                 |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------|
|  | <b>TITLE</b><br><br><b>TECHNICAL SPECIFICATION<br/>FOR SEAWORTHY PACKING<br/>FOR EXPORT JOBS</b> | SPECIFICATION NO. <b>PE-TS-888-100-A001</b> |                 |
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The following requirements are intended as minimum requirements, and compliance to these requirements in no way absolves or relieves VENDOR of any responsibility or obligation outlined in the Purchase Order. In all circumstances, the packing will be designed and constructed in order to support GOODS during transportation as well as to prevent the Goods from damage due to impact, extreme climatic conditions, sun and rain. It must be ensured that the delivery of the GOODS to the jobsite by sea, road or air, in good condition.

GOODS shall be export packed in compliance with the best-established practices for international projects, in accordance with the following instructions. In the event of any conflict between these specified requirement and the established practices, specification requirement shall govern.

Due to climatic conditions and the complex transport operation(s), it is essential that protection and packing is of the highest standard. Packing means to efficiently protect the GOODS during the total transport operation; from the moment they leave the factory until they are delivered to the jobsite, including handling operations (loading/unloading) and storage.

When VENDOR do not have packing capabilities/facilities of their own and therefore intends to sub-contract, VENDOR have to inform BHEL/Purchaser of the name and address of proposed PACKER(s) for approval.

#### **6.0 Criteria for Selection of Packaging**

Packages are to be made according to categories, described in articles 8.1 to 8.5, depending on the type of materials, their fragility and size.

These categories have been established for the protection of equipment and material during multi-mode transports, i.e.: combination of overland and sea transport; containerization, air transportation.

In a general manner, the GOODS have to be packed in such a way that crates, bundles, pallets can be stored into General Purpose containers, wherever possible.

If VENDOR has any doubt about the correct method of protection or packing, he should contact BHEL/Purchaser in order to mutually agree on the adequate type of packing to be used.

Materials can be classified in following categories

- Hazardous Material
- Non-Hazardous Material
- 

Further to above categorisation, non-hazardous materials can be sub- categorised for selection of packing.

#### **6.1 Hazardous Materials**

Though handling of hazardous material may is not applicable in the scope of this specification. All hazardous material must be packed in adherence to the detailed requirement relating to packing, marking and labelling set out in the most recent report of the Board's Standard Advisory Committee on the Carriage of Dangerous Goods in Ships for sea freight, and the Restricted Articles Regulations, laid down by the International Air Transport Association for airfreight.

#### **6.2 Non-Hazardous GOODS**

The scope of this specification is to provide necessary guidelines for packing for power plant equipment, components, Pipings & Valves, Fittings, other structural items, electrical items, spare parts and erection materials. The procedure is defined in subsequent paragraphs in details in clause no. 8.0.

|                                                                                   |                                                                                                  |                                             |                 |
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## 7.0 Marking Instructions & Despatch details, Storage Code

### 7.1 Marking Instructions & despatch details

Packages and crates will be marked with indelible black paint, resistant to seawater. Marking must be perfectly legible.

The shipping marks, which will be as per fig-13, shall be stencilled on two sides and one end in clear characters at least 5 centimetres high (where crate size permits, otherwise use optimum size for each package dimension).

When the GOODS are to be shipped in containers then marking may be stencilled on one end only. However, packages must be stowed in a manner that shows these marks.

Crates containing fragile articles must be packed with special precaution against risk of breakage and must be stencilled on all sides "FRAGILE - HANDLE WITH CARE". Where crates are not to be overturned, VENDOR must show on the crates, clear and readily visible identification as per fig-12, to ensure they are kept in the correct position.

Packages/equipment of 2,000 kg or more must be marked with slinging points on all sides, in addition to the centre of gravity marks.

Number packages consecutively i.e. 1 of 10, 2 of 10, etc. Do not duplicate package numbers. VENDOR is responsible for any loss or damage caused by incorrect marking.

All cases/crates shall also be marked with the appropriate international standard graphic symbols for handling as shown in Fig 12.

As a minimum, all cases/crates are to be marked clearly on all four sides with:

- "HANDLE WITH CARE"
- "RIGHT SIDE UP"
- "KEEP DRY"

In the case of packages with a single gross weight totalling 2,000 kg and/or a height of more than 1m, the centre of gravity shall be clearly marked with the symbol on two adjoining sides. For all items of equipment with an eccentric centre of gravity this symbol shall be marked at the bottom, side and top of the package.

The slinging and lashing points shall be marked with a chain symbol.

When packing in cases/crates, these packages shall also have metal corners at the slinging points. (Fig-11)

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

Dispatch details such as consigner/consignee address, contract and case details, country of origin, port of delivery, stacking instructions shall be written on one side of the boxes. An anodized aluminum plate as per details and specifications given in fig-13 shall be provided on one side of the boxes.

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

|                                                                                   |                                                                                                  |                                             |                 |
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## 7.2 Storage Code

The type of storage required is required to be specified, it will be shown on each packaging in **RED colour**.

- X Crates or packages to be stored outdoor without covers
- XX Crates or packages to be stored under tarpaulin
- XXX Crates or packages to be stored in covered or enclosed premises
- XXXX Crates or packages which must be stored in air-conditioned premises

## 8.0 GUIDELINES FOR PACKING GOODS

**8.1** In the subsequent paragraphs details of different types of packings for different types of GOODS are defined. Vendor shall make packing details/procedure based on the guidelines and submit for approval.

### 8.1.1 Packing for Pipe, Fittings, Flanges and Valves, Structural Steel

Particular attention should be brought to pipe, fittings, flanges, valves and structural steel. Packing categories for piping and fittings will differ according to the diameter and wall thickness of these products. VENDOR shall comply with the following established practice.

#### IMPORTANT NOTE:

*Depending on the project schedule and availability of ocean vessels, the piping and structural steel may be shipped in containers. In this event, VENDOR has to arrange the packages in such a way it allows the stuffing into Open Top in gauge containers.*

### 8.1.2 Pipe

Where practicable, pipe lengths shall be limited to 11.8 meters.

All pipes 2" included and below shall be packed in crates. All pipes to be capped and ends sealed with waterproof tape.

Pipes over 2" up to 6", shall be bundled and banded in bundles of uniform length. Bundling is carried out with U-IRON or traversal planks, joined with threaded connecting rods with locknuts. Quantities and strapping positions depend on the lengths, with a 120 cm spacing to prevent distortion. Bundle weight shall not exceed 2,000 kg. All pipes are to be capped and ends sealed with waterproof tape (tape is not necessary if end caps are of the pre-shrunk or self-sealing type).

Pipes larger than 6" shall be shipped as single lengths with the ends capped. End caps are to be of the recessed type to enable the use of soft faced hooks, but still completely sealing the end and also protecting the weld.

All stainless steel piping must be packed separately in wooden crates. Any banding of bundles is to be with the same material.

### 8.1.3 Pipe Fittings, Flanges and Valves

All pipe fittings, flanges and valves up to 6", are to be packed in cases/crates. For items over 6", these may be fixed securely to a pallet base and enclosed in a crate, for protection. Where valves have actuators attached, rigidity must be ensured for the valve and actuator. The vulnerable parts of the actuator are to be completely protected within a wooden crate.

All stainless steel fittings, flanges and valves of all sizes, must be packed separately in wooden crates. Any strapping is to be with the same material.

### 8.1.4 Structural Steel

|                                                                                   |                                                                                                  |                                      |                 |
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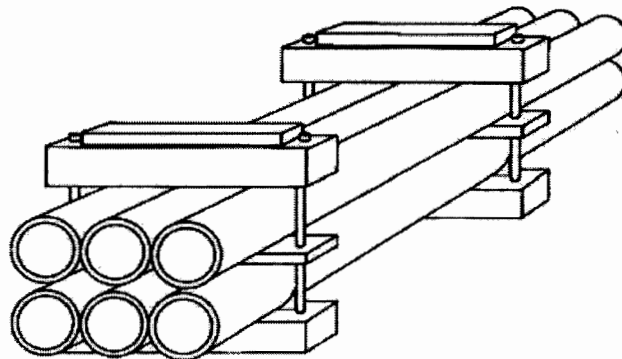
Structural Steel, reinforcing rods, bars, etc., should be packed in bundles of uniform length. Refer to articles 8.1.2, for strapping requirements. Bundle weight not normally to exceed 2,000 kg. Fabricated structures and structural steelwork, etc, should be bundled and packed using wooden beams and long bolting to secure the load.

## 8.2 Bundling – Packing Category I

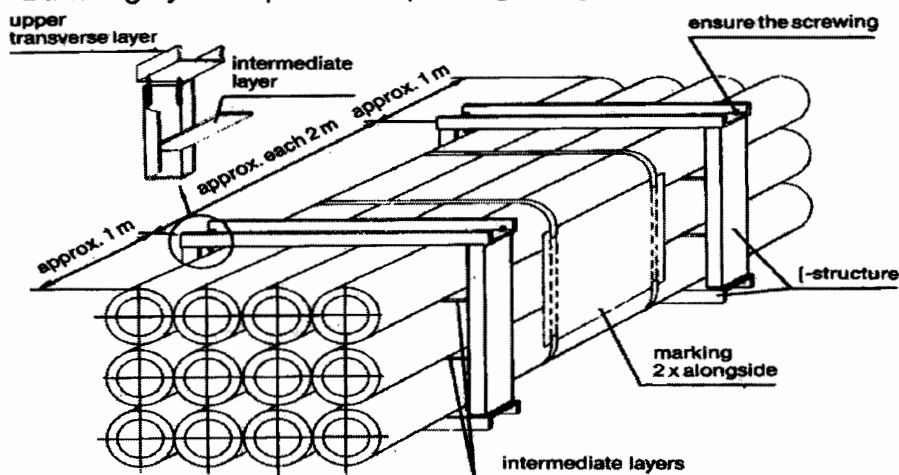
### 8.2.1 Type of Equipment

Equipment which is not subject to damage by corrosion or mechanical effect, i.e. pipes, piping, structural steel.

#### Packing category I



#### Bundling by U-shaped iron – packing category I A



### 8.2.2 Type of Construction

|                                                                                   |                                                                                                  |                                      |                 |
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- Bundling has to be effected
- By squared timber and threaded rods.
- With an intermediate layer (threaded on tightening bolts) according to the weight of the package.
- Wedge-shaped timbers must be added at the outer points of lower layer.
- Between the bolts a spacer must be nailed.
- The bolts must be secured (e.g. by locking nut).
- If single parts could protrude, an appropriate protection must be installed (flat iron or plates).
- Bundling with steel straps or PVC straps is not accepted.

### 8.3 Skids, Square Timber Constructions, Casings – Packing (Category II)

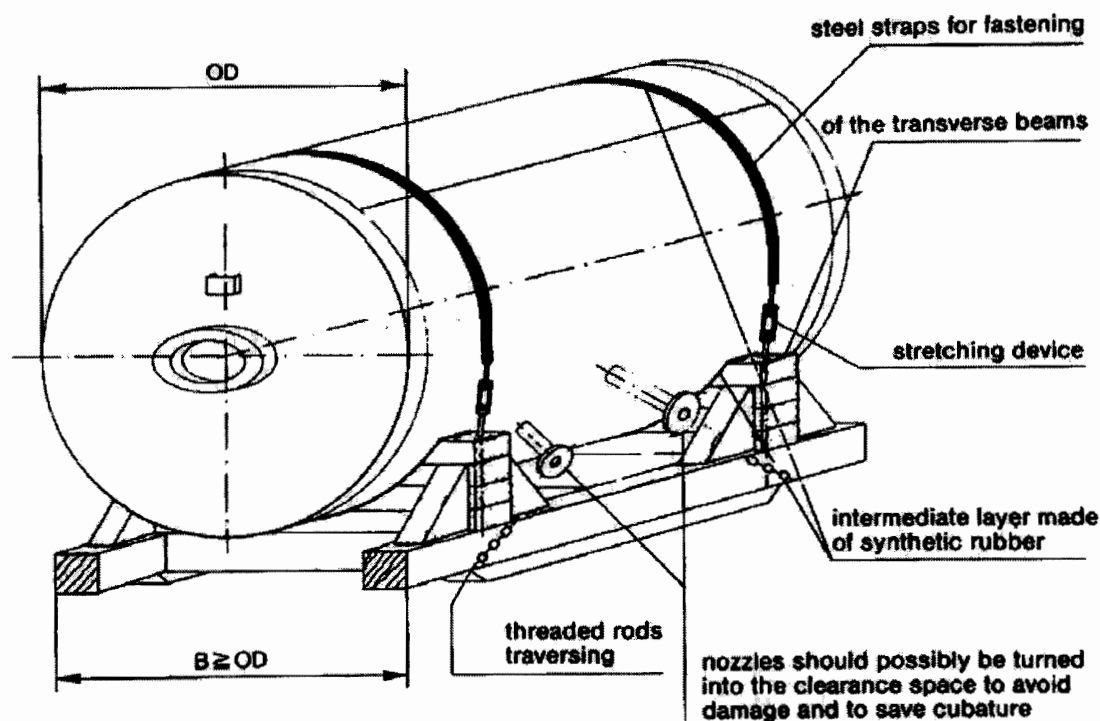
#### 8.3.1 Type of Equipment

Voluminous apparatus, tanks and/or heavy pieces those are not vulnerable to mechanical or corrosive effects.

#### 8.3.2 Type of Construction

- The construction skid can be made of wood or of metal.
- The fastening of the packages on the skid will be made by steel straps (flat iron) which have to be elastically lined, non-slip and securely bolted onto the skids.
- Flange openings have to be closed with gaskets and blind flanges or, if necessary, provided with cover.
- Skid constructions may not be less than the dimensions of the package in length or in width.
- Tanks and apparatus with their own support cradles must be supplied with an anti-slip lining.

### PACKING CATEGORY-II



|                                                                                   |                                                                                                  |                                      |                 |
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#### 8.4 Packing of GOODS in Wooden Crates/Cases/Boxes

*The construction of wooden crate/cases/boxes shall be as per the details indicated in clause 9.0 & Fig 1 to 11. Details indicated in the sketches for different categories Packing crates/boxes are only for a typical equipment considered for illustration.*

##### 8.4.1 Packing Category III

###### 8.4.1.1 Type of Equipment

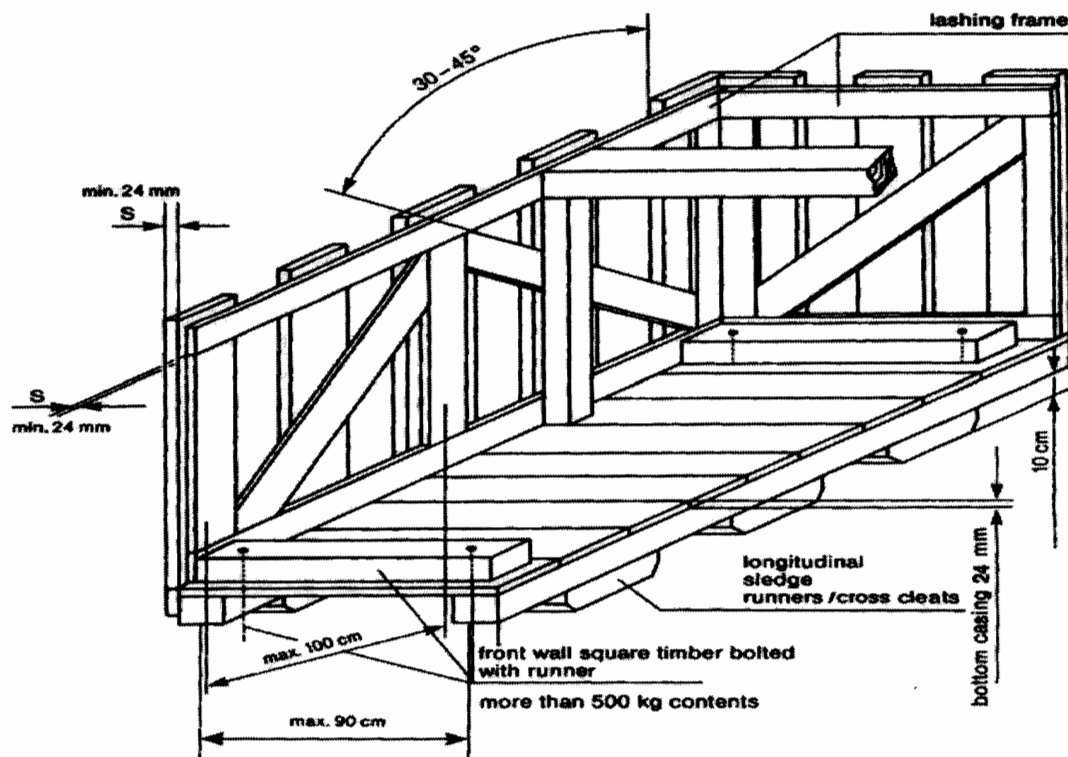
Fabricated equipment, which cannot be transported on cradles; frame-works, prefabricated piping and fittings, mechanical and electrical assemblies. *This type of packing is recommended where many parts of the equipment/component/assembly are not protruding out.*

###### 8.4.1.2 Type of Construction

The equipment must be safely fastened to the bottom with bolts, possibly by the runners or to be spread in such a manner that no protruding parts are possible. For parts, sensitive to rainwater and/or debris, a protection has to be made by a foil cap.

If it is possible that single part could protrude through the front/back side wall, they shall be closed completely. The marking of the package shall be done on plywood plates at the prescribed sides.

##### Packing Category III



|  |                                                                                                  |                                      |                 |
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## 8.4.2 Cases with Lining – Packing Category IV

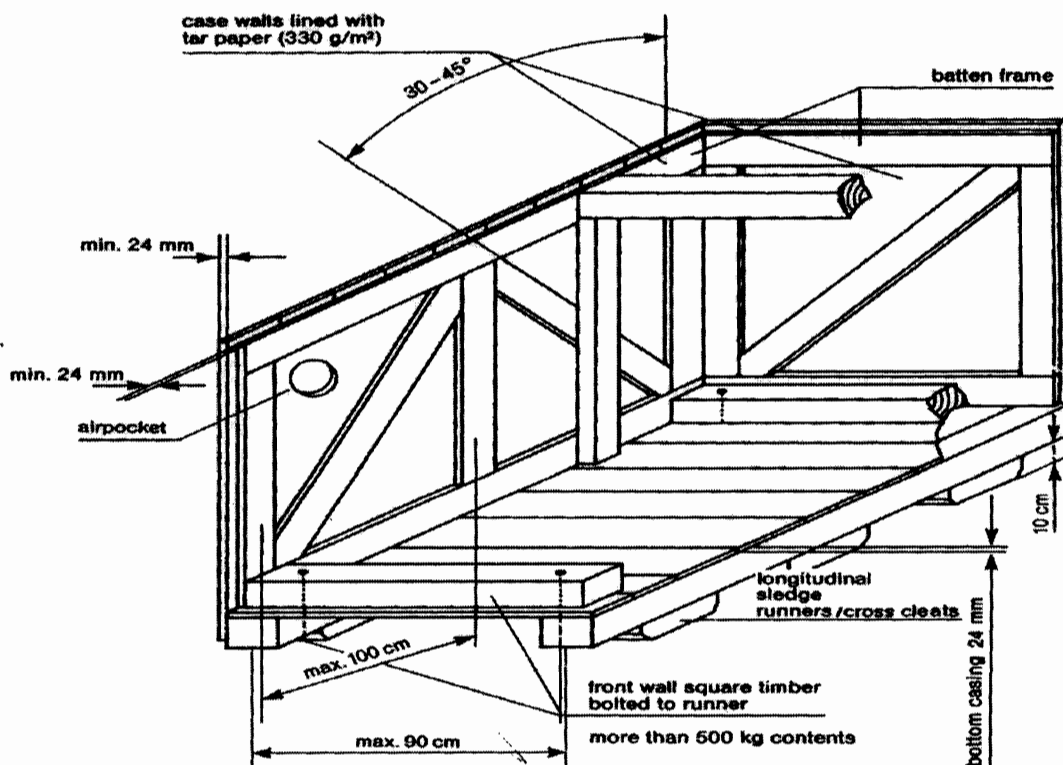
### 8.4.2.1 Type of Equipment

*Recommended for equipment and mechanical parts Equipment sensitive to mechanical damage or parts and components that are particularly at risk of theft or loss; pumps, elbows, flanges, fittings, tools, erection materials, etc.*

### 8.4.2.2 Type of Construction

The same type of construction as article 8.4.1.2, but with all sides completely boarded without space between the boards. Sides to be provided with waterproof lining; fabric-reinforced waterproof tar paper or polyethylene-foils resistant to ultraviolet rays can be used. Polyethylene-foil shall be fixed under the lid cover to avoid penetration of water. At weights of more than 500 kg the longitudinal runner must be bolted to the front all square timber. For ventilation inside the case, an opening in the waterproof lining must be placed between the diagonal battens and diagonal joists.

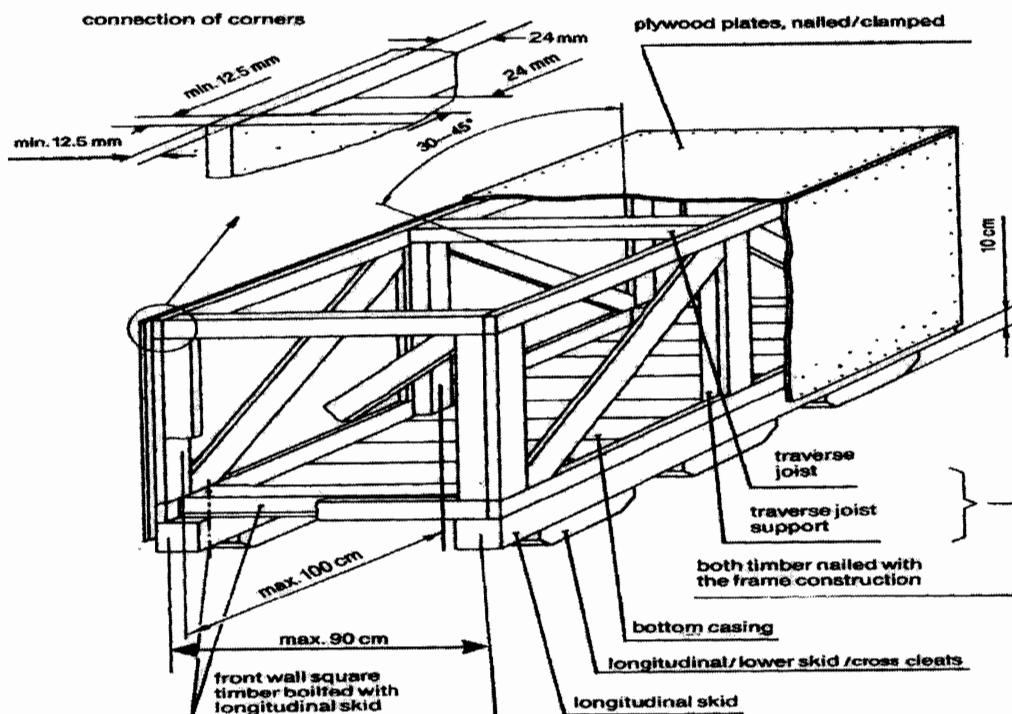
### Packing Category IV



## 8.4.3 Cases with Alternative Surface Materials

### 8.4.3.1 Plywood Box – Packing Category IV A

|  |                                                                                                  |                                      |                 |
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Case constructed of 5 layers of watertight, glued plywood with a total thickness of 12.5 mm. The frame must be constructed from minimum 24 mm timber or as per guide lines given above against clause 8.0, Fig 1 to 11 and must be suitable for the weight and nature of the parts to be packed. Planed square timber must be bolted with longitudinal skid and covered with diagonal joists. If applicable, construction of the cover and sides is to include diagonal bracing. Covers consisting of several layers of plywood are to be sealed with durable elastic putty or additional water-resistant sheets to be fixed.

#### **8.4.4 Case with Barrier Material – Polyethylene Foil – Packing Category V**

##### **8.4.4.1 Type of Equipment**

Sensitive equipment, simple electrical equipment, insulation materials, fire-resistant materials, with non-corrosion- guarantee for a period up to twelve (12) months.

##### **8.4.4.2 Type of Construction**

Preservation by welding in polyethylene-foil with addition of desiccants and if necessary, application of non-corrosive contact agents, otherwise, type of construction as indicated in article 8.4.2.2.

Additional marking:

- Case with desiccants.

#### **8.4.5 Case with Barrier Material – Aluminium Compound Foil – Packing Category VI**

##### **8.4.5.1 Type of Equipment**

|                                                                                   |                                                                                                  |                                      |                 |
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Electrical equipment such as, switchboards, electric motors, sensitive equipment, with non-corrosion guarantee, for a period up to twelve (12) months.

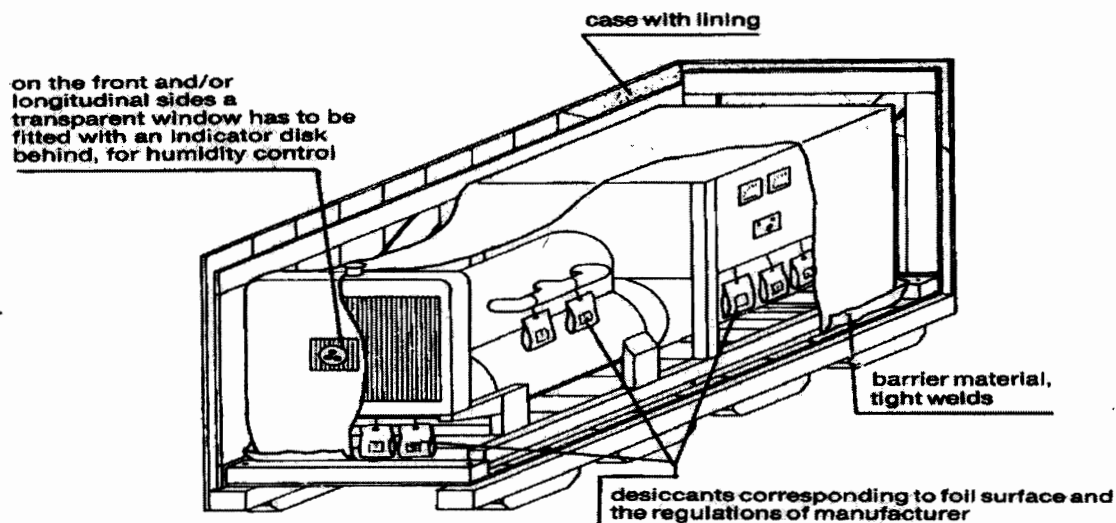
#### 8.4.5.2 Type of Construction

Type of construction as indicated in article 8.4.2.2. Preservation by sealing an aluminium compound foil, with the addition of desiccants. Humidity indicators, if required and installed in the barrier wrapping, shall allow easy control from the outside.

Additional marking:

- Case with desiccants.

#### Packing Category V/VI



#### 8.4.6 Double Case – Packing Category VII

##### 8.4.6.1 Type of Equipment

GOODS which are of high sensitivity to shock, impact and vibration, for instance, special electrical equipment like computers, switchboards, laboratory instruments

##### 8.4.6.2 Type of Construction

Case construction as indicated in article 8.4.2.2, with additional floating inner packing (case-in-case principle), padding corresponding to weight and sensitiveness. Preservation by sealing in aluminium compound foil with the addition of desiccants. The inner case has to be made of plywood or equivalent material with a thickness of 8-12 mm, depending on the weight of the GOODS to be packed. The inner buckles and/or frame borders have to be dimensioned so that the full stability of the inside case will be reached and no twisting is possible. The inner sides of the inside case will be lined with bituminous kraft paper on all sides (except bottom).

|                                                                                   |                                                                                                  |                                      |                 |
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#### **8.4.7 Cable Drum – Packing Category VIII**

##### **8.4.7.1 Type of Equipment**

All type of cables, wires, ropes, hoses.

##### **8.4.7.2 Type of Construction**

For all type of cables refer clause no. 11.1. For other items (wires, ropes, hoses) new or practically new drums are to be used. Planking of the e drums by use of boards, thickness minimum 20 mm, with additional double steel strapping, nailed, and carefully preserved/protected cable ends prior to packing.

#### **8.4.8 Hazardous Materials – Packing Category IX**

##### **8.4.8.1 Type of Equipment**

Hazardous materials according to the law are explosives, compressed gases, liquefied gases dissolved under pressure or deeply refrigerated, flammable liquids, flammable solids: substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases, oxidizing substances, organic peroxides, poisonous (toxic) and infectious substances; radioactive materials, corrosives, miscellaneous dangerous goods.

##### **8.4.8.2 Type of Construction**

Hazardous materials shall always be packed and documented separately from any other material. Selection of packaging materials, execution of packing and marking as well as documentation shall always be in compliance with the applicable laws and regulations. Any certificates required for transportation or for authorities to be supplied before shipment of the GOODS.

#### **8.4.9 Wooden Floor as a Transport Support – Packing Category X**

##### **8.4.9.1 Type of Equipment**

Any materials to be stuffed in containers or on flat racks and that are not stowed on standard pallets or otherwise suitably packed

##### **8.4.9.2 Type of Construction**

- Longitudinal internal square timbers bolted to the front wall runners, longitudinal skid.
- Maximum distance between longitudinal runners 90 cm (middle to middle of the runner).
- Full boarding of the floor.
- Attaching of lifting lugs and/or iron ropes for lifting/pulling the units off the transport equipment.
- If applicable, preservation of the equipment by sealing in polyethylene-foil or aluminium compound foil and the addition of desiccants.

#### **8.5 Air Transport Packing**

##### **8.5.1 General**

Certain types of material may have to be shipped by air from their country of origin. This means of transport will be exceptional, and will be used only:

- For GOODS, which are highly sensitive to shock or vibrations, such as computers, electronic instruments, or those of small dimensions and weight.
- For GOODS urgently required at the module yard(s) and/or jobsite.

|                                                                                   |                                                                                                  |                                             |                 |    |
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### 8.5.2 Type of Packing

Depending on the goods to be packed, VENDOR may use one of the following types:

- A triple-corrugated cardboard container made with waterproofed glue and a barrier layer of polyethylene on the outsides to keep out humidity.
- Wooden/cardboard packing cases: the wood being used for the framework and base of the cases, waterproofed triple-corrugated cardboard being used for the sides and top. These cases are of the "Bell" type, and used for material of small or medium dimensions.
- For larger dimensions, plywood cases are acceptable. The timber characteristics, cross-sections and thickness will be systematically determined by the nature of the loads to be packed.

### 8.5.3 Dimensions

In order to optimize the existing transport facilities (passenger or cargo aircraft), the dimensions of:

- Triple-corrugated containers.
  - Wooden/cardboard packing cases.
  - Plywood cases.
- Are to be adapted to pallets used for air transportation.

## 9.0 Detailed specification for Wooden Crates/Boxes/Cases and other packing materials

### 9.1 Technical specification for wood

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

### 9.2 Chemical Treatment of Wood:

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

### 9.3 TYPE, DESIGN & DIMENSION OF WOODEN PACKING CASES:

#### 9.3.1 PACKING OF EQUIPMENTS

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

##### 9.3.1.1 Bottom Frame

|                                                                                   |                                                                                                  |                                      |                 |
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The construction of bottom frame shall be as per Fig-2. The No. of slides/runners for bottom frames shall be selected depending upon the weight and overall dimensions of the load to be carried. The equipment shall be secured by fixing their base frame/plate with the help of bolt and nuts etc. to bottom frame of the wooden packing cases/crates. The equipment not provided with base frame/plate like cylindrical vessels, etc to be secured to the bottom frame of the wooden cases with "C" clamps fabricated from steel channels/ angle iron.

#### 9.3.1.2 TOP FRAME

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

#### 9.3.1.3 END PANELS

The dimension of the end and lateral panels shall be calculated according to overall dimensions of the items to be packed. Diagonal braces shall be used for packing cases having height exceeding 500mm. Details of bracings shall be as per fig 5 to 9.

#### 9.3.1.4 Sling Plate

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

#### 9.3.1.5 Angle Iron Cleats

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

#### 9.3.1.6 Other Requirements

- The thickness of planks for top, bottom, side and end panels shall be at least 25mm. Planks used for this purpose shall be joined with each other by tongue and groove joint. The groove dimension shall be such that tongue fits tightly into groove to make the joint.
- Runners/slides, traverse bars, etc shall be of single length i.e. without any joint. Planks for sheathing, diagonal bracing etc shall also be of single length up to 2400mm, proper jointing is permitted for planks for sheathing and diagonal bracings.
- Each equipment to be individually covered with double polyethylene petticoat. Sheet thickness of polythene sheet shall not be less than 0.175 mm (175 microns). The sealing shall be such so as not to allow moisture inside.
- The inner surface of 4 sides of shooks shall be nailed with bituminized water proof craft paper. Wherever 2 pieces of kraft paper are used, joint shall have an overlap of minimum 20 mm.
- All the inner sides of the box shall be nailed with bitumen coated HESSIAN POLYTHYLENE KRAFT PAPER. For top frame it shall project on all sides by 100mm and shall be nailed on sides. Wherever 2 pieces of kraft paper are used, joint shall have an overlap of minimum 20 mm.
- For delicate equipment like control panels and switchgears, lighting panels and lighting transformers, suitable cushioning material like rubberised coir (min. 50 mm thick and 100 mm wide) shall be provided on their bottom support and the gap between the panel and casing

|                                                                                   |                                                                                                  |                                             |                 |
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shall be filled with rubberized coir with distance between consecutive supports less than 500 mm (ref fig15). For other equipment suitable support from sides of the casing shall be provided.

- Switchgear cubicles, control panels and control desks shall be packed and shipped in separate convenient sections. The components e.g. circuit breakers relays and instruments etc. which are removed from panels for shipping purpose and shall be separately packed and shipped as per packing instructions in clause 10.4.
- Packing case for control panels and switchgear panels shall be finally covered with GI sheet of minimum thickness of 0.4mm.
- Packing cases shall be bound at edges by nailing MS clamps/brackets at sufficient intervals. Further heavier boxes shall be strapped with C clamps (ref fig-4) fabricated from steel channels/angles and lighter boxes shall be strapped with hoop iron strips.
- Silica gel is used for this purpose to protect contents over sufficiently long time from corrosion. Silica gel shall be indicating type confirming to IS-304 (1979) packed in cotton bags placed at different positions inside the packing for absorbing moisture and shall not come into directly contact with equipment/material inside the package. The quantity of silica gel shall be adequate for storage period of one year, however it shall not be less than 4 gm. per ltr. Volume of case subject to minimum 400 gm. Per case.



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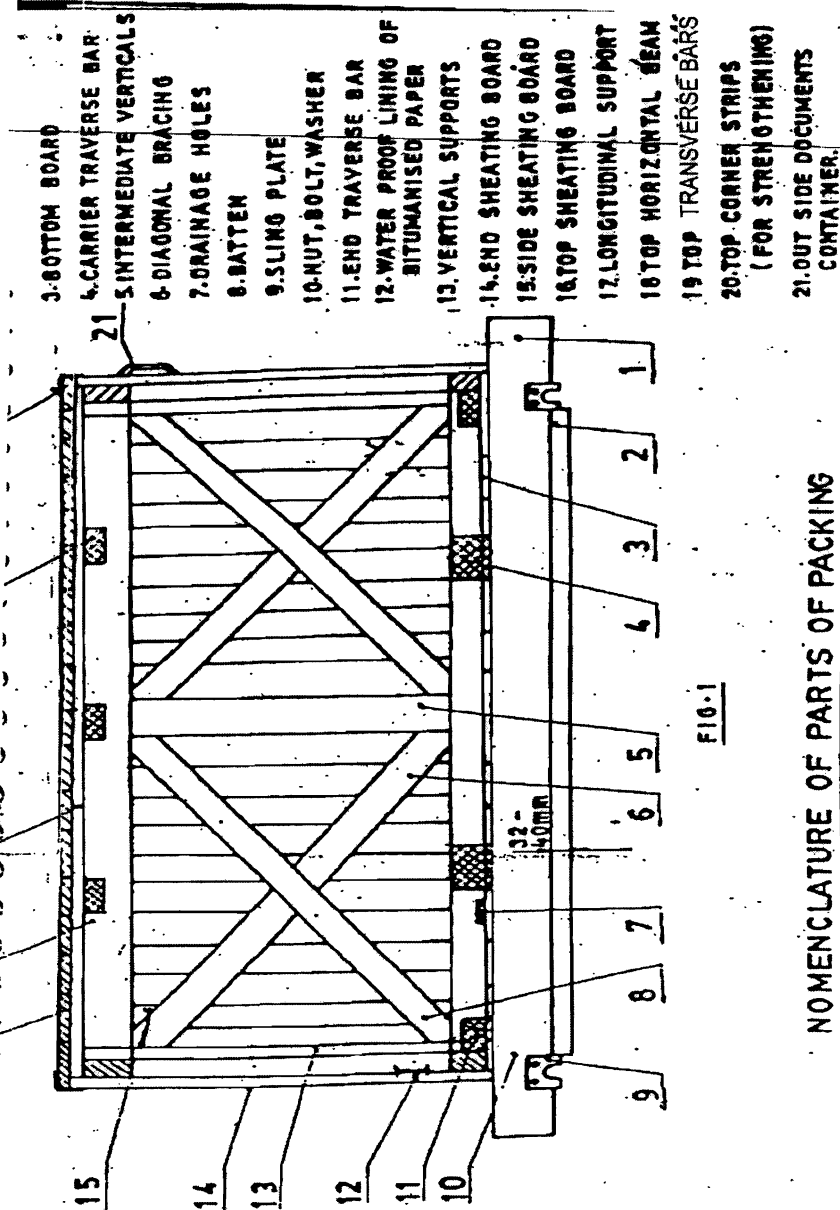


FIG-1

## NOMENCLATURE OF PARTS OF PACKING

### CASES

FIG-1

1 SLIDE  
2 UNDER SLIDE BOARD

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## BOTTOM FRAME ARRANGEMENTS

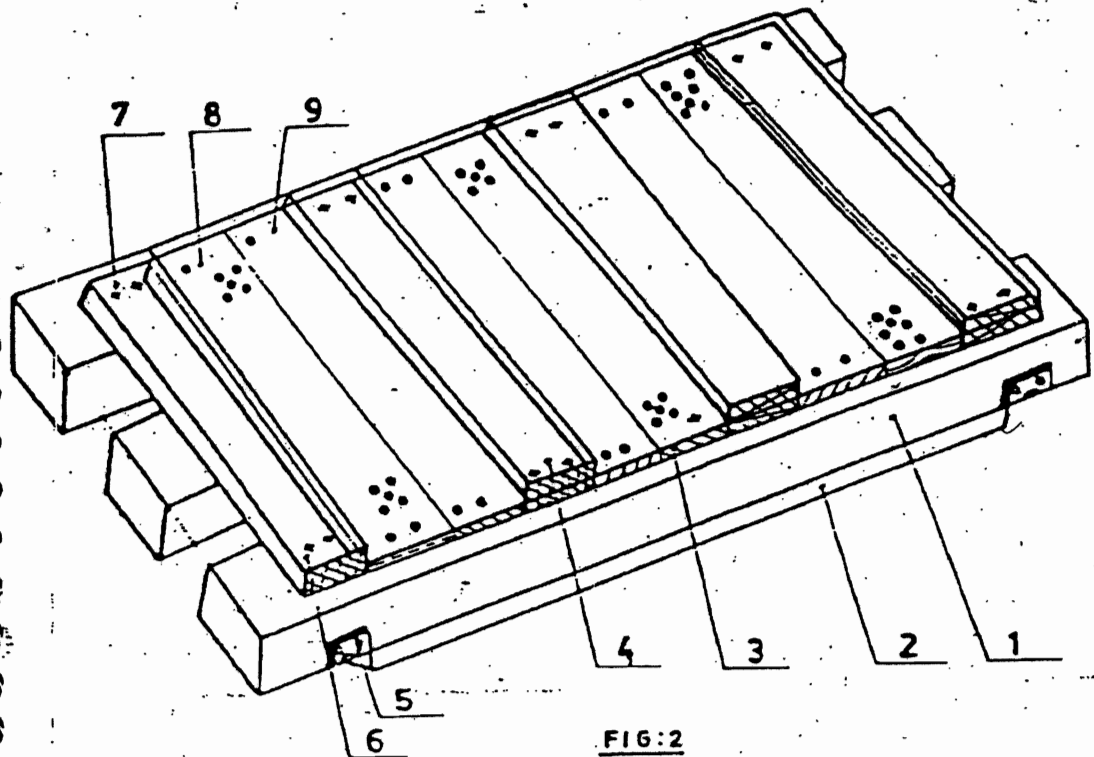


FIG:2

Nos. of slides: Minimum 2 Nos.  
For length more than 1800 mm or  
load more than 1000kg, Nos. of  
slides shall be minimum 3 Nos.  
For dimensions of slides, refer Table 1  
Cross section of end traverse bar; 100x100 mm.  
(minimum)

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

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## TOP FRAME ARRANGEMENT

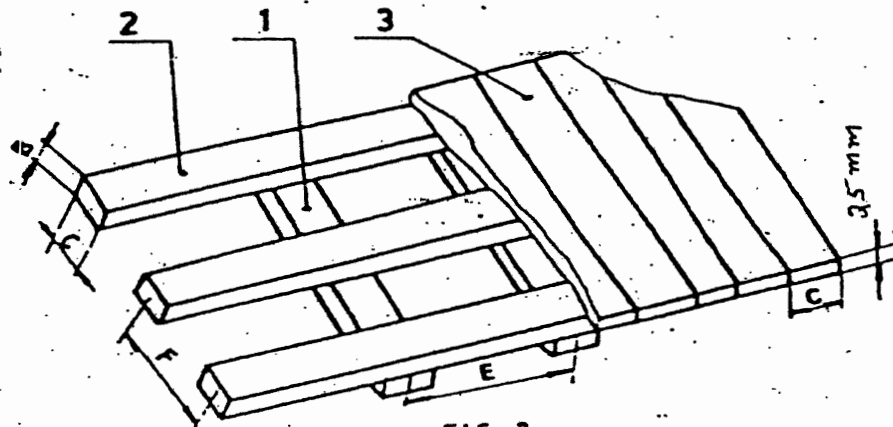
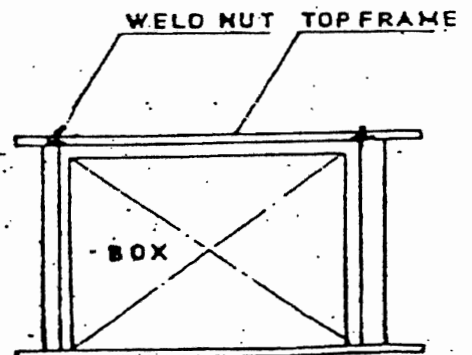
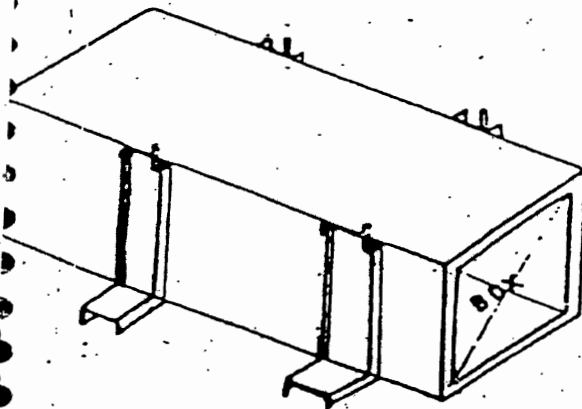


FIG-3

F : 700 to 1000 mm  
E : 500 to 900 mm  
30x100 mm.

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

## ARRANGEMENT OF C-CLAMPS AROUND CASES



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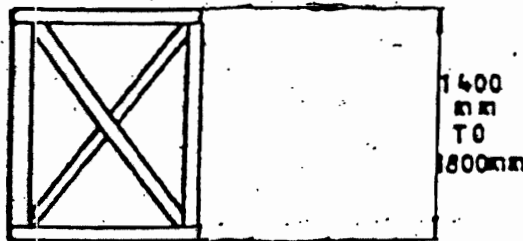
**ARRANGEMENT OF DIAGONAL BRACING AND  
HORIZONTAL SUPPORT**

FIG: 6

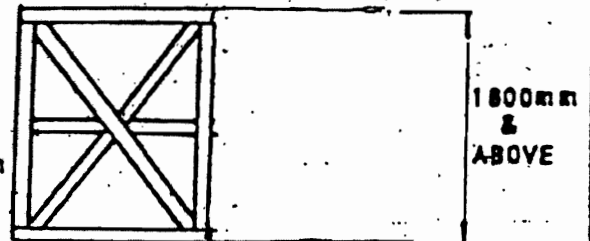


FIG: 8

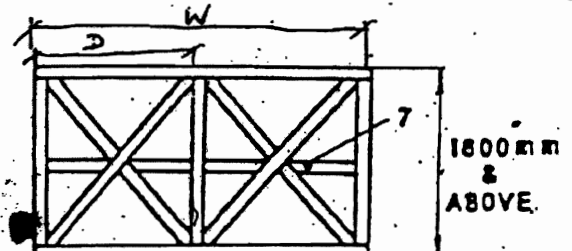


FIG: 7

7- Middle Horizontal Support

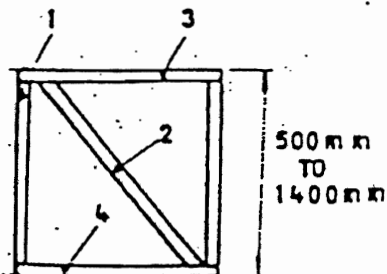


FIG: 5

1- Vertical Support

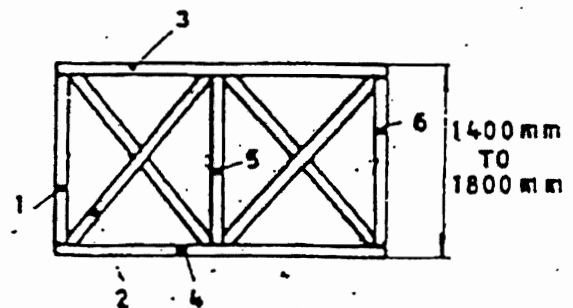


FIG: 7

1, 5, 6 - Vertical Support

**TITLE**

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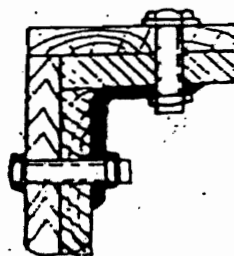
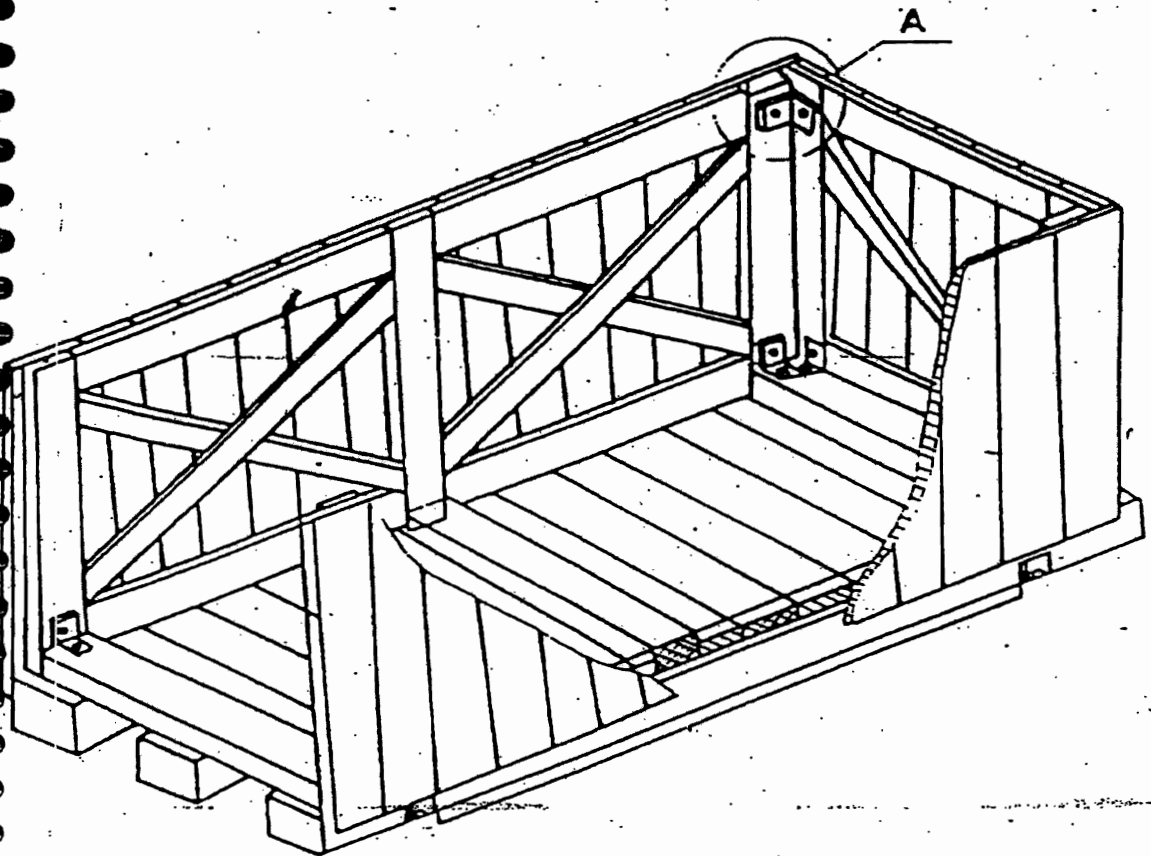
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## ARRANGEMENT OF PACKING CASE



DETAIL-A

**HOLE DIAMETER  
MUST CONFORM  
TO BOLT DIA**

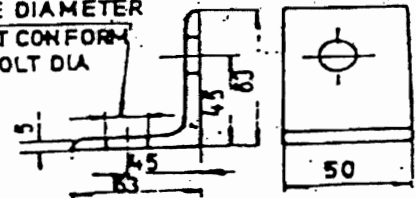


FIG:10

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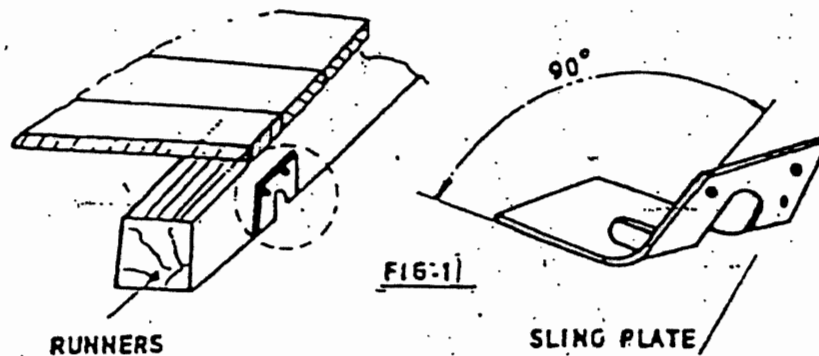
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**ARRANGEMENT OF SLING & PLATE ON  
CASES**

|                                                                                   |                                                                                                  |                                             |                 |
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**TABLE-1**

| LOADS | LENGTHS OF SLIDES      |                 |                 |                 |                                                                                                                               |                 |                 |
|-------|------------------------|-----------------|-----------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|
|       | 600                    | 800             | 1000            | 1200            | 1300                                                                                                                          | 1500            | 2000            |
|       | Cross section<br>b x c |                 |                 |                 | <div style="border: 1px solid black; display: inline-block; width: 80px; height: 15px; vertical-align: middle;"></div> c<br>b |                 |                 |
| 500   | 50<br>X<br>100         | 50<br>X<br>100  | 50<br>X<br>100  | 50<br>X<br>100  | 75<br>X<br>100                                                                                                                | 75<br>X<br>100  | 100<br>X<br>100 |
| 800   | 50<br>X<br>100         | 50<br>X<br>100  | 75<br>X<br>100  | 75<br>X<br>100  | 75<br>X<br>100                                                                                                                | 75<br>X<br>100  | 100<br>X<br>100 |
| 1000  | 75<br>X<br>100         | 75<br>X<br>100  | 75<br>X<br>100  | 100<br>X<br>100 | 100<br>X<br>100                                                                                                               | 100<br>X<br>110 | 100<br>X<br>150 |
| 1500  | 75<br>X<br>100         | 75<br>X<br>100  | 100<br>X<br>100 | 100<br>X<br>100 | 100<br>X<br>100                                                                                                               | 100<br>X<br>150 | 100<br>X<br>150 |
| 2000  | 75<br>X<br>100         | 100<br>X<br>100 | 100<br>X<br>100 | 100<br>X<br>150 | 100<br>X<br>150                                                                                                               | 100<br>X<br>150 | 150<br>X<br>150 |
| 2500  | 75<br>X<br>100         | 100<br>X<br>100 | 100<br>X<br>150 | 100<br>X<br>150 | 100<br>X<br>150                                                                                                               | 150<br>X<br>150 | 150<br>X<br>150 |
| 3000  | 100<br>X<br>100        | 100<br>X<br>150 | 150<br>X<br>150 | 150<br>X<br>150 | 150<br>X<br>150                                                                                                               | 150<br>X<br>150 | 150<br>X<br>150 |

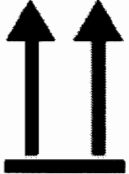
|                                                                                   |                                                                                                  |                                      |                 |
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**Table-2**

| End and side panels | Width of the panel "W" | Distance between longitudinal support (Dimension "D") |     |      |      |             |      |      |
|---------------------|------------------------|-------------------------------------------------------|-----|------|------|-------------|------|------|
|                     |                        | 600                                                   | 800 | 1000 | 1200 | 1400        | 1600 | 1800 |
|                     |                        | Cross section<br>b x c                                |     |      |      | Item 1 to 7 |      |      |
| Fig- 5 to Fig-9     | 600 to 1200            | 30                                                    | 30  | 30   | 30   | 30          | 30   | 30   |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     | 1201 to 1600           | 100                                                   | 100 | 100  | 130  | 130         | 130  | 130  |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     | 1601 to 2000           | 130                                                   | 130 | 130  | 130  | 130         | 130  | 130  |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     | 2001 to 3000           | 130                                                   | 130 | 130  | 130  | 130         | 130  | 130  |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     | 3001 to 4000           | 130                                                   | 130 | 130  | 130  | 130         | 130  | 150  |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     |                        | 150                                                   | 150 | 150  | 150  | 150         | 150  | 150  |

|                                                                                   |                                                                                                  |                                             |                 |
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#### INDICATION MARKS ON CASES/BOXES/CRATES

| Designation                               | Symbol                                                                              | Explanation                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fragile, Handle with care                 |    | The symbol should be applied to easily broken cargoes. Cargoes marked with this symbol should be handled carefully and should never be tipped over or slung.                                                                                                                                                               |
| Use no hooks                              |    | Any other kind of point load should also be avoided with cargoes marked with this symbol. The symbol does not automatically prohibit the use of the plate hooks used for handling bagged cargo.                                                                                                                            |
| Top                                       |   | The package must always be transported, handled and stored in such a way that the arrows always point upwards. Rolling, swinging, severe tipping or tumbling or other such handling must be avoided.                                                                                                                       |
| Keep away from heat (solar radiation)     |  | Compliance with the symbol is best achieved if the cargo is kept under the coolest possible conditions. In any event, it must be kept away from additional sources of heat. It may be appropriate to enquire whether prevailing or anticipated temperatures may be harmful.                                                |
| Protect from heat and radioactive sources |  | Stowage as for the preceding symbol. The cargo must additionally be protected from radioactivity.                                                                                                                                                                                                                          |
| Sling here                                |  | The symbol indicates merely where the cargo should be slung, but not the method of lifting. If the symbols are applied equidistant from the middle or center of gravity, the package will hang level if the slings are of identical length. If this is not the case, the slinging equipment must be shortened on one side. |
| Keep dry                                  |  | Cargo bearing this symbol must be protected from excessive humidity and must accordingly be stored under cover. If particularly large or bulky packages cannot be stored in warehouses or sheds, they must be carefully covered with tarpaulins.                                                                           |

|  |                                                                                                  |                                             |                 |
|--|--------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------|
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|                                |  |                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Center of gravity              |  | This symbol is intended to provide a clear indication of the position of the center of gravity. To be meaningful, this symbol should only be used where the center of gravity is not central. The meaning is unambiguous if the symbol is applied onto two upright surfaces at right angles to each other.                            |
| No hand truck here             |  | The absence of this symbol on packages amounts to permission to use a hand truck on them.                                                                                                                                                                                                                                             |
| Stacking limitation            |  | The maximum stacking load must be stated as "... kg max.". Since such marking is sensible only on packages with little loading capacity, cargo bearing this symbol should be stowed in the uppermost layer.                                                                                                                           |
| Clamp here                     |  | Stating that the package may be clamped at the indicated point is logically equivalent to a prohibition of clamping anywhere else.                                                                                                                                                                                                    |
| Temperature limitations        |  | According to regulations, the symbol should either be provided with the suffix "...°C" for a specific temperature or, in the case of a temperature range, with an upper ("...°C max.") and lower ("...°C min.") temperature limit. The corresponding temperatures or temperature limits should also be noted on the consignment note. |
| Do not use forklift truck here |  | This symbol should only be applied to the sides where the forklift truck cannot be used. Absence of the symbol on other sides of the package amounts to permission to use forklift trucks on these sides.                                                                                                                             |
| Electrostatic sensitive device |  | Contact with packages bearing this symbol should be avoided at low levels of relative humidity, especially if insulating footwear is being worn or the ground/floor is nonconductive. Low levels of relative humidity must in particular be expected on hot, dry summer days and very cold winter days.                               |

|                                                                                   |                                                                                                  |                                             |                        |
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|                        |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Do not destroy barrier |  | A barrier layer which is (virtually) impermeable to water vapor and contains desiccants for corrosion protection is located beneath the outer packaging. This protection will be ineffective if the barrier layer is damaged. Since the symbol has not yet been approved by the ISO, puncturing of the outer shell must in particular be avoided for any packages bearing the words "Packed with desiccants". |
| Tear off here          |  | This symbol is intended only for the receiver.                                                                                                                                                                                                                                                                                                                                                                |

**FIG-12**

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|                             |                                                            |
|-----------------------------|------------------------------------------------------------|
| BHEL-PEM-DELHI-INDIA        |                                                            |
| CONSIGNEE                   |                                                            |
| MATERIAL                    |                                                            |
| CUSTOMER REF.               | MO. NO.                                                    |
| DESPATCH<br>ADVICE NOTE 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 |

FIG-13: MARKING PLATE



# TITLE

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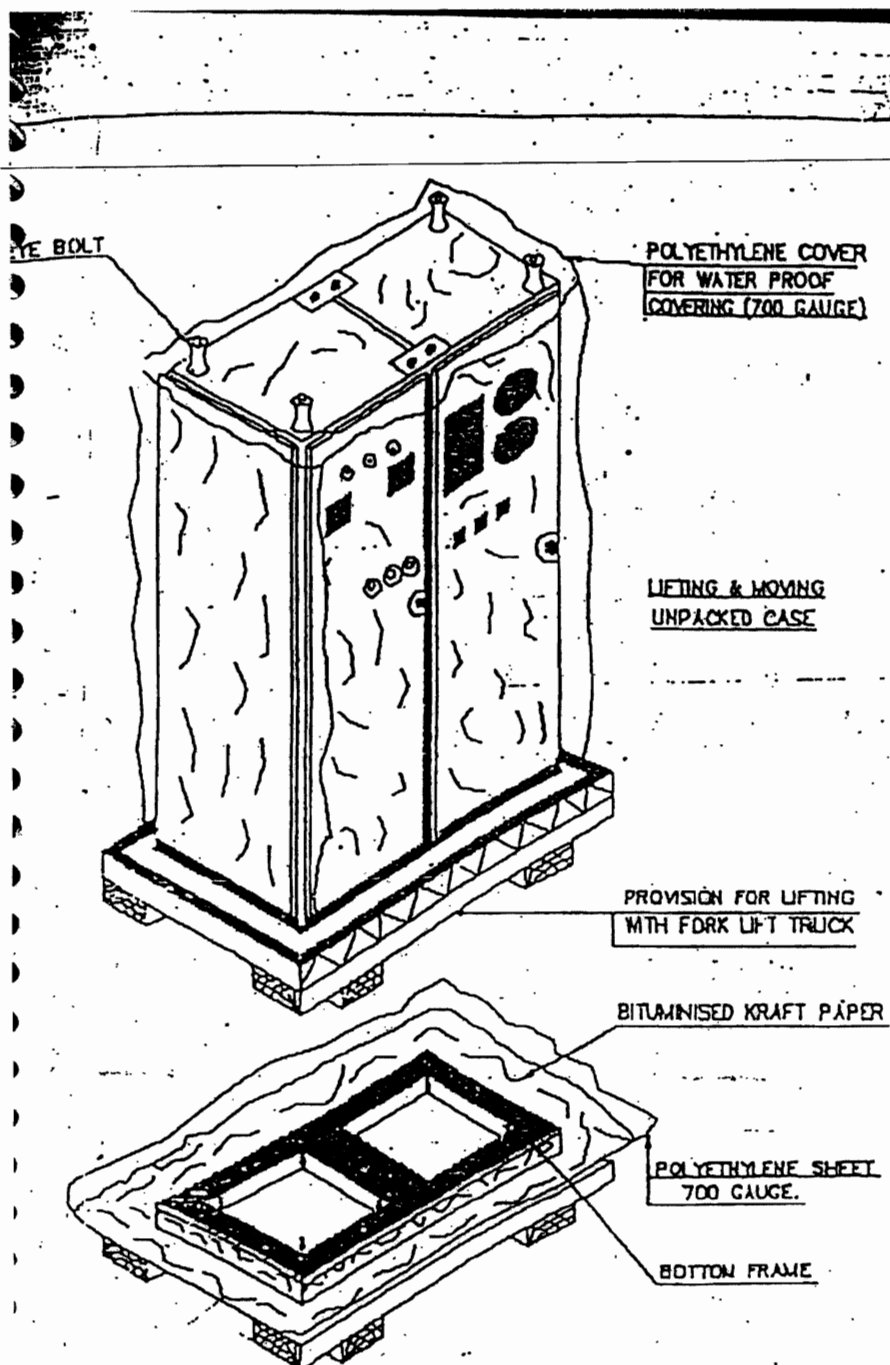


FIGURE-14



# TITLE

## TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

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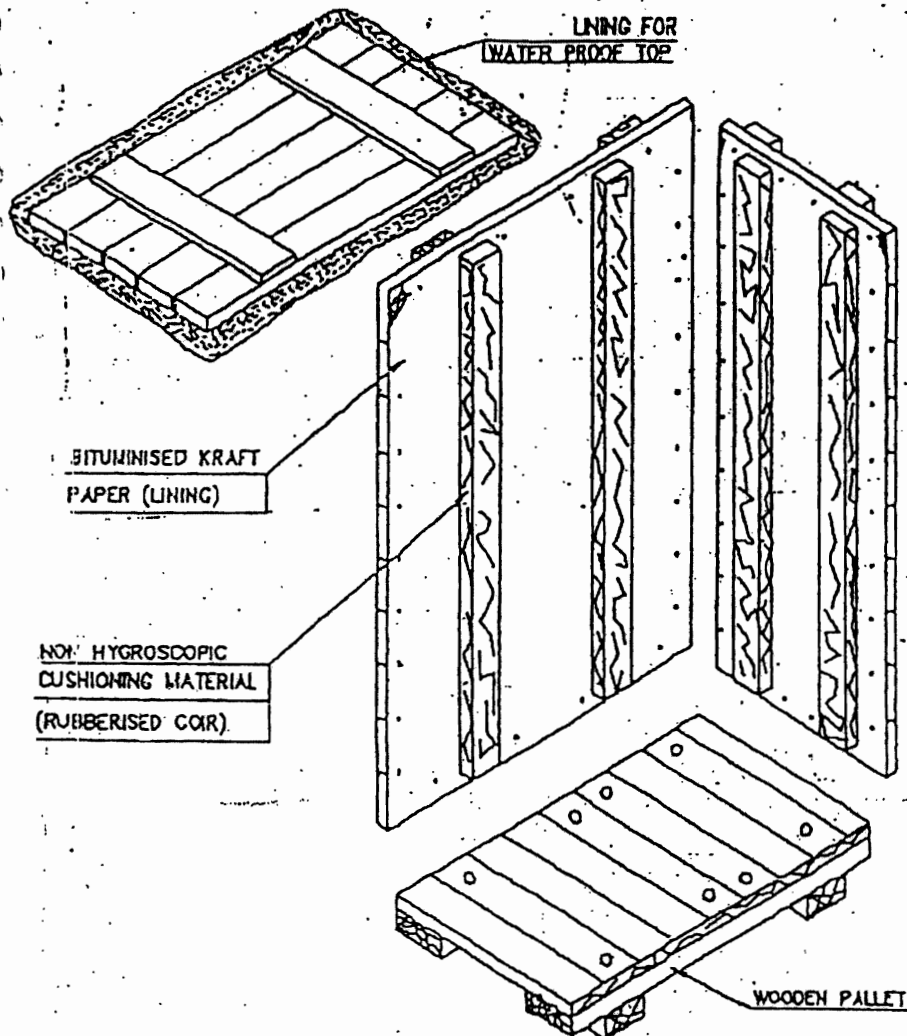
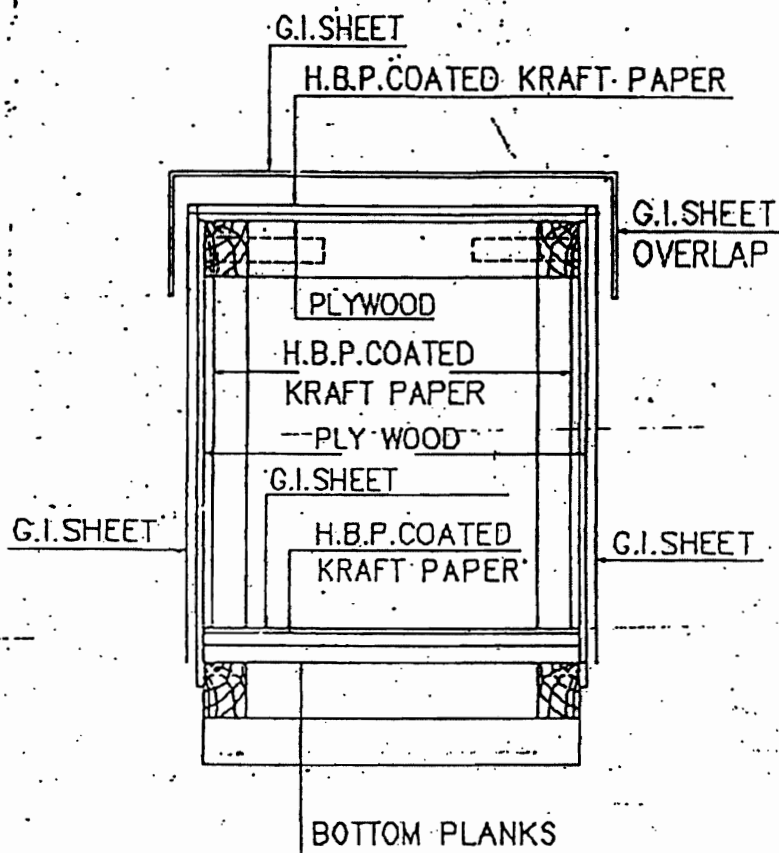


FIGURE-15

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

|                                                                                   |                                                                                                  |                                             |                 |
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## 10.0 TYPICAL PACKING DETAILS/PROCEDURE FOR MECHANICAL ITEMS

### 10.1 INSULATION MATERIAL (MINERAL WOOL MATTRESSES)

This specification covers the requirements of seaworthy packing and marking for bonded mineral (rock) wool mattresses having metallic hexagonal wire netting as facing on one or both sides.

#### 10.1.1 TYPE OF CONSTRUCTION

Mattress shall be packed in Polythene (of 0.2 mm thickness) all around and sealed to prevent moisture absorption during transit and storage. Further it shall be wrapped with Bitumen coated Polythene bonded/lined Hessian and stitched and then packed in 5 ply DFC carton box.

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

Each mattress as well as the packages shall be serial numbered. Also, printed sheets indicating the nominal thickness, density and wire netting details (i.e. material and size) shall be placed below the wire netting.

Following details shall be legibly written on the packages. The details shall also be typed on a sheet of paper & kept in a sealed Polythene cover, inside the packages

- a) Project Name
- b) Purchase Order No.
- c) Sl. No. of package
- d) Size of mattress (Thickness x Length x Width)
- e) Density
- f) Wire netting material and size
- g) Weight of the package

### 10.2 INSULATION MATERIAL (ALUMINIUM COIL)

Heavy Gauge Aluminium Coil Packaging are done by Eye-to-Sky packaging or by Eye to eye packaging as per the proven practice being followed by manufacturer of Aluminium sheets.

#### 10.2.1 Type of construction for Eye to Sky packaging

- a. Strapping of coil with polyester strap around circumference at one place.
- b. Putting paper I. D. Edge protector.
- c. Wrapping the coil with VCI stretch film after putting silica gel bags (4 nos.) Inside the coil.
- d. Wrapping the coil with HDPE film.
- e. Covering the coil including its build up & bore with masonite / particle board.
- f. Putting metallic I. D on coil.
- g. Putting O.D edge protector (paper) on coil.

|                                                                                   |                                                                                                  |                                             |                 |
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- h. Putting circumferential polyester strap (3 nos.) & eye polyester strap ( 4 nos.).
- i. After placing the coil on coil tilter ply wood (10mm thick) of suitable size along with wooden pallet is to be put at the bottom side of the coil.
- j. Coil is to be tilted to eye-to-sky position.
- k. Final strapping with metallic strap to unit coil and skid at 2 places with top cover of plywood.
- l. Fixing the coil with wooden blocks at 4 corners.
- m. Labeling 2 nos.(one metallic & one adhesivetype) For specification, net wt. & gross wt.

#### **10.2.2 Type of construction for Eye to Eye packaging**

- a. Strapping of coil with polyester strap around circumference at one place.
  - b. Putting paper I. D. Edge protector.
  - c. Wrapping the coil with VCI stretch film after putting silica gel bags (4 nos.) Inside the coil.
  - d. Wrapping the coil with HDPE film.
  - e. Covering the coil including its build up & bore with masonite / particle board.
  - f. Putting metallic I. D on coil.
  - g. Putting O.D edge protector (paper) on coil.
  - h. Putting circumferential polyester strap (3 nos.) & eye polyester strap ( 4 nos.).
  - i. Placing of coil on wooden skid Coil is to be tilted to eye-to-sky position.
  - j. Final strapping of coil and skid at 2 places with steel strap. Fixing the coil with wooden blocks at 4 corners.
- Labeling 2 nos.(one metallic & one adhesive type) For specification net wt. & gross wt.

#### **10.3 Packing Procedure for Online Tube Cleaning System and accessories**

This procedure is applicable for the shipment of Onload Tube Cleaning System and accessories by sea.

##### **10.3.1 Packing details:**

- The Packing case shall be made of treated rubber wood. The design of the case shall be as per Annexure IIIA & IIIB.
- The Equipments shall be placed on the wooden base of the Packing case and fastened if required to arrest the movement of the same.
- Equipment shall be covered by Polythene sheet and inside wall surfaces of the wooden cases also shall be covered by polythene sheet.
- All Nozzles shall be closed with plywood dummies.
- All electrical components assembled or loose shall be covered with polythene sheets along with silica gel pack.
- Silica gel desiccants shall be kept inside each case in sufficient quantities in order to absorb the moisture.

|                                                                                   |                                                                                                  |                                             |                 |
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- Thermocol packing shall be made for glass items like Ball vessel sight glass, Vpiece
- sight glass & pressure gauge.
- Silica gel desiccants shall be kept inside of each case to absorb the moisture.
- A Packing list covered in a polythene envelope shall be fixed inside and outside of each packing case.
- Shipping marks and consignee address shall be painted on the outer surface of the case.
- All handling instruction required for the case like top, sling, rain, handle with care etc, shall be marked on the case as per the symbol attached.
- Machined surface will be applied with Anti rust oil and covered by polyurethane sheet to protect from external oxidation.
- All valves will be closed with dummies to protect the internals and placed in the wooden case which will covered by polyurethane sheet.



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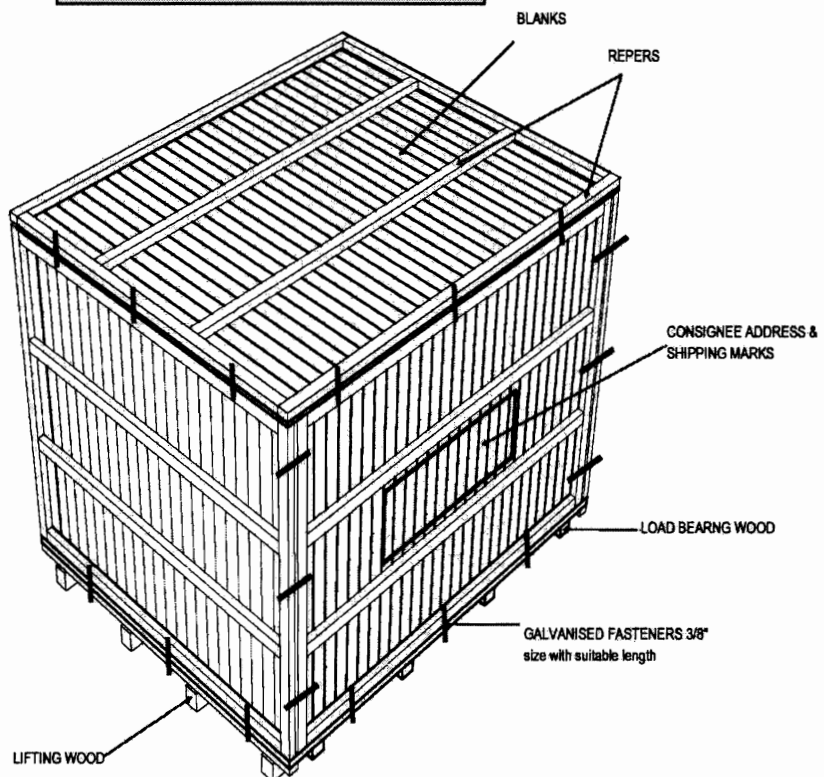
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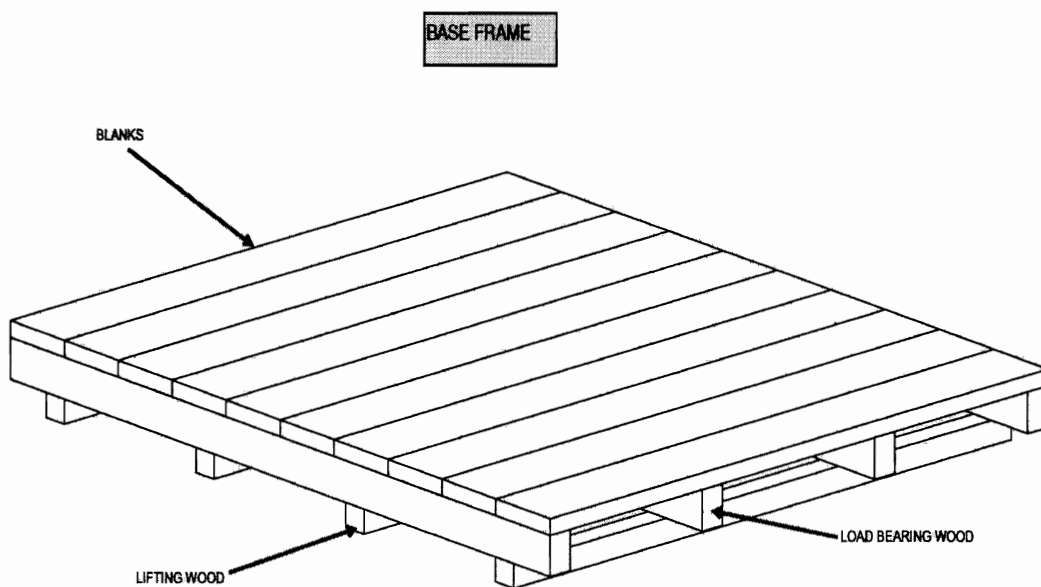
MODEL: FASTNERS TYPE (BASE, SIDE & TOP  
ATTACHED WITH BOLT, NUT & WASHER)

This Type of case to be used for  
following items:

1. BALL SEPERATOR
2. BALL COLECTOR SKID



|                                                                                   |                                                                                                  |                                             |                 |
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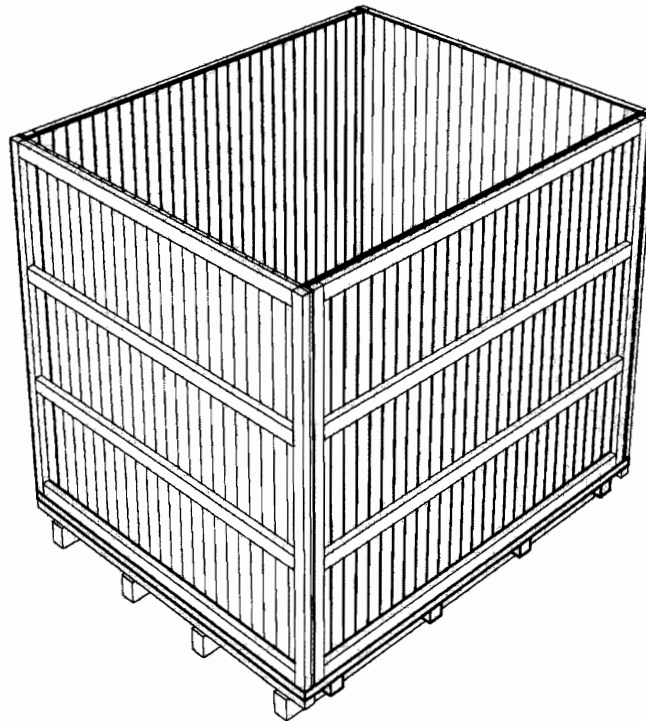
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MODEL: FASTNERS TYPE - WITHOUT TOP





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MODEL: NAILING TYPE  
(FRAME & INSIDE REEFER NAILED)

- THIS TYPE OF CASE TO BE USED FOR THE FOLLOWING ITEMS:
1. PUMP SKID
  2. CONTROL PANEL
  3. LOOSE ITEMS, TOOLS & TACKLES
  4. DPMS, BRM
  5. SPARES
  6. CLEANING BALLS
  7. CABLES & ACCESSORIES

Shipping marks & Consignee  
Address

BLANKS

LIFTING WOOD

BLANKS

REEPERS

BLANKS

REEPERS

LOAD BEARING WOOD

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# TITLE

## TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

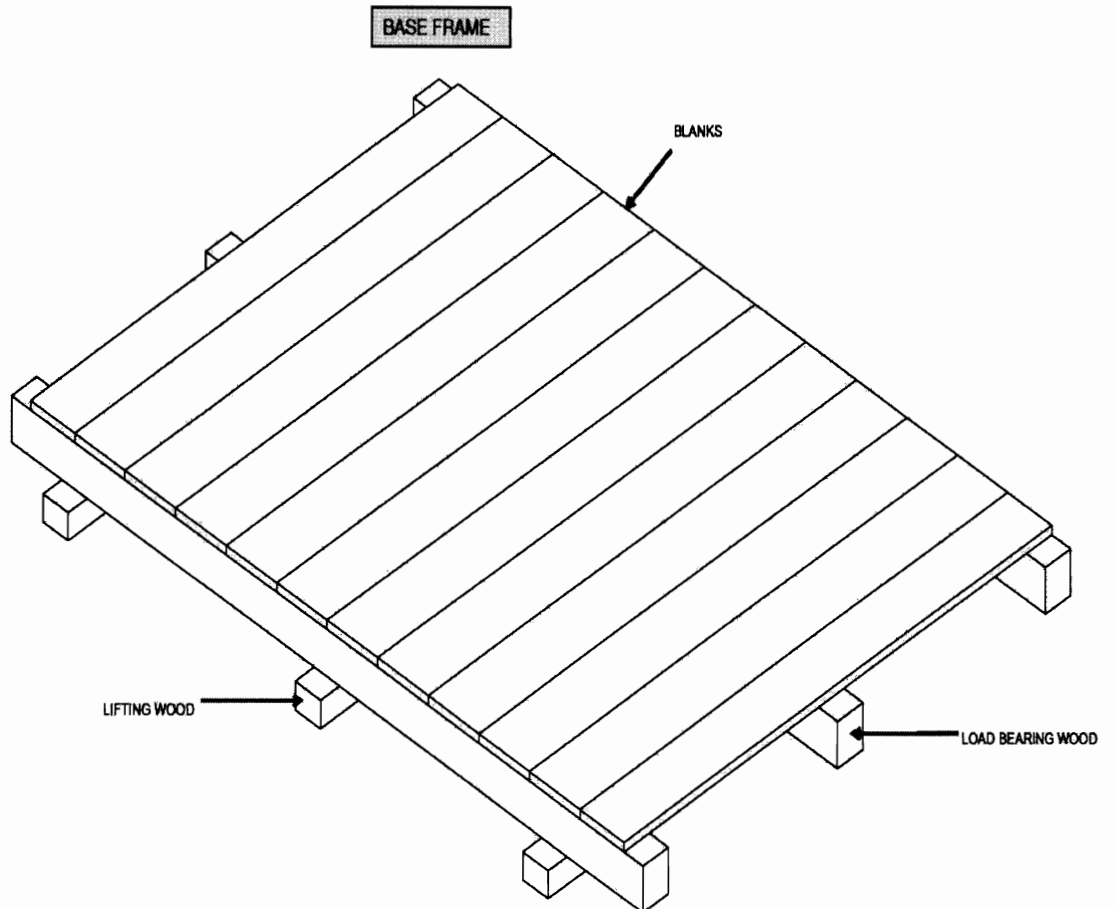
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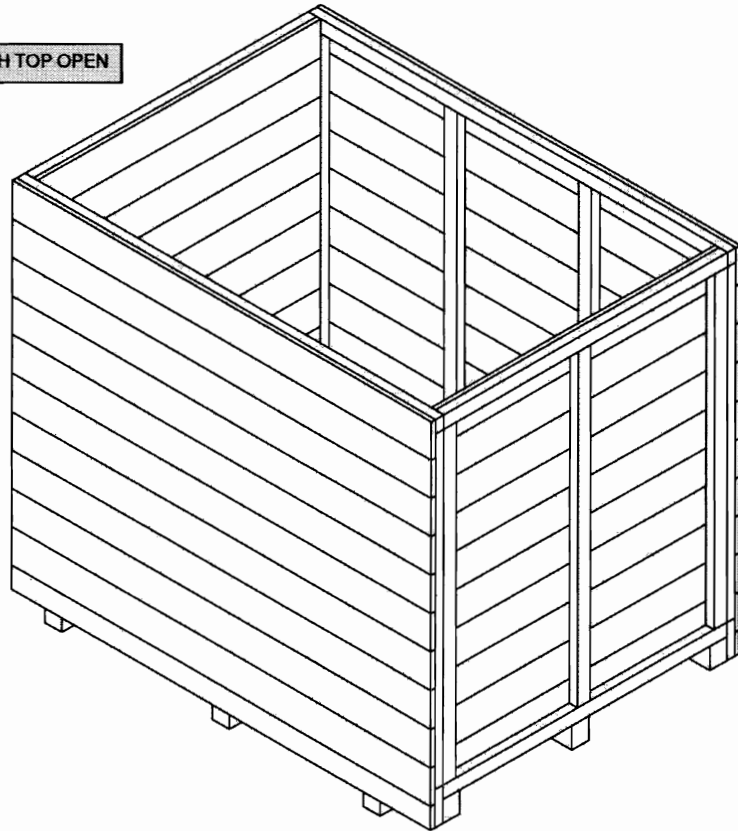
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|                                                                                   |                                                                                                  |                                             |                        |
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#### **10.4 PACKING OF LOOSE ITEMS**

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

The construction of wooden packing cases shall be as per clause 9.3.1 retaining its all features concerning strength of the box. The construction of wooden packing case for electrical and C&I items shall be as per fig-16.

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

#### **11.0 PACKING OF ELECTRICAL ITEMS**

##### **11.1 CABLES**

###### **11.1.1 Type of Equipment** All type of cables..

###### **11.1.2 Type of Construction**

New or practically new cable drums made of steel and painted with epoxy resin paint are to be used. Cable ends are carefully protected before packing. Over the cables polyethylene sheet shall be wrapped and then sealed properly. Cable drum can be put in wooden crates for ease in transportation and handling. (Wooden cable drum is also acceptable, however vendor to furnish constructional details for approval).



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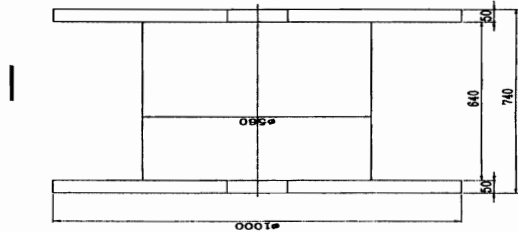
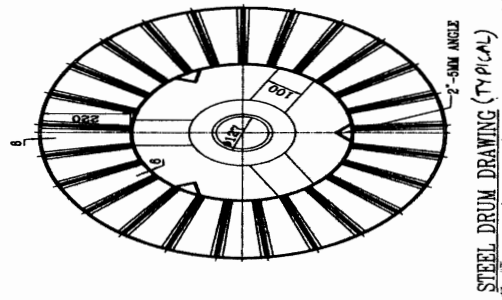
SPECIFICATION NO. PE-TS-888-100-A001

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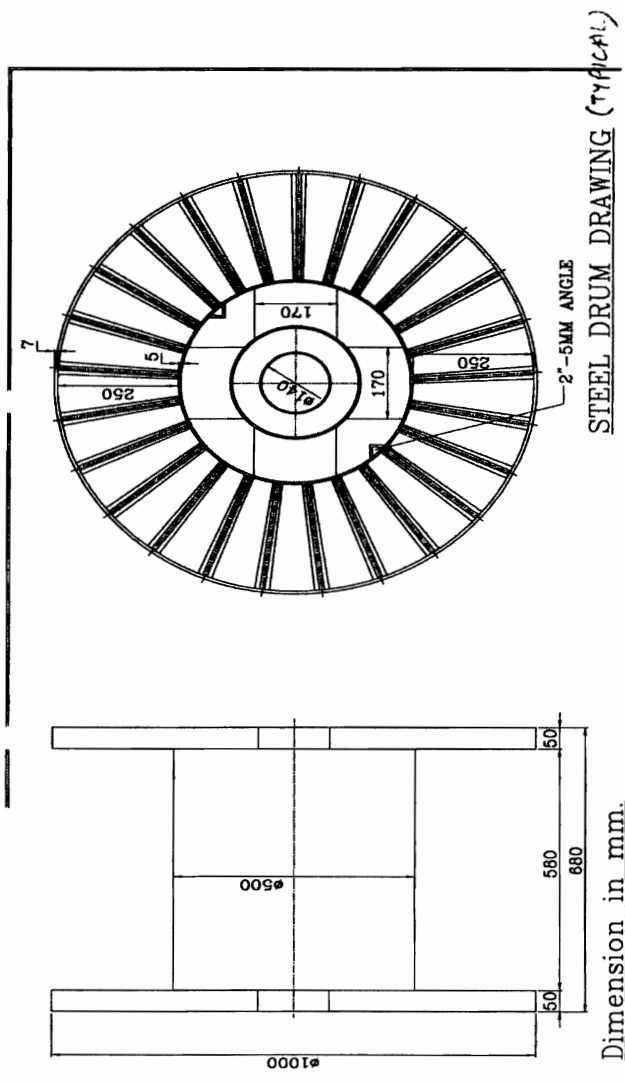
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## 11.2 PACKING OF CABLE TRAYS & ACCESSORIES AND CABLE TRAY SUPPORT MATERIAL

11.2.1 Cable trays can be packed in wooden boxes as per fig 1 to 11 or in steel boxes. Details of steel box construction is as indicated below.

- 1) All Dimensions are in "mm" unless otherwise stated.
- 2) Packing Box shall be fabricated using 50x50x6mm MS Angle, 50x3mm Flat, 2.5 mm thick C Channel, 1mm & 1.6mm Thick sheet.
- 3) Finish of Packing Box Shall be Galvanized.
- 4) Angle & Channel Section forming part of the Main frame shall be welded thoroughly with each other to give a rigid structure.
- 5) Sheet Section and Flat section shall be bolted/ Riveted/ Welded suitably to the Main frame stated in '4' above.

|                                                                                   |                                                                                                  |                                             |                 |
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- 6) Welding Portion on galvanized surfaces shall be painted with Zinc Rich Paint.
- 7) Dispatch details such as consignor/consignee address, contract and case details, 'country of origin, port of delivery, stacking instructions shall be written on one of the side of boxes. An anodized aluminium plate as per details and specifications given in page 3 of 5 shall be provided on the boxes
- 8) One copy of packing slip wrapped in polythylene bag covered with suitable aluminium .packing slip holder to be nailed on the external surface of the box. One more copy 9f the packing Slip wrapped in polythylene bag to be kept inside the box at the prominent place.
- 9) **INDICATION MARKS ON THE BOXES:** Markings shall be provided on the boxes indicating position of Boxes for handling, storage and nature of consignment. For guidelines referred page 4 of 5. The ink issued for this purpose as well as for marking dispatch instruction shall be indelible/non-washable marking ink.
- 10) Each item as mentioned in BOQ shall be packed & supplied as a set comprising of required numbers of associated fasteners & hardware etc

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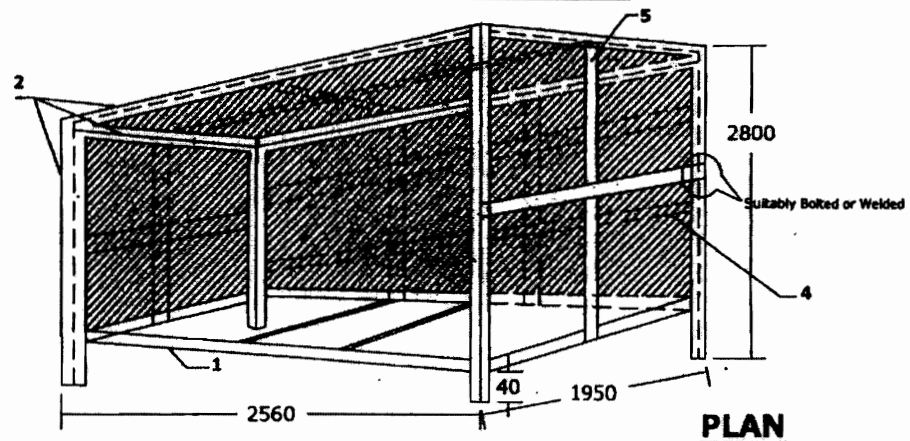
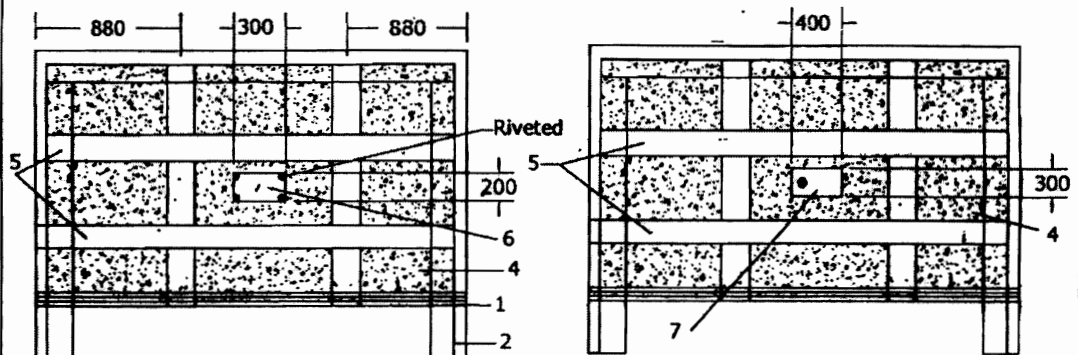
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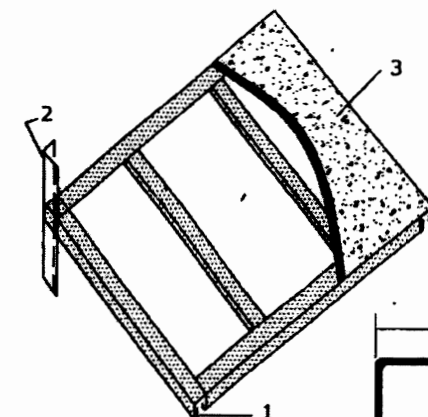
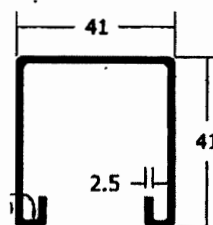
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**STEEL PACKING (TYPICAL DETAILS)****PLAN****FRONT SIDE OF BOX****BACK SIDE OF BOX****Note:**

1. "C" Channel to be used on Bottom Frame.
2. 50x50x6 Angle to be used Vertically on four sides of the Box and Horizontally on four sides on the top Frame.
3. 1.6mm thick sheet (plain) on Bottom Plate.
4. 1.0mm thick sheet to cover top & four sides of BOX.
5. 50x3 Flat as additional cross members to be used Horizontally & Vertically on top & Four Sides of Box.
6. Anodised Aluminium Plate for Marking.
7. Hinged Inspection Window.

**BOTTOM FRAME ARRANGEMENT****DETAILS OF "C" CHANNEL**

|                                                                                   |                                                                                                  |                                             |                 |
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### 11.3 PACKING FOR STATION LIGHTING SYSTEM

Aspects of packing specific to equipments / items of station lighting system are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

#### 11.3.1 For LIGHTING TRANSFORMER, DISTRIBUTION BOARDS, LIGHTING PANELS,

- Construction of packing case for LIGHTING DISTRIBUTION BOARDS, LIGHTING PANELS, TRANSFORMER . shall be EITHER as per FIGURE 1,2,3,5,6,7,8,9,10,11 OR FIGURE 14,15,16.
- Each Panel/Transformer shall be individually covered with double polythene sheet of thickness 175 microns minimum.
- All the 6 inner surfaces of packing shall be nailed with bitumen coated hessian polythene craft paper. Wherever 2 pieces of craft paper are used, the joint shall have minimum overlap of 20mm.

For the top frame it shall be project on all sides by 100mm and shall be nailed on sides .

- The gap between the panels and packing case shall be filled with rubberized coir of thickness 50mm minimum and width 100mm. The distance between two consecutive supports of rubberized coir shall be less than 500mm.
- Silica get packed in cotton bags shall be placed at different positions inside the packing.
- Packing case shall be finally covered with GI sheet of thickness 0.4mm minimum.

#### 11.3.2 For LUMINARIES, RECEPTACLES. EMERGENCY LIGHT, 240/24V TRANSFORMER, CEILING FAN, SWITCH BOARDS, FLEXIBLE CONDUIT, WIRES, EARTH WIRE. JUNCTION BOXES, ERECTION COMMISSIONING SPARES, RECOMMENDED SPARES , ERECTION MATERIAL AND CONSUMABLES

- Construction of packing case for THE ABOVE MATERIAL shall be as per FIGURE 1to11.
- Items placed inside the case shall be covered with double polythene sheet of thickness 175 microns minimum.
- All the 6 inner surfaces of packing shall be nailed with bitumen coated hessian craft paper. wherever 2 pieces of craft paper are used, the joint shall have minimum overlap of 20mm. For the top frame it shall be project on all sides by 100mm and shall be nailed on sides.
- Silica get packed in cotton bags shall be placed at different positions inside the packing.

#### 11.3.3 For CONDUIT PIPE

As per international practice pipes are shipped in open bundles with metal strapping. Packing as per attached figure A shall be provided which is described as following:

- Each bundle shall be wrapped with 2 layers of 175 microns thick polythene sheet.
- Then bundle will be wrapped with bitumen coated hessian craft paper.
- Bundle shall be strapped with steel straps.
- An anodized aluminium packing description plate as per Figure No. 13 shall be provided.

#### 11.3.4 For POLES

Poles will be wrapped with 2 layers of minimum 175 microns thick polythene sheet and then with bitumen coated hessian craft paper, packed as per Figure – C i.e. bundling.

#### 11.3.5 For STRUCTURAL STEEL

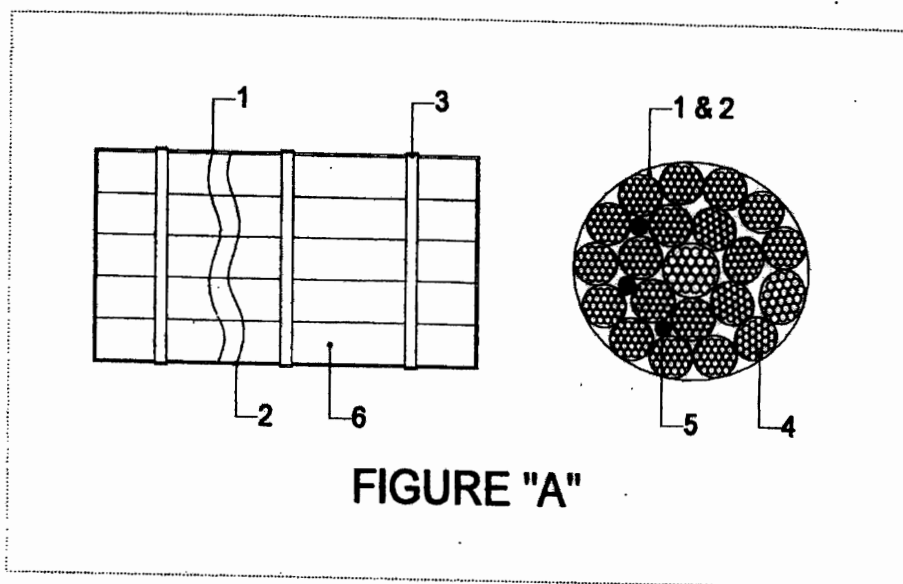
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Structural steel will be different sizes and shapes. Hence it will be packed as per Figure No. B and described as following :

- a) Each bundle shall be wrapped with 2 layers of 175 microns thick polythene sheet.
- b) Then bundle will be wrapped with bitumen coated hessian craft paper.
- c) Bundle shall be strapped with steel straps.
- d) An anodized aluminium packing description plate as per Figure No. 13 shall be provided.

|                                                                                   |                                                                                                  |                                      |                 |
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### **PACKING PROCEDURE FOR CONDUIT PIPE**



- 1) LAYER OF BITUMEN COATED HESSIAN KRAFT PAPER.
- 2) LAYER OF POLYTHENE SHEET.
- 3) METAL STRAPPING.
- 4) CONDUIT PIPES.
- 5) SILICA GEL POUCHES.
- 6) BUNDLES OF CONDUIT PIPES.

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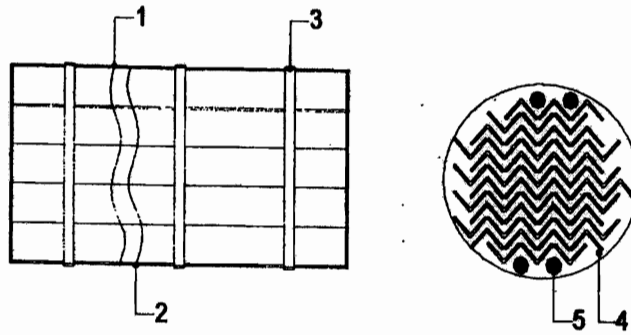
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**PACKING PROCEDURE FOR STRUCTURAL STEEL****FIGURE "B"**

- 1) LAYER OF BITUMEN COATED HESSIAN KRAFT PAPER.
- 2) LAYER OF POLYTHENE SHEET.
- 3) METAL STRAPPING.
- 4) STRUCTURAL STEEL.
- 5) SILICA GEL POUCHES.



# TITLE

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FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

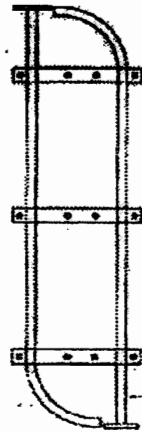
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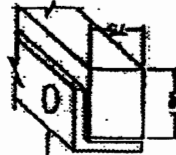
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## packing procedure for poles



POLES WRAPPED WITH POLYTHENE SHEET &  
EXTRUDING COATED HESSIAN CLOTH



TOP WOODEN BATTEN TO BE  
FIXED WITH L50x80x6 MM ON TOP  
OF IT FOR TIEING THE ROD  
25 MM DIA



BOTTOM WOODEN BATTEN TO BE  
FIXED ON L50x80x6 MM ANGLE

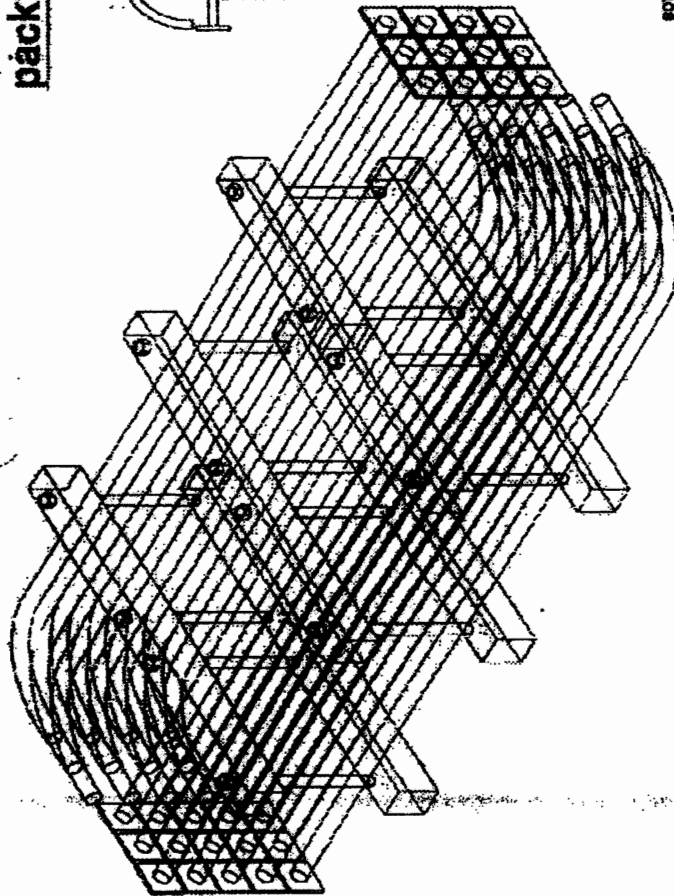


FIGURE "C"

|                                                                                   |                                                                                                  |                                             |                        |
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#### **11.4 PACKING FOR DC BATTERY**

The packing procedure for seaworthy packing of DC Battery is defined below, which is capable of withstanding impacts, compression, vibration, toppling, sea water spray, prevention against rust, temperature and extreme atmospheric conditions. Aspects of packing specific to equipments / items of DC Battery are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

The packing procedure consists of various stages namely primary packing, cushioning, securing, desiccant, outside packing box, Runners/ sliders/ transverse bars of plywood, etc., provided for each movement.

- a) The packing boxes shall be made up of plywood boxes (thickness 9mm min.) with blocks at the bottom of the box for provision for handling the boxes using the forklift. The packing boxes sizes are generally standardized to half-euro size (capable of handling equipment's weight).
- b) Rubberized coir of 25mm thickness shall be provided as cushioning material at the bottom and thermocole of 20mm shall be provided inside on all four sides. Other than this polyethylene film wrap or cover also will be provided. Left out spaces to be filled with rubberized coir/ thermocol to get cushioning effect.
- c) Silica gel in dust free air permeable cotton/paper bag shall be placed in the packing boxes for storage period of 1 year as per IS 304 (1979)
- d) While packing the cells, transit caps (polypropylene) of red and blue shall be used for big size cells for ensuring that cells does not get damaged during the transport due to vibrations etc.
- e) The battery accessories shall be packed with suitable precautions as follows:
  - i) Copper connectors shall be packed after making bunches with lead wire seals to avoid misplacement.
  - ii) Hardware items shall be packed in polyethylene bags (Thickness  $\geq 0.175\text{mm}$ ) with item slip
  - iii) Battery rack shall be packed in dismantled condition, wrapped with polyethylene sheet
  - iv) For Ni-Cd type battery, electrolyte in solid form for dry cells shall be packed in cans with KOH, LiOH being packed separately.
  - f) Galvanized Steel straps are provided for binding the packing box sides.
  - g) The handling instructions shall be marked in indelible/ non-washable ink, indicating the upright position.

#### **11.5 PACKING OF SERVICE TRANSFORMERS(OIL FILLED) & ACCESSORIES**

This instruction is applicable for packing of transformers (oil filled), its accessories and components so as to ensure safe delivery to end user. Aspects of packing specific to equipments / items of transformers(oil filled) are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

##### **11.5.01 PACKING DETAILS :**

- a) Items shall be packed in case / crates as per the shipping list.
- b) All fragile items and small items shall be packed in cases and to be marked as "Fragile, handle with care Fragile items".
- c) Fragile accessories are to be first packed in their original boxes (VENDOR's packing). Very

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- d small / delicate items such as glass thermometer, door keys shall be packed in separate box.
- d In case original box is found damaged, suitable alternate box or packing method using felt or foam sheet and polythene wrap to be used.
- e These boxes are then placed in identified wooden boxes. Inside of such boxes are lined with a layer of polythene sheet, packing wool / grass and another layer of polythene sheet before placing the boxes. All boxes are then wrapped with this polythene sheet before closing the box. Fragile items shall not be placed loose, one above the other inside the case.
- f All wiring cables, connection flats of non-ferrous materials, CTs, valves bellows shall also be packed.
- g Items like CTs, Oil communicating bushings, insulators, wired equipments and housings such as RTCC Panel, M. Box, Drive Mechanism, thermometers, gauges shall be wrapped in polythene from all around.
- h Buchholz relay and OSR relay openings will be blanked using covers, before putting them in the box
- i Items shall be carefully lowered and arranged inside the crate / case and each item shall be locked from all sides in such a way to avoid its movement in any way. Wooden stoppers and separators shall be provided for this and nailed to the crate / case wood.
- j Wooden planks and batons in contact with fragile items shall be provided with kit foam at the locations of contact.
- k Oil communication bushings shall be packed in separate case on V or U shape wooden felted supports, as in case of condenser bushings.
- l While placing and arranging the items inside the crates / cases, these shall be verified for correctness and then the packing note shall be signed. The cover top of the crate / case shall then be closed.
- m The main equipment like transformer tank shall be packed suitably to prevent any damage during transit / storage. Support structures like frame, header supports etc. shall be crated. Conservator headers shall also be crated. Radiators pipe work and other instruments & components shall be packed in cases. All the cases shall be lined with polythene from inside.

#### **11.6 ALTERNATIVE PACKING CASES FOR CONTROL PANELS AND SWITCH GEARS**

For Control and switch gear panels, construction of wooden packing cases may be provided as per fig 14 & 15 and as detailed below.

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

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

Diagonal bracings shall be as per cl 9.3.1.3 and all other requirements shall be as per clauses 9.3.1.4 to 9.3.1.6.

#### **12.0 Containerization**

As required by BHEL, the VENDOR shall stuff the GOODS into 20 or 40 foot containers (dry, open top, flat racks, etc.).

The maximum inside dimensions of containers are to be considered:

|                                                                                   |                                                                                                  |                                             |                        |           |           |
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- 40 foot containers: 11.80 m x 2.20 m x 2.05 m
- 20 foot containers: 5.80 m x 2.20 m x 2.05m
- 

The present definition of containerization is valid for sea containers only. Vendor to check the size of containers before start of packing of equipment.

#### **12.1 Protection of Cases/Crates**

Since shipping containers are in general not water tight, packing in contact with the floor of the container shall be raised in order to prevent it from being damaged by the accumulation of water.

#### **12.2 Mechanical Constraints**

The mechanical constraints for "general use" closed containers are of a different nature (height of "stacking" being limited inside the containers), the packing for the GOODS may be of a lighter structure. However, it is necessary that the packing be appropriate so as to protect the GOODS on site during the storage period, as required after discharging of the GOOD'S from the containers.

**Note:**

*It is the responsibility of the VENDOR to ensure that the cases/crates are stowed, secured and fastened inside the container. The VENDOR will take all necessary precautions to conform to the maximum weight allowed and the centre of gravity of the container. The securing and fastening of the cases/ crates can be carried out by nailing timbers on the bottom or on the vertical sides of the container.*

#### **13.0 Other Services to be provided by Vendor**

In addition to the packing and shipping documents, VENDOR must also carry out the following services, which shall be included in his quotation:

Carriage of VENDOR's sub-contracted equipment and material, which must be re-grouped in VENDOR's or PACKER's workshops, whilst waiting for packaging.

BHEL reserves the right to postpone the shipping of the GOODS. In this event, any storage and insurance costs during the first ninety (90) days shall be borne by the VENDOR.

Loading, including lifting, securing, lashing, and stowing, of all cases, crates, or packages onto means of transportation such as, but not limited to, trailers, containers, etc.

#### **14.0 Responsibilities and Guarantees**

VENDOR is responsible for the choice of category for packing according to the transport facilities used, and on the basis of the present document. In case of doubt or disagreement regarding the choice, VENDOR must inform BHEL prior to packing and await BHEL's approval. All phases of packaging, marking, loading, etc. will be subject to BHEL inspection.

BHEL reserves the right to reject the packing when the packing does not conform to these instructions and/or when the packing does not ensure perfect protection of the GOODS. VENDOR is responsible for the weights and dimensions declared, and the marking of the packages.

The documents must be in strict conformity with the packing contents.

The packing specified in these "Packing, Marking and Shipping Instructions" is guaranteed for a twelve (12) months storage period after delivery on site.

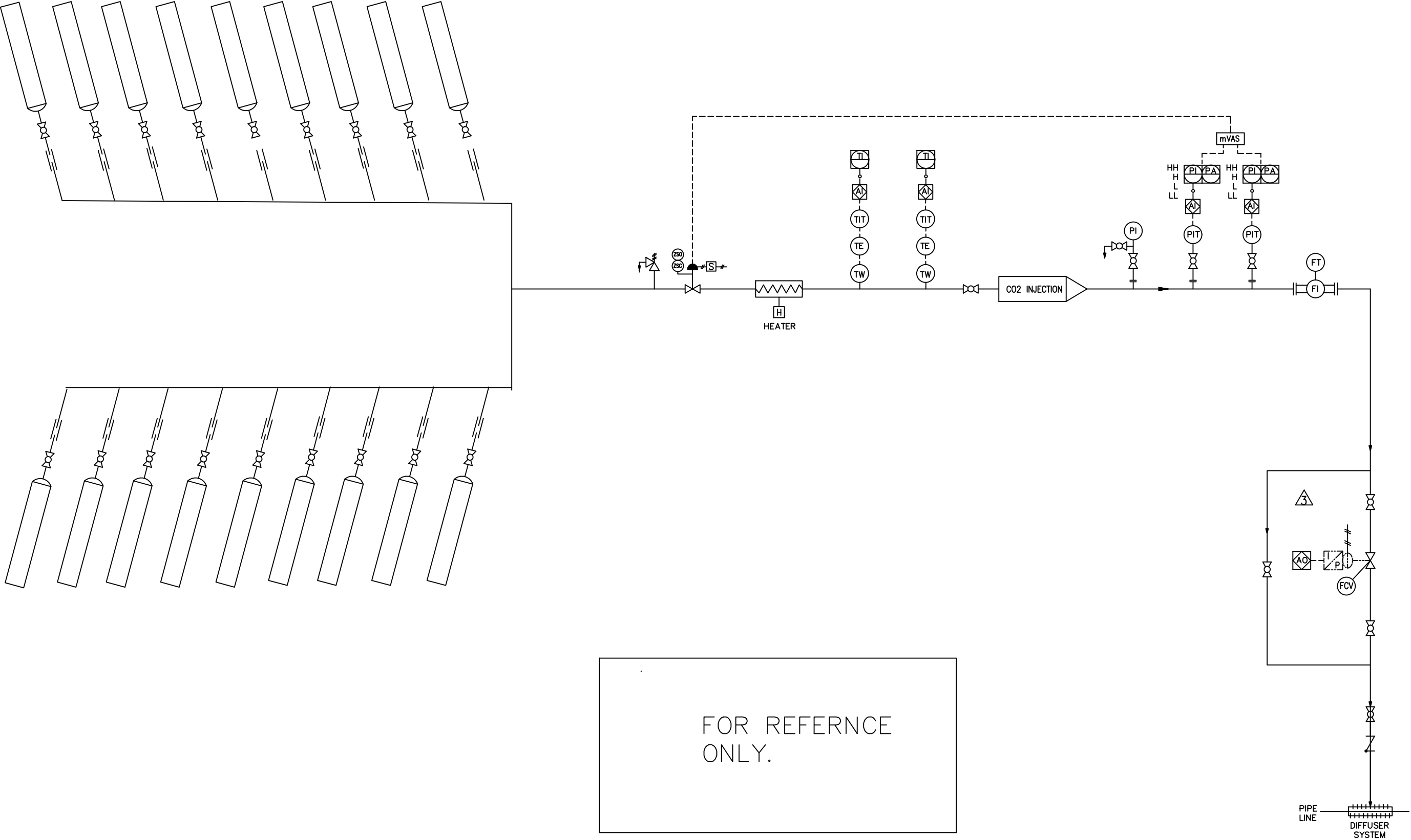
VENDOR is responsible for providing storage recommendation adapted to the GOODS. According to this guarantee, VENDOR is held responsible in the event of goods becoming

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useless, damaged or broken, as a result of poor packing and/or stowing, or due to corrosion, subsequent to insufficient or inadequate protection. All direct or indirect costs resulting thereof, will be back-charged to VENDOR.

CARBON DIOXIDE DOSING SYSTEM FOR MAITREE PROJECT.

ANNEXURE H



**ANNEXURE –M (MAITREE)**

**MANDATORY SPARES FOR CARBON DI OXIDE DOSING SYSTEM**

| <b>SL. No.</b> | <b>ITEM</b>    | <b>QUANTITY</b>                                           |
|----------------|----------------|-----------------------------------------------------------|
| 1              | COMPLETE VALVE | One (1) No. of each type & size<br>of valve in the system |
| 2              | COMPLETE MOTOR | One (1) No. of each type & size                           |

|      |                        | Manufacturer Name & Address: |       | MANUFACTURING QUALITY PLAN |                  |     |                                            |                  |                                                                                                                                                     |    |        |   |   |         |
|------|------------------------|------------------------------|-------|----------------------------|------------------|-----|--------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----|--------|---|---|---------|
|      |                        |                              |       | ITEM:                      |                  |     | QP NO:<br>REV. NO:<br>DATE:<br>Page 1 of 3 |                  | PROJECT: Maitree Super Thermal Power Project,<br>Rampal, Bagerhat-Bangladesh (2X660 MW)<br>PACKAGE: EPC PACKAGE<br>MAIN SUPPLIER: BHEL, BAP RANIPET |    |        |   |   |         |
| S.NO | COMPONENTS & OPERATION | CHARACTERISTICS              | CLASS | TYPE OF CHECK              | QUANTUM OF CHECK |     | REFERENCE DOCUMENT                         | ACCEPTANCE NORMS | FORMAT OF RECORDS                                                                                                                                   |    | AGENCY |   |   | REMARKS |
|      |                        |                              |       |                            | M                | C/B |                                            |                  | D                                                                                                                                                   |    | M      | C | B |         |
| 1    | 2                      | 3                            | 4     | 5                          | 6                |     | 7                                          | 8                | 9                                                                                                                                                   | D* | ** 10  |   |   | 11      |

|     |                  |                     |       |                      |      |      |            |  |    |   |   |   |   |  |
|-----|------------------|---------------------|-------|----------------------|------|------|------------|--|----|---|---|---|---|--|
| I.0 | RAW MATERIAL     |                     |       |                      |      |      |            |  |    |   |   |   |   |  |
| 1.1 |                  |                     | MAJOR |                      |      |      |            |  | TC | √ | P | V | - |  |
| 1.2 |                  |                     | CRT   |                      |      |      |            |  | TC | √ | P | V | - |  |
| 1.3 |                  |                     | MAJOR |                      |      |      |            |  | TC | √ | P | V | - |  |
|     |                  |                     | CRT   |                      |      |      |            |  | TC | √ | P | V | - |  |
| 1.4 |                  |                     | MAJOR |                      |      |      |            |  | TC | √ | P | V | - |  |
| 1.5 |                  |                     | MAJOR |                      |      |      |            |  | TC | √ | P | V | - |  |
| 2.0 | BOUGHT OUT ITEMS |                     |       |                      |      |      |            |  |    |   |   |   |   |  |
|     | MOTOR            | TYPE & ROUTINE TEST | MAJOR | PERFORMANCE PARAMETE | 100% | 100% | PROCEDURE) |  |    | √ | P | V | - |  |

|                               |               |                                                                                                                                                                                                                                                                                                                                                       |                                      |                |                |                  |
|-------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------|----------------|------------------|
|                               |               | <b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( √ ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.<br><b>** M:</b> MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER(BHEL), <b>B:</b> BIFPCL<br><b>P:</b> PERFORM <b>W:</b> WITNESS AND <b>V:</b> VERIFICATION. AS APPROPRIATE,<br><b>CHP:</b> BIFPCL SHALL IDENTIFY IN COLUM "B" AS ' W" | DOC.NO.:      REV.....      CAT..... |                |                |                  |
| MANUFACTURER/<br>SUB-SUPPLIER | MAIN-SUPPLIER |                                                                                                                                                                                                                                                                                                                                                       | FOR<br>BIFPCL<br>USE                 |                |                |                  |
| SIGNATURE                     |               |                                                                                                                                                                                                                                                                                                                                                       |                                      | REVIEWED<br>BY | APPROVED<br>BY | APPROVAL<br>SEAL |



|      |                        | Manufacturer Name & Address: |       | MANUFACTURING QUALITY PLAN |                  |     |                                            |                  |                                                                                                                                                  |    |        |   |  |         |
|------|------------------------|------------------------------|-------|----------------------------|------------------|-----|--------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----|--------|---|--|---------|
|      |                        |                              |       | ITEM:                      |                  |     | QP NO:<br>REV. NO:<br>DATE:<br>Page 2 of 3 |                  | PROJECT: Maitree Super Thermal Power Project, Rampal, Bagerhat-Bangladesh (2X660 MW)<br>PACKAGE: EPC PACKAGE<br>MAIN SUPPLIER: BHEL, BAP RANIPET |    |        |   |  |         |
| S.NO | COMPONENTS & OPERATION | CHARACTERISTICS              | CLASS | TYPE OF CHECK              | QUANTUM OF CHECK |     | REFERENCE DOCUMENT                         | ACCEPTANCE NORMS | FORMAT OF RECORDS                                                                                                                                |    | AGENCY |   |  | REMARKS |
|      |                        |                              |       |                            | M                | C/B |                                            |                  | D                                                                                                                                                | M  | C      | B |  |         |
| 1    | 2                      | 3                            | 4     | 5                          | 6                |     | 7                                          | 8                | 9                                                                                                                                                | D* | ** 10  |   |  | 11      |

|     |                                         |                                |       |              |      |      |                               |                               |         |   |   |   |   |  |
|-----|-----------------------------------------|--------------------------------|-------|--------------|------|------|-------------------------------|-------------------------------|---------|---|---|---|---|--|
|     |                                         |                                |       | R            |      |      |                               |                               | REPORT  |   |   |   |   |  |
| 3.0 | INPROCESS INSPECTION                    |                                |       |              |      |      |                               |                               |         |   |   |   |   |  |
|     |                                         |                                |       | MT/PT        | 100% | 100% | ASME SEC V                    | ASME SEC V                    | REPOR T | √ | P | W | - |  |
|     |                                         |                                |       | MEASU REMENT | 100% | 100% | DRAWING                       | DRAWING                       | DR      | √ | P | W | V |  |
|     |                                         |                                |       |              |      |      |                               |                               |         |   |   |   |   |  |
| 5.0 | FINAL INSPECTION                        |                                |       |              |      |      |                               |                               |         |   |   |   |   |  |
| 5.1 | IDENTIFICATION, PAINTING & PRESERVATION | COMPLIANCE TO COMPANY STANDARD | MINOR | VISUAL       | 100% | 100% | AS PER APPD PAINTING SCHEDULE | AS PER APPD PAINTING SCHEDULE |         | √ | P |   |   |  |

|                               |               |                                                                                                                                                                                                                                                                                                                                                       |                                      |                |                |                  |
|-------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------|----------------|------------------|
|                               |               | <b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( √ ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.<br><b>** M:</b> MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER(BHEL), <b>B:</b> BIFPCL<br><b>P:</b> PERFORM <b>W:</b> WITNESS AND <b>V:</b> VERIFICATION. AS APPROPRIATE,<br><b>CHP:</b> BIFPCL SHALL IDENTIFY IN COLUM "B" AS ' W" | DOC.NO.:      REV.....      CAT..... |                |                |                  |
| MANUFACTURER/<br>SUB-SUPPLIER | MAIN-SUPPLIER |                                                                                                                                                                                                                                                                                                                                                       | FOR<br>BIFPCL<br>USE                 |                |                |                  |
| SIGNATURE                     |               |                                                                                                                                                                                                                                                                                                                                                       |                                      | REVIEWED<br>BY | APPROVED<br>BY | APPROVAL<br>SEAL |



|      |                        | Manufacturer Name & Address: |       | MANUFACTURING QUALITY PLAN |                  |                                            |                    |                                                                                                                                                  |                   |    |        |   |  |         |
|------|------------------------|------------------------------|-------|----------------------------|------------------|--------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|--------|---|--|---------|
|      |                        |                              |       | ITEM:                      |                  | QP NO:<br>REV. NO:<br>DATE:<br>Page 3 of 3 |                    | PROJECT: Maitree Super Thermal Power Project, Rampal, Bagerhat-Bangladesh (2X660 MW)<br>PACKAGE: EPC PACKAGE<br>MAIN SUPPLIER: BHEL, BAP RANIPET |                   |    |        |   |  |         |
| S.NO | COMPONENTS & OPERATION | CHARACTERISTICS              | CLASS | TYPE OF CHECK              | QUANTUM OF CHECK |                                            | REFERENCE DOCUMENT | ACCEPTANCE NORMS                                                                                                                                 | FORMAT OF RECORDS |    | AGENCY |   |  | REMARKS |
|      |                        |                              |       |                            | M                | C/B                                        |                    |                                                                                                                                                  | D                 | M  | C      | B |  |         |
| 1    | 2                      | 3                            | 4     | 5                          | 6                |                                            | 7                  | 8                                                                                                                                                | 9                 | D* | ** 10  |   |  | 11      |

| <b>RECORD OF REVISION</b>                                                                                                                                                                               |      |             |  |  |  |  |  |  |  |  |  |  |  |  |        |      |             |  |  |  |  |  |  |
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| <table border="1" style="margin: auto;"> <tr> <th>REV NO</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> |      |             |  |  |  |  |  |  |  |  |  |  |  |  | REV NO | DATE | DESCRIPTION |  |  |  |  |  |  |
| REV NO                                                                                                                                                                                                  | DATE | DESCRIPTION |  |  |  |  |  |  |  |  |  |  |  |  |        |      |             |  |  |  |  |  |  |
|                                                                                                                                                                                                         |      |             |  |  |  |  |  |  |  |  |  |  |  |  |        |      |             |  |  |  |  |  |  |
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|                               |               |                                                                                                                                                                                                                                                                                                                                                       |                               |                                      |                |                  |
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| MANUFACTURER/<br>SUB-SUPPLIER | MAIN-SUPPLIER |                                                                                                                                                                                                                                                                                                                                                       | <b>FOR<br/>BIFPCL<br/>USE</b> |                                      |                |                  |
| SIGNATURE                     |               |                                                                                                                                                                                                                                                                                                                                                       |                               | REVIEWED<br>BY                       | APPROVED<br>BY | APPROVAL<br>SEAL |



| Sl.No | BHEL / Customer Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ##Specific confirmations by the manufacture |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 1     | <b>Quality Plan Requirement:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |
|       | (i) MQP (Manuafcutering Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Typical MQP is attached for indicative purposes for guidance & use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |
|       | (ii) MQP shall invariably cover w.r.t Inward inspection including on Raw materail Procurement, In process and Final inspection in elaborated way/details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |
|       | (iii) Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL/customer for finalization of Quality plan including test procedure/methodology during preaward / post award approval / detailed engineering in the event of an order.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |
|       | (iv) No deviation on BHEL/Customer approved MQP is acceptable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |
|       | (v) Bidder shall agree to submit all cross referred documents other than codes/standrads to BHEL/Customer/Consultant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |
|       | <b>Important Notes shall be included in MQP :</b><br>(a) Latest revision of Standard s & Specification shall apply. Only International Standards are applicable. Indian & Chinese Standards are not applicable<br>(b) Materials shall be procured in compliance to Functional Technical Specification.<br>(c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product.<br>(d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.<br>(e) Gauges and measuring Instruments, with valid calibration only shall be used.<br>(f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule.<br>(g) Finished Products shall be packed to comply with Approved Packing Schedule.<br>(h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.                                                                                                                    |                                             |
| 2     | <b>Domestic / Inland Inspection</b> will be carried out by BHEL/BHEL apointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consulatnat. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentaion Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |
| 3     | <b>Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources:</b><br>(1) Any one of the flowing Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself.<br>(2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. However cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own , then these charges non claimable by the bidder.<br><b>List of TPIA</b><br>1.M/s Bureau Veritas<br>2.M/s TUV-Nord<br>3.M/s TUV-SUD<br>4.M/s TUV Rheinland<br>5.M/s Lloyds Register<br>6.M/s SGS<br>7.M/s Germanischer Lloyds<br>8.M/s QUEST<br>9.M/s Certification Engineers International<br>10.M/s Intertek<br>11.M/s IR Class Systems and Solutions<br>12.M/s DNV<br>13. M/s Fichtner<br>14. M/s ABS Inspection Services |                                             |

| Sl.No | BHEL / Customer Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ##Specific confirmations by the manufacture |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 4     | <b>Stage Inspection during manufacturing Process :</b> Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review, verification and clearance for further processing. This inspection call shall be given well in advance (atleast 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |
| 5     | <b>Inspection before despatch for domestic supplier :</b> Inspection before despatch at supplier's works shall be carried out by BHEL/BHEL appointed Inspection agency. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                             |
| 6     | Inspection at Foreign Source/Supplier:<br>(a) As in sl no: 3. shall be ensured without fail<br>(b) No materail / items shall be despatched without getting the written communication from BHEL / Customer inspection carried out by BHEL/BHEL apointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consulatnat. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentaion Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable).<br>Inspection before despatch for Foreign supplier : Inspection before despatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in Sl no: 03 at supplier's cost. |                                             |
| 7     | <b>Painting</b> shall be done strictly as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc shall be brought to the notice to BHEL well in adavnce before proceding including the BOI being procured for assy / skid like motors etc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |
| 8     | Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages<br>(i) Index Sheet<br>(ii) MQP/RQP/Endorsement Sheet (As applicable)<br>(iii) TCs identified by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP.<br>(iv) Final inspection report + TC including Chemical + Mechnaical + HT + NDT etc<br>(v) Third party Inspection report + TC<br>(vi) Customer CHP/ MDCC<br>(vii) Type test / Performance Test reports conducted<br>(viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer<br>(ix) BOM with As Build Drgs with actual make / rating used with BHEL/customer approved drawings.                                                                                                                                                                                                                                                                                                                                                        |                                             |
| 9     | <b>Packing / Seaworthy Packing</b> shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care tarnsit / handling / transhipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |
| 10    | <b>Outsourcing of test facilities:</b> Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accreadted third party lab / Govt / Govt Lab for major testing such as NDT, Electrical & Mechanical testing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |
| 11    | <b>Important Note:</b> No deviation on the above requirement 01 to 10 is acceptable w.r.t Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidances in the offer itself.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                             |
| 12    | ## Necessorily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |

## SHIPPING MARKS

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**PO No.** \_\_\_\_\_ **dt** \_\_\_\_\_

**1. Consignee:-**

BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (P) LTD.  
2 X 660 MW MAITREE SUPER THERMAL POWER PROJECT  
BANGLADESH.

**2. EPC Contractor:-**

M/S, BHARAT HEAVY ELECTRICALS LTD. (BHEL).  
INDIA.

**3. Destination:-**

SITE INCHARGES,  
2X660 MW MAITREE SUPER THERMAL POWER PROJECT,  
PO: KALEKKHARBER, UNION-RAJNAGAR,  
UPAJILA-RAMPAL,  
DIST: BAGERHAT-9343, BANGLADESH,  
CONTACT NO. +8801678582823.

**4. Consignor:-**

BHARAT HEAVY ELECTRICALS LIMITED  
RANIPET, TAMILNADU,  
INDIA-632406.  
CONTRACT NO: BIFPCL/  
EPC-MAIN PLANT/2016-01  
PURCHASER: BIFPCL, BANGLADESH

**5. Package Number:**

**6. Net Weight (Kg) :**

**7. Gross Weight (Kg.):**

**8. Dimension in CM :**

**9. Po. Description & Qty:**