

Bharat Heavy Electricals Limited

Heavy Plates & Vessels Plant

Visakhapatnam – 530 012

Andhra Pradesh, INDIA

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INVITATION TO TENDER

Ref.: OS/21-22/7917&7920/IBR DE/06/010

Date: 02.07.2021

Sub : Cold Forming of CS Dished Ends (IBR) against S.O. No. 7917 & 7920

Dear Sir,

Sealed tenders are invited for the subject work in **two part bid** system from **IBR Registered Vendors** subject to the following eligibility criteria:

- (1) Bidders must have an experience in execution of similar jobs (i.e. Cold Forming of IBR Dished Ends) in the past 7 Years as on 30.06.2021. Bidders shall enclose relevant documents in support of their experience in execution of IBR Dished ends for at least one project.
- (2) Bidders shall have to enclose the documents of Valid IBR Registration, Firm Registration/ Factory License/ Certificate of Incorporation, Udyog Aadhar Memorandum (UAM) / Udyam Registration (if registered with MSME), PAN & GSTIN Registration.
- (3) The works executed in own name of the individual / firm of the tenderer will only be considered for eligibility criteria.

1. VENDOR'S SCOPE OF WORK:

- a) Cold Forming of Carbon Steel (IBR) Dished Ends (2:1 Ellipsoidal & Spherical Dishes) - **21 nos.** for various projects as detailed in Annexure – II with free issue Cut to size blanks as per applicable Drawings, QAP, Specifications, Procedures etc.
- b) Collection of Cut to Size blanks from Production Shops at HPVP-Visakhapatnam, Transportation of (i) Blanks from BHEL-HPVP, Visakhapatnam to Vendor works and (ii) Formed Dished Ends back to BHEL-HPVP, Visakhapatnam including transit insurance and delivery at HPVP Production shops.
- c) Profile of Spherical Dished Ends shall match with the outer diameter of Dished End as per drawings and the same are to be delivered in tack welded condition with Dished Ends as per the drawings.
- d) Free issue items i.e. Cut to Size Blanks cleared by QC (Shops) are to be collected within 5 days from the date of intimation by OS official without any failure. Any delay beyond 5 days shall be considered for levy of LD.
- e) Dished End supplier shall verify & confirm in their offer, the blank diameter required to meet overall dimensions and minimum thickness.
- f) Dimensions, ID & Thickness of formed Dished Ends shall be strictly within the tolerances given in the drawings, QAP / ITP.
- g) Material identification no. is to be maintained by Dish End manufacturer before, during & after forming operation.
- h) Obtaining approval of drawings from concerned Director of Boilers, if required and Co-ordination with IBR officials for Stage wise and Final Inspection and obtaining inspection clearance.
- i) **IBR Fees / Charges shall be in Bidder's scope.**
- j) Intermediate Heat Treatment / Stress Relieving, if required during forming, shall be carried out as per the Heating Cycle, indicated in the Dished End Forming procedure to be submitted by the Dished End vendor to BHEL for approval. After PWHT, HT chart shall be submitted to BHEL/TPIA & IBR along with the inspection reports for clearance for further operations.

Contd...2

- k) DP Test shall be carried out on outside and inside surface of the Knuckle Portion of Dished Ends.
- l) Preparation of necessary documentation and obtaining **IBR certification**.
- m) Though not mentioned specifically, any activity which is required for completion of the work is deemed to be included in the scope of bidders.

2. LOCATION OF WORK SPOT:

- a) Cold Forming of Dished ends shall be carried out at **Vendor's Works**.

3. BHEL SCOPE:

- a) Issue of applicable Drawings and Quality Plans etc.
- b) Issue of Cut to Size Blanks (including Welding & NDE of Joints in the blanks) as per drawings
- c) Loading of Blanks and unloading of finished Dished Ends at BHEL – HPVP, Visakhapatnam
- d) Height & TL Marking, Cutting of extra height and Edge Preparation
- e) Stress Relieving / Normalizing after formation/pressing of Dished ends

4. INSPECTION:

- a) Inspection shall be carried out at Vendor's works by M/s. BHEL / BHEL Authorized Inspection Agency and D.O.B. (Concerned Region) / IBR as per approved QAP.
- b) QAP / ITP enclosed with the tender is tentative only. Changes, if any made while approving the QAP, shall also be taken care by the Vendor for execution of the job. Approved QAP / ITP issued to the vendor after ordering shall only be followed for execution and inspection of the job.
- c) Dished End supplier shall furnish Inspection Reports for a) Method of Forming, b) Intermediate Heat Treatment, if any carried out, c) Dimensional Report including minimum thickness, d) NDE Reports, e) Results Template check etc., to BHEL as per approved QAP / ITP.
- d) All the documentation related to inspection clearance of BHEL / TPI / IBR /Customer, Generation of Inspection Reports, Preparation of Final Documents etc., as per BHEL standard formats is included in the scope of vendor and scanned scope submission of soft copy as well as hard copy of the same to BHEL-QA.

5. DELIVERY:

- a) Finished Dished ends along with all the relevant inspection documents as per approved QAP / ITP and all other certificates are to be delivered to HPVP, Visakhapatnam progressively **within 6 weeks** from the date of issue of blanks at HPVP shops.
- b) The delivery period will be calculated from the date of issue of blanks at HPVP, Visakhapatnam to the date of delivery of finished Dished Ends at HPVP, Visakhapatnam.
- c) **In case the delivery period offered by the vendor is more than the tender delivery, Loading for additional delivery period shall be @ 1/2 % per week or part thereof on the price quoted by the vendor for the purpose of evaluation of L1 status.**

6. PRICE:

- a) The prices shall be quoted for the detailed scope of work in the Schedule of Rates enclosed at Annexure-I only. The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.
- b) The quoted price shall be inclusive of all applicable taxes & duties except GST. Income tax shall be deducted at applicable rates from the vendor's bills. GST shall be reimbursable to the vendor as per applicable guidelines.

7. VALIDITY OF OFFER:

- a) The offer shall be valid for a period of **3 months** from the date of Reverse Auction.

8. GOODS & SERVICES TAX (GST):

Bidders shall make a note of the following points of GST before submission of their offer: -

- a) Vendors shall have to mention their GSTIN no. (15 Digits) in their Technical Bid. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering their offer.
- b) Semi-finished goods are to be delivered by the Vendors in BHEL, HPVP premises within a maximum period of one year from the date of issue of the material, failing which the whole transaction will be considered as Supply and Sale and GST is required to be paid along with interest (calculated @ SBI Base Rate + 6%) along with penalty, if any, from the date of Challan on the whole value of materials. Hence vendors shall have to ensure that materials issued to them are returned within 365 days.
- c) After fabrication, the vendors shall have to deliver the Semi-Finished Goods by fulfilling the following formalities: -
 - i) GST invoice should be raised by the vendors by paying GST on job work charges at applicable rates and by incorporating the HPVP GSTIN no. in the invoice for availing the reimbursement of GST from HPVP.
 - ii) The vendor shall also have to enter in their GST Return -1 (GSTR-1) the details of invoice raised for payment of GST so as to enable HPVP to avail input credit.

9. REVERSE AUCTION:

- a) BHEL shall be resorting to Reverse Auction (RA) for this tender. RA shall be conducted among the eligible techno-commercially qualified bidders. Business Rules for Reverse Auction are given at Annexure – V and Guidelines for Reverse Auction are available on our website, www.bhel.com → supplier registration → Guidelines for Reverse Auction 2021
- b) Sealed envelope / Electronic Price bids of all the techno-commercially qualified bidders shall be opened and the same shall be considered as initial bids of the bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope / Electronic price bid along with applicable loading, if any, shall be considered for ranking.
- c) BHEL will inform bidders the details of service provider who will provide business rules, all necessary training and assistance before commencement of online bidding. The bidders participating in the Reverse Auction shall have to necessarily submit '**Process Compliance Form**' (PCF) to the designated Service Provider.
- d) Bidders are advised to read the 'Business Rules' (Annexure – V) indicating details of RA event carefully, before reverse auction event.

10. RISK PURCHASE:

In case the contractor fails to execute the work within the scheduled time or due to any other reasons, BHEL – HPVP reserves the right to get the same completed through some other party at the risk & cost of the contractor and any additional expenditure incurred due to the same shall be charged to the contractor.

- 11. Other Terms & Conditions, whichever applicable, shall be as per Annexure – III enclosed.**

12. GENERAL:

- a) The bidders shall study the Tender documents, Drawings, Quality Documents and all other relevant documents in detail for understanding the scope of work and the processes involved before submission of offer. Bidders shall get clarifications, if any, from concerned officials on the scope of work, clarifications related to welding or any other details of the tender document, over phone between 09:00 AM and 04:00 PM on any working day or through e-mail.
- b) Drawings, QAP, Clarifications related to Welding, other reference documents etc., shall be sent to the bidder's e-mail address upon their written/e-mail request.
- c) **Conditional / Partial Price Bids and any other deviations to the tender terms & conditions are not acceptable** and BHEL reserves the right to reject such offers without further correspondence. Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry in the Techno-commercial Bids and **any deviations mentioned in the Price Bids shall not be considered.**
- d) BHEL reserves the right to modify or cancel the tender enquiry at any stage without assigning any reasons thereof.

13. The following documents shall form part of the tender enquiry: -

- | | |
|---|------------------|
| i) Schedule of Rates | : Annexure - I |
| ii) Details of Dished Ends to be formed | : Annexure - II |
| iii) General Terms & Conditions | : Annexure - III |
| iv) Acceptance to tender terms & conditions | : Annexure - IV |
| v) Business Rules for Reverse Auction | : Annexure - V |
| vi) GST Compliance for Indigenous Suppliers | : Annexure - GST |

14. TENDER SUBMISSION:

- a) Techno-commercial bids along with the tender document duly signed & stamped by the bidder on all pages and a covering letter on Company's Letter Head addressed to DGM (Outsourcing), BHEL -HPVP, Visakhapatnam shall be sent through an e-mail to the e-mail ID technicalbid-hpvp@bhel.in
- b) Price bid (i.e., Annexure - I) shall also be sent separately through e-mail to another e-mail ID pricebid-hpvp@bhel.in
- c) Offers completed in all respects along with all the supporting documents shall be sent to the above e-mails only latest by **14.00 Hrs. on 16.07.2021** duly mentioning the Name of Work, Tender Ref. No. & Date and Technical Bid / Price Bid in the subject of the e-mail.

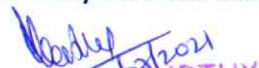
Note: Don't mark CC and BCC while submitting your offer as the system is designed to reject such mails having more than one recipient. Max. file size of the attachment shall be ≤ 20 MB only. In case, file size is more, bidder can submit their offer through multiple mails within the due date & time.

- d) **TENDERS RECEIVED AFTER THE DUE DATE & TIME ARE NOT ACCEPTABLE.**
- e) **OFFERS SENT IN ANY OTHER FORM WILL BE TREATED AS INVALID AND WILL BE SUMMARILY REJECTED.**

15. OPENING OF TENDERS:

- a) Techno-commercial Bids will be opened at **14.00 Hrs on 16.07.2021**. The bidders may depute their representatives at the time of opening of Technical bids.
- b) After evaluation of the Techno-commercial Bids, intimation regarding date & procedure of conducting reverse auction shall be given by the service provider to all eligible techno-commercially qualified bidders through an e-mail in advance at an appropriate time.

For Bharat Heavy Electricals Limited,


D. MURTHY
Dy. Manager (OS)

Bharat Heavy Electricals Ltd.
HPVP, Visakhapatnam-530 012

SCHEDULE OF RATES

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SCHEDULE OF RATES**Notes :**

- 1) **a) L1 status will be evaluated based on total quoted price.**
b) Bidder has to quote for all the items.
c) Part quotation is not acceptable and such bids shall be summarily rejected.
- 2) The quantity indicated above is tentative and may vary subject to the requirement at the time of ordering / execution. However, payment shall be made for the actual quantity only.
- 3) The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of work.
- 4) The quoted price shall be inclusive of all applicable taxes & duties except GST. However, GST shall be reimbursed by BHEL on submission of proof of GST payment.
- 5) The bidders are advised to go through all the drawings & documents before quoting the tender.
- 6) The evaluation currency for this tender shall be **INR**.
- 7) Tenderer should quote the amount in figures & words. It may be noted that corrections, overwriting etc. are not allowed. If there is a discrepancy between amount in figures & words, the amount in words shall prevail unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. If there is an error in the total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and total shall be corrected accordingly.

In case of mismatch between rate and amount in figures, rate in figures shall be taken into consideration for further evaluation and processing.

Signature of the Bidder with Stamp

Details of Dished Ends to be formed

Ref: OS/21-22/7917&7920/IBR DE/06/010

Date: 02.07.2021

SL No.	S.O. No.	PGMA	DRAWING No.	REV. No.	DESCRIPTION	SPEC	Dished End Size (mm)	Blank Size (mm)	QTY (Nos.)	Blank Weight (Kg)	Total Weight (Kg)
1	2:1 Ellipsoidal Dished Ends (IBR)										
1.1	7917	01-000	4-163-10-00705	0	2:1 Ellipsoidal Dished End	SA 516 GR.70	ID 4000 x 25 (Min) THK	OD 5000 x 28 THK	2	5495	10990
1.2	7917	02-000	4-163-10-00706	0	2:1 Ellipsoidal Dished End	SA 516 GR.70	ID 2200 x 20 (Min) THK	OD 2750 x 22 THK	2	1306	2612
1.3	7920	01-000	4-163-10-00710	0	2:1 Ellipsoidal Dished End	SA 516 GR.70	ID 3600 x 16 (Min) THK	OD 4500 x 20 THK	2	3180	6360
1.4	7920	02-000	4-163-10-00712	0	2:1 Ellipsoidal Dished End	SA 516 GR.70	ID 2000 x 12 (Min) THK	OD 2750 x 14 THK	2	832	1664
2	Spherical Dish (RF Pads)										
2.1	7917	01-000	1-163-11-11486	0	Spherical dish (R.F.Pad) (Item - S6)	SA 516 GR.70	OD 1295 x 25 (Min) THK	OD 1295 x 28 THK	2	369	738
2.2	7917	01-000	1-163-11-11486	0	Spherical dish (R.F.Pad) (Item - S3)	SA 516 GR.70	OD 945 x 25 (Min) THK	OD 945 x 28 THK	1	196	196
2.3	7917	02-000	1-163-16-11558	0	Spherical dish (R.F.Pad) (Item - H5)	SA 516 GR.70	OD 1295 x 20 (Min) THK	OD 1295 x 22 THK	1	290	290
2.4	7917	02-000	1-163-16-11558	0	Spherical dish (R.F.Pad) (Item - H7)	SA 516 GR.70	OD 450 x 20 (Min) THK	OD 450 x 22 THK	3	35	105
2.5	7917	02-000	1-163-16-11558	0	Spherical dish (R.F.Pad) (Item - H1)	SA 516 GR.70	OD 800 x 20 (Min) THK	OD 800 x 22 THK	1	111	111
2.6	7920	01-000	1-163-11-11492	0	Spherical dish (R.F.Pad) (Item - S6)	SA 516 GR.70	OD 1100 x 16 (Min) THK	OD 1100 x 20 THK	2	190	380
2.7	7920	01-000	1-163-11-11492	0	Spherical dish (R.F.Pad) (Item - S3)	SA 516 GR.70	OD 450 x 16 (Min) THK	OD 450 x 20 THK	1	32	32
2.8	7920	02-000	1-163-16-11559	0	Spherical dish (R.F.Pad) (Item - H5)	SA 516 GR.70	OD 1100 x 12 (Min) THK	OD 1100 x 14 THK	1	133	133
2.9	7920	02-000	1-163-16-11559	0	Spherical dish (R.F.Pad) (Item - H1)	SA 516 GR.70	OD 650 x 12 (Min) THK	OD 650 x 14 THK	1	47	47
								TOTAL	21		23658

GENERAL TERMS & CONDITIONS**1. TECHNICAL DELIVERY CONDITIONS:**

The work should conform to the technical data given in our drawings, GMS, Shipping List Specifications, QAP, WPS etc.

2. PARTY'S SCOPE:

The scope of the party shall be as follows: -

- a) All welding equipments, baking oven, tools, jigs and fixtures, measuring instruments duly calibrated, handling facilities, testing facilities etc.
- b) All materials other than those mentioned under "Free Issue Materials", which are required for completion of the work.
- c) All consumables such as electrodes, gases, grinding wheels etc.

Note: Electrodes of specification mentioned in the drawings / WPS and of BHEL approved brands only shall be used and MTCs of the same shall be submitted to BHEL for verification before use.

3. REVISION OF DRAWINGS:

There may be minor changes in the drawings during execution. In such a case, party should accommodate the same without any extra claim.

4. WELDING QUALIFICATION: Qualification of required number of Welders is party's responsibility at their cost.**5. X-RAY:**

All welding shall be of X-ray quality where specified on drawings. Inspection would specify the quantum of X-ray based on drawings / code requirement. Party should strictly follow the WPS and QAP issued by BHEL during welding. Getting the welds radiographed and getting them cleared by inspection is the responsibility of the party.

6. RECTIFICATIONS / REJECTIONS:

Any rectification due to defective work, if required, shall be done by the party free of charge with a suitable technology approved before hand by BHEL in writing. The cost of material, if any used for rectification work / rejection work, will be estimated by BHEL and the same shall be debited to party's account. In case any rectification / rework is to be carried out due to defective material supplied by BHEL, the replacement material and consumables will be supplied by BHEL free of Cost.

7. SECURITY DEPOSIT:

Vendors shall have to submit a Bank Guarantee for **10%** of the order value in case of **HPVP ADM site** or **25%** of the material cost in case of Vendor works towards Security Deposit and safe custody of materials within one week from the date of issue of Order. The BG shall be valid for the contract period with a claim period of 12 months. This Bank Guarantee shall be released to the contractor after completion of work and on acceptance of the same by BHEL / Owner

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

8. PERFORMANCE BANK GUARANTEE:

Vendors shall have to submit Performance Bank Guarantee (claim period of 12 months) for 10% of the order value covering for the defects liability period. If PBG is not submitted, 10% of the order value shall be deducted towards PBG from the final bill and shall be refundable after performance guarantee period, if no defects are found during this period.

9. RAW MATERIALS ISSUE:

Raw materials shall be issued with appropriate processing allowance and invisible wastage over the theoretical requirement of raw materials (**Plates, Sheets, Sections and Pipes**).

10. TRANSFER / RETURN OF LEFT OVER MATERIALS:

Party should maintain proper records for receipt & use of all free issue materials. The left over materials & scrap as per the material accounting statement shall be returned to HPVP stores along with finished job. Material Transfer Vouchers (MTV) from one order to another or from one vendor to another and Material Return Vouchers should be submitted immediately after transfer / return. The material reconciliation statement shall be submitted by the contractor after verification and certification by BHEL along with the final bill **within 30 days from the date of completion of work**. Otherwise, recovery for the balance materials shall be made from any of their pending bills without further intimation.

11. MATERIAL RECONCILIATION:

Orders issued to the vendors have to be completed in all respects including Material Accounting within a maximum of **180 days** from the **date of issue of the first material** from BHEL - HPVP stores.

Maximum of 0.5 % on the requirement of materials (**Plates, Sections and Pipes**) is admitted towards **process allowance and invisible wastage**.

Scrap quantity is permissible up to a **maximum of 1% on Structural (Beams, Channels, Angles, Rods, Pipes etc.), 2% on Sheets, 3% for Plates** on the theoretical requirement of materials.

If wastage and scrap is beyond the above limits, it should be fully justified with cutting diagrams etc. which are to be approved in advance by BHEL. **Otherwise, the cost of raw materials beyond approved limits will be recovered from the contractor as per BHEL recovery rates including applicable taxes & duties.**

Material reconciliation including return of balance materials, off-cuts is to be completed within 20 days from the date of completion of the order. The material reconciliation statement shall be submitted by the contractor after verification and certification by BHEL-HPVP along with the final bill **within 30 days from the date of completion of work**. Otherwise, recovery for the balance materials shall be made from any of their pending bills without further intimation,

Repeated occurrence of inordinate delays in returning and settling the material accounting will entail BHEL the right to terminate the contract forthwith or impose a temporary suspension on further loading at the discretion of BHEL.

12. SCRAP & OFF-CUT NORMS:

Sl. No.	Description	Scrap Size (in mm)	Off-Cut (in MM)
1.	CS/AS Sheets & Plates	Below 500 × 250	500 × 250 & above
2.	Rolled sections Rod, angles etc. (other than -tubes, pipes)	Below 1000	1000 & above
3.	Tubes & Pipes	Below 500	500 & above
4.	Universal column	Below 1000	1000 & Above
5.	SS Sheets & Plates	Below 500 × 250	500 × 250 & above
6.	SS Structural, Rods, Tubes, Pipes	Below 250	250 & above
7.	Non – ferrous: sheets & plates, rods & tubes	Below 500 × 250 (S & PL), Below 250 (Rods & Tubes)	500 × 250 & above, 250 & above
8.	Big size Scrap	(2500 & above) × (150 to 249)	-

13. INSPECTION:

Party shall contact our Quality Control Dept. for stages of inspection before commencement of job and should strictly follow the stages of inspection as per QAP.

14. WORKMANSHIP GUARANTEE:

The vendors should give workmanship guarantee for fabricated items for a period of 18 months from the date of last delivery of the order. Any defects due to incomplete work, faulty workmanship found in the fabricated items after delivery during the defects liability period shall be rectified / replaced by the vendor free of cost. Otherwise, the expenditure incurred towards the same will be recovered from the pending bills of vendors.

15. WORK PROGRESS:

The fabricator shall furnish a weekly report on the progress of work along with the status of availability of free issue materials and requirement of further materials, if any.

Outsourcing dept. personnel will visit vendor's works from time to time to assess and review the work progress. Free access shall be provided to BHEL or its inspection agency at all reasonable times of the day / night.

In case the progress is not satisfactory or supplies are delayed abnormally beyond the contractual delivery date, BHEL-HPVP, Visakhapatnam reserves the right to cancel the order in part or full or get the balance job in as is where is condition completed elsewhere by another agency at the risk and cost of Fabricator. The value of the work carried out by the party will be assessed by BHEL and the same shall be final. No compensation will be given to the fabricator in case of cancellation of order or diversion of balance job even if the jobs have been processed partly.

16. DELIVERY:

Finished items should be handed over to BHEL-HPVP on party's delivery challans along with Job completion certificate / Final Inspection Report from inspection agency / HPVP-QC department.

17. PENALTY:

If delivery exceeds the stipulated delivery schedule, penalty 1/2 % of the total value of order per week or part thereof subject to a maximum of 10% on the total value of the order will be levied. However, time taken for the following will not be considered as delay on the part of the Sub-Contractor.

- 1) Intermediate operations, if any, carried out by BHEL.
- 2) Waiting time for BHEL / Third party Inspection beyond a normal time of 3 days.

18. PAYMENT TERMS:

Payment shall be made against RA Bills within 45 days from the date of submission of Bill.

90% payment will be made after handing over of the finished equipments along with all inspection documents to HPVP shops / Logistics dept. / ADM site / Lova Garden site, duly inspected & cleared by Inspection authority. Balance 10% payment shall be made along with the Final Bill against completion of total order in all respects including documentation.

Vendors shall have to submit the bills in the formats specified by HPVP-Outsourcing and the bills submitted in the specified format along with necessary supporting documents are only admitted for processing. The following documents shall be submitted along with the Final Bill: -

1. No Claim Certificate from the contractor
2. No Dues Certificate from BHEL
3. Work Completion Certificate from BHEL
4. Material Reconciliation Statement submitted by the Contractor and certified by concerned authority of BHEL (if applicable)
5. Workmanship Guarantee certificate from the contractor

19. SECURITY:

All the documents of BHEL inclusive of Drawings, GMS and Standards made available to the fabricator should be kept in strict confidence and under no circumstance be made available to others or allow others to make use of them. Such documents shall be returned to BHEL on demand after completion of the job. This secrecy clause is binding on the employees of the fabricators also. Violation of the same may lead to suspension of business with the vendor and necessary legal action.

20. SUB-LETTING:

In general, sub-letting of jobs will not be permitted. But in special circumstances, this may be allowed. In such case, the party should obtain written approval from BHEL-HPVP, Visakhapatnam before sub-letting.

21. FACTORY RULES AND REGULATIONS:

Party shall abide by all the rules and statutory regulations in force from time to time as per factories act. It shall be party's responsibility to ensure the safety of their workmen and fulfilling the ESI, PF and other relevant statutory regulations.

22. SAFETY:

- a) Contractor shall adhere to safe construction practices, guard against hazardous & unsafe working conditions and shall comply with the safety rules of BHEL and local authorities. He shall maintain First Aid facilities for all his employees and labour. Contractor's responsibility includes supply of welder kit, all safety items such as safety belts, white and colour glasses, goggles, safety helmets, safety shoes etc.
- b) *Contractor and his employees shall follow all fire & safety, security regulations of BHEL.*

23. HOUSE KEEPING:

During execution of work, the contractor at all times keep the working place and storage area clean and free from accumulation of waste materials, rubbish etc.,

24. ACCIDENT / DAMAGE / CONDUCT ETC.:

Contractor will be held responsible for any disorderly conduct / misconduct, indiscipline, theft, smoking etc., on the part of his men. He will ensure summary eviction of such men from his premises failing which BHEL would remove them from the factory on his responsibility. Any damage to and or loss of equipment, machinery, building etc., to BHEL or BHEL employees, visitors or other contractors resulting from his own or any of his men's negligence shall be liable to be made good by him. Contractor shall be solely responsible for any accident in which you or your men or your equipment may be involved during the execution of contract on account of any reason what so ever.

25. TERMINATION OF CONTRACT:

In the event of any failure on the part of the contractor, BHEL reserves the right to terminate the contract by giving a notice of 2 weeks for any of the following lapses and contractual violations: -

- a) Failure to make labour payments in time as per the rules
- b) Failure to progress the job according to the agreed schedule
- c) Failure to mobilize adequate man power, tools & tackles and consumables in time
- d) Failure to adhere to Quality Standards of BHEL
- e) Refused to co-operate with other agencies working in the same area
- f) Failure to resolve labour disputes like strikes etc., within 7 days of occurrence
- g) Failure to comply with statutory regulations applicable at BHEL

BHEL shall also be free to intervene and take necessary remedial measures. All costs incurred with interest and overheads shall be recovered from contractor by such foreclosing or off-loading any part of the contract work.

26. DISPUTES:

Head of BHEL- HPVP Unit will be the final authority for any disputes arising out of this contract. The disputes / arbitration / settlement of contractual or legal issues shall be under the Jurisdiction of Visakhapatnam Court.

27. For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of Contract / PO / 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.

28. The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

Signature of the Bidder with Stamp

Acceptance to Tender Terms & Conditions

I / We hereby confirm that the Tender documents, Drawings, Quality documents etc. have been studied in detail and we have fully understood the scope of work.

I / We accept to all the Terms and Conditions of the Tender Enquiry and the prices quoted are in accordance with the same.

I / We give our acceptance to participate in reverse auction for this tender.

Tender documents duly signed on all the pages by the Owner / authorized representative of the bidder are attached herewith.

Signature of the Bidder with Stamp

BUSINESS RULES FOR REVERSE AUCTION (RA)

This has reference to tender no. **OS/21-22/7917&7920/IBR DE/06/010, dated 02.07.2021**. BHEL shall finalize the Rates for **Partial Fabrication of L&T Vessels (with Boots) against S.O. 2438 at HPVP-Lovagarden site, Visakhapatnam** through Reverse Auction mode. BHEL has made arrangement with an authorized Service provider (details will be shared before reverse auction) for conducting RA. Bidders should go through the instructions given below and submit acceptance of the same.

The technical & commercial terms are as per (a) BHEL Tender Enquiry No. **OS/21-22/7917&7920/IBR DE/06/010, dated 02.07.2021**, (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) Price bids of all techno-commercially qualified bidders shall be opened.
- ii) **Reverse Auction:** The 'bid decrement' will be decided by BHEL.
- iii) The lowest bidder in sealed envelope price 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. However, no bidder shall be allowed to lower its bid below the current L1 by more than 5 decrements at one go.
- v) After the completion of the reverse auction, the Closing Price shall be available for further processing.
- vi) **Wherever the evaluation is done on total cost basis, after Reverse Auction, prices of individual line items shall be reduced on pro-rata basis.**

2. Schedule for reverse auction: The Reverse Auction schedule will be intimated to all the eligible techno-commercially qualified bidders at a later stage.**3. Auction extension time:** If a bidder places a bid in the last {5} minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another {5} 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 {5} 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 {5} minutes. In case, there is no bid in the last {5} 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 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, taxes, duties, freight and insurance **except GST** as specified in tender document 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 mentioned in the tender.

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 3 months 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 Reverse Auction will be considered as the bidder's final offer to execute the work.
8. Unique user IDs shall be used by bidders during bidding process. 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 separately intimated to respective 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 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. 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.

In order to ward-off contingent situation of connectivity failure 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 safe guard 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, quoted during the 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).
17. Bidders' bid will be taken as an offer to execute the work/ supplies the item as per enquiry no. **OS/21-22/7917&7920/IBR DE/06/010, dated 02.07.2021**. 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).
18. Bidders shall be able to view the following on their screen along with the necessary fields during 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)*, shall be initiated by BHEL.

Signature of the Bidder with Stamp

GST COMPLIANCE FOR INDIGENOUS SUPPLIERS

1. In Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GSTIN which should be clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
2. Supplier shall mention their GSTIN in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc.
3. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).
4. A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL.
5. All documents like Test Certificate, LR copy, Guarantee/Warranty certificate, work completion certificate, any other document mentioned in PO, shall be sent along with the vehicle/consignment where ever applicable. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so.
6. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the suppliers, within the calendar month notified by BHEL.
7. For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned above), interest (calculated @ SBI Base Rate + 6%) along with penalty if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills.
8. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contractors. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.
9. This is to inform that GST portion of invoice, shall be released only upon Vendor declaring such invoice in his GSTR-1 and receipt of goods and Tax invoice by BHEL and Confirmation of payment of GST thereon by vendor on GSTN portal. Alternatively, BG of appropriate value may be obtained from vendor which shall be valid At least one month after the confirmation of date of payment of GST by vendor on GSTN portal and receipt of Tax invoice and receipt of goods, whichever is later. Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.
10. That in case vendor delays Declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.

Note: The above will be followed strictly for processing vendor payments to ensure GST Compliance.

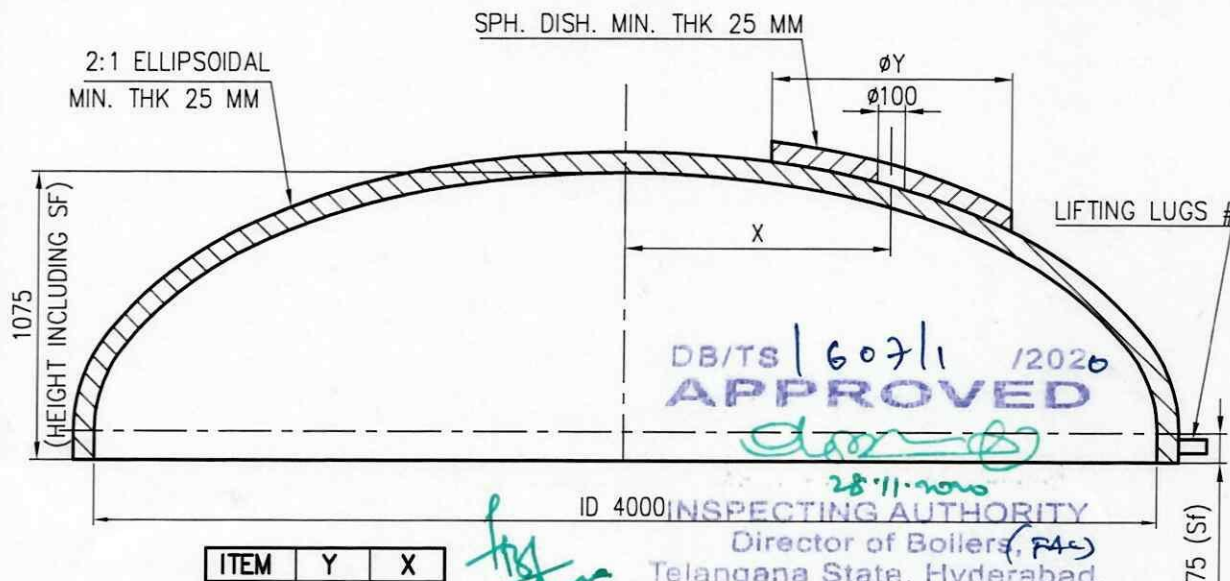
Signature of the Bidder with Stamp

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

REV.	DATE	ALTERED	CHECKED	APPD.	REV.	DATE	ALTERED	CHECKED	APPD.	ADDITIONAL INFORMATION
										STATUS OF DRAWING
										DISTURBUTION OF PRINTS



NOTES

- MATERIAL SHALL CONFIRM TO SA516 Gr.70 OF ASME SEC-II PART-A YEAR OF EDITION AS PER INDENT/ PO.
- INSPECTION: BY M/s IBR/DOB & BHEL APPROVED TPIA.
- CERTIFICATION: IBR FORM III-C.
- DESIGN CODE: IBR REGULATIONS (CLASS-1 BOILER).
- PLATE SHALL BE UT TESTED BEFORE FORMING (NOT REQUIRED IF ALREADY UT TESTED AT MILLS)
- SPHERICAL DISH SHALL BE OF SEAMLESS CONSTRUCTION & PROFILE SHOULD MATCH WITH DISHED DISHED END OD AS SHOWN IN THE DRG.
- NORMALISING SHALL BE DONE FOR SPHERICAL DISH ALSO AFTER PRESSING.
- TEST COUPON TESTING IS REQUIRED.
- TECHNICAL & DELIVER CONDITIONS: AS PER PRODUCT STANDARD HE51370.

FOR PLATE WELDING REFER DRG. 4-163-10-00707.

3 NOS. LIFTING LUGS TO BE WELDED ON Sf AT 120° AND TO BE DP CHECKED AFTER WELDING.

ITEM NO.	DESCRIPTION	DRAWING NO.	MATL. CODE	UNIT Wt.
			MATL. SPEN.	QTY.

BHARAT HEAVY ELECTRICALS LTD.		DRN.	NAME	SIGN.	DATE	NO. OF
HYDERABAD		CHD.	B. UMA	B. UMA	17.07.20	VAR.
		APPD.	BINAY JHA	BINAY JHA	17.07.20	
			SUBRATA RAY	SUBRATA RAY	17.07.20	

DEPT. HED	GRADE OF TOL. DIM. C/M/F	SCALE NTS	WEIGHT (KG)	REF. TO ASSY DRG.	ITEM NO.	NO. OF ITEMS
CODE 405						

TITLE	CARD CODE	DRAWING NO.	REV.
SPHERICAL DISH WITH 2:1 ELLIPSOIDAL DISHED END		4-163-10-00705	00

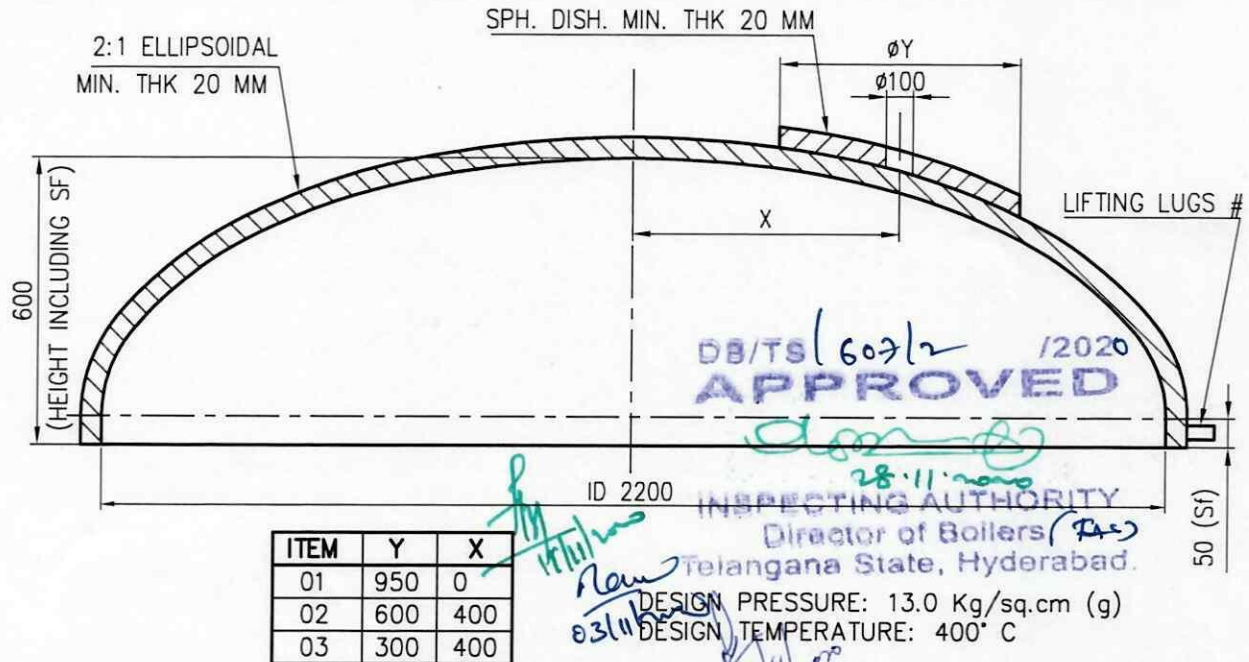
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

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REV.	DATE	ALTERED	CHECKED	APPD	REV.	DATE	ALTERED	CHECKED	APPD	ADDITIONAL INFORMATION
										STATUS OF DRAWING
										DISTURIBUTION OF PRINTS



NOTES

1. MATERIAL SHALL CONFIRM TO SA516 Gr.70 OF ASME SEC-II PART-A YEAR OF EDITION AS PER INDENT/ PO.
2. INSPECTION: BY M/s IBR/DOB & BHEL APPROVED TPIA.
3. CERTIFICATION: IBR FORM III-C.
4. DESIGN CODE: IBR REGULATIONS (CLASS-1 BOILER).
5. PLATE SHALL BE UT TESTED BEFORE FORMING (NOT REQUIRED IF ALREADY UT TESTED AT MILLS)
6. SPHERICAL DISH SHALL BE OF SEAMLESS CONSTRUCTION & PROFILE SHOULD MATCH WITH DISHED DISHED END OD AS SHOWN IN THE DRG.
7. NORMALISING SHALL BE DONE FOR SPHERICAL DISH ALSO AFTER PRESSING.
8. TEST COUPON TESTING IS REQUIRED.
9. TECHNICAL & DELIVER CONDITIONS: AS PER PRODUCT STANDARD HE51370.

FOR PLATE WELDING REFER DRG. 4-163-10-00708.

3 NOS. LIFTING LUGS TO BE WELDED ON Sf AT 120° AND TO BE DP CHECKED AFTER WELDING.

ITEM NO.	DESCRIPTION	DRAWING NO.	MATL. CODE	UNIT Wt.
			MATL. SPEN.	QTY.
BHEL		BHEL		
BHARAT HEAVY ELECTRICALS LTD.		DRN.	NAME	SIGN.
HYDERABAD		CHD.	BINAY JHA	BINAY JHA
		APPD.	SUBRATA RAY	SUBRATA RAY
DEPT. HED	GRADE OF TOL. DIM. C/M/F	SCALE	REF. TO ASSY DRG.	ITEM NO.
CODE 405		NTS		
TITLE		CARD CODE	DRAWING NO.	REV.
SPHERICAL DISH WITH 2:1 ELLIPSOIDAL DISHED END			4-163-10-00706	100
Printed by : UMA MAHESWARI BANOTHU-RCP-FME3166 / 6146546 on 16/07/2020				
SHEET NO. 1 NO OF SHEETS				

FIRST ANGLE PROJECTION

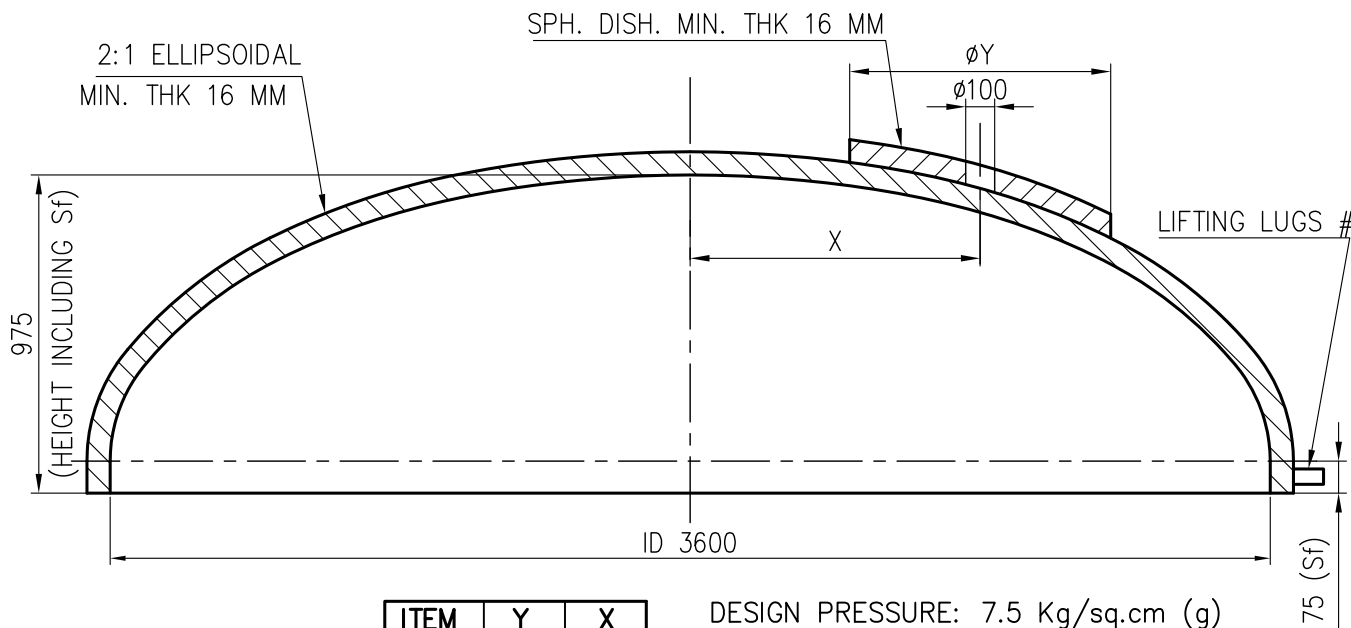
(ALL DIMENSIONS ARE IN mm)

BHARAT HEAVY ELECTRICALS LIMITED.

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

INVENTORY NO. SIGN. AND DATE REF. DRG. NO.

REV.	DATE	ALTERED	CHECKED	APPD	REV.	DATE	ALTERED	CHECKED	APPD	ADDITIONAL INFORMATION
										STATUS OF DRAWING
										DISTURIBUTION OF PRINTS



ITEM	Y	X
01	300	1100
02	850	600

NOTES

1. MATERIAL SHALL CONFIRM TO SA516 Gr.70 OF ASME SEC-II PART-A YEAR OF EDITION AS PER INDENT/ PO.
2. INSPECTION: BY M/s IBR/DOB & BHEL APPROVED TPIA.
3. CERTIFICATION: IBR FORM III-C.
4. DESIGN CODE: IBR REGULATIONS (CLASS-1 BOILER).
5. PLATE SHALL BE UT TESTED BEFORE FORMING (NOT REQUIRED IF ALREADY UT TESTED AT MILLS)
6. SPHERICAL DISH SHALL BE OF SEAMLESS CONSTRUCTION & PROFILE SHOULD MATCH WITH DISHED DISHED END OD AS SHOWN IN THE DRG.
7. NORMALISING SHALL BE DONE FOR SPHERICAL DISH ALSO AFTER PRESSING.
8. TEST COUPON TESTING IS REQUIRED.
9. TECHNICAL & DELIVER CONDITIONS: AS PER PRODUCT STANDARD HE51370.
10. AFTER FORMING ,WELD JOINTS SHALL BE 100% UT.

FOR PLATE WELDING REFER DRG. 4-163-10-00711.

3 NOS. LIFTING LUGS TO BE WELDED ON Sf AT 120° AND TO BE DP CHECKED AFTER WELDING.

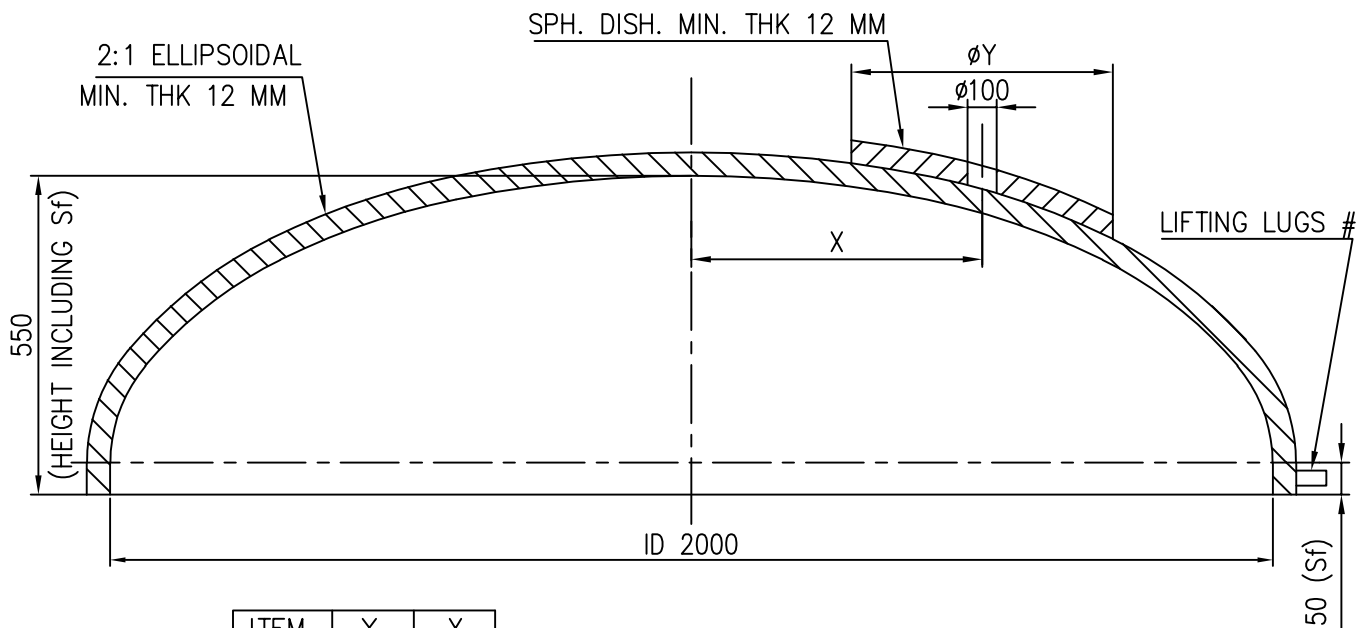
ITEM NO.	DESCRIPTION	DRAWING NO.	MATL. CODE	UNIT Wt.
			MATL. SPEN.	QTY.

	BHARAT HEAVY ELECTRICALS LTD.		DRN.	NAME	SIGN.	DATE	NO. OF
	HYDERABAD		CHD.	B VENKANNA	BINAY K JHA	08.03.21	VAR.
			APPD.	SUBRATA RAY	SUBRATA RAY	08.03.21	

DEPT. HED	GRADE OF TOL. DIM. C/M/F	SCALE NTS	WEIGHT (KG)	REF. TO ASSY DRG.	ITEM NO.	NO. OF ITEMS
CODE 405						

TITLE	SPHERICAL DISH WITH 2:1 ELLIPSOIDAL DISHED END	CARD CODE	DRAWING NO. 4-163-10-00710	REV. 00
JUL 25 15:13 2021		This Drawing is printed from Engineering Digital Archive System (EDAS). Therefore signatures are not essentially required.		
SHEET NO. 1		NO OF SHEETS		

REV.	DATE	ALTERED	CHECKED	APPD	REV.	DATE	ALTERED	CHECKED	APPD	ADDITIONAL INFORMATION
										STATUS OF DRAWING
										DISTURIBUTION OF PRINTS



ITEM	Y	X
01	500	245
02	800	0


DESIGN PRESSURE: 7.5 Kg/sq.cm (g)
DESIGN TEMPERATURE: 350° C

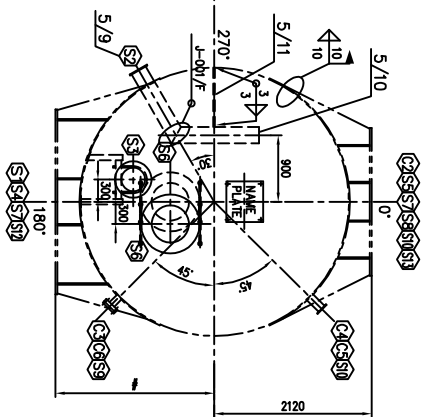
NOTES

1. MATERIAL SHALL CONFIRM TO SA516 Gr.70 OF ASME SEC-II PART-A YEAR OF EDITION AS PER INDENT/ PO.
2. INSPECTION: BY M/s IBR/DOB & BHEL APPROVED TPIA.
3. CERTIFICATION: IBR FORM III-C.
4. DESIGN CODE: IBR REGULATIONS (CLASS-1 BOILER).
5. PLATE SHALL BE UT TESTED BEFORE FORMING (NOT REQUIRED IF ALREADY UT TESTED AT MILLS)
6. SPHERICAL DISH SHALL BE OF SEAMLESS CONSTRUCTION & PROFILE SHOULD MATCH WITH DISHED DISHED END OD AS SHOWN IN THE DRG.
7. NORMALISING SHALL BE DONE FOR SPHERICAL DISH ALSO AFTER PRESSING.
8. TEST COUPON TESTING IS REQUIRED.
9. TECHNICAL & DELIVER CONDITIONS: AS PER PRODUCT STANDARD HE51370.
10. FOR CUTTING PLAN REFER DRAWING NO. 4-163-10-00713.

3 NOS. LIFTING LUGS TO BE WELDED ON Sf AT 120° AND TO BE DP CHECKED AFTER WELDING.

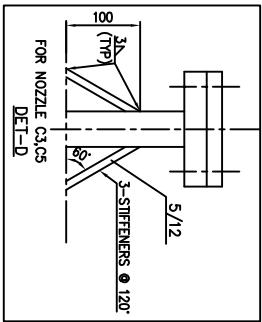
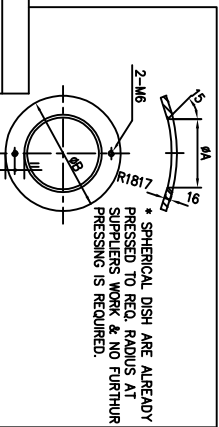
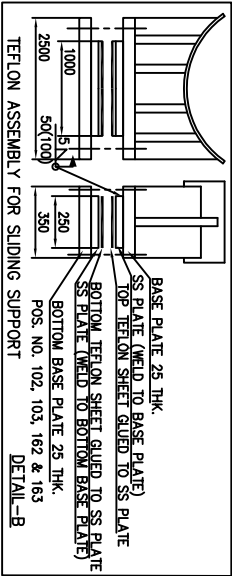
ITEM NO	DESCRIPTION	DRAWING NO.	MATL. CODE	UNIT Wt.
			MATL. SPEN.	QTY.

<div><div>बी एच ई एल</div><div>BHEL</div></div>		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		DRN.	NAME B VENKANNA	SIGN. <i>B Venkanna</i>	DATE 08.03.21	NO.OF VAR.
				CHD.	BINAY K JHA	B.K.J.	08.03.21	
				APPD.	SUBRATA RAY	S.R.	08.03.21	
DEPT. HED	GRADE OF TOL.DIM. C/M/F		SCALE NTS	WEIGHT (KG)	REF. TO ASSY DRG.		ITEM NO.	NO.OF ITEMS
CODE 405								
TITLE SPHERICAL DISH WITH 2:1 ELLIPSOIDAL DISHED END				CARD CODE	DRAWING NO. 4-163-10-00712			REV. 00
					SHEET NO 1			NO OF SHEETS 1

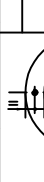


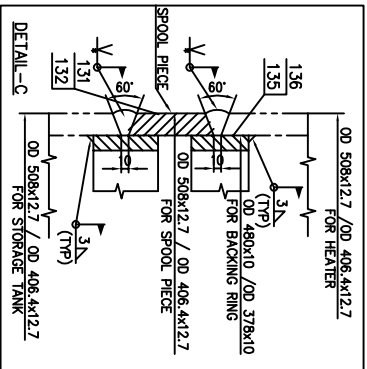
2082 FOR FIXED SUPPORT & 2067 FOR SLIDING SUPPORT, 15mm DIFFERENCE IN HEIGHT IS COMPENSATED BY TEFLON SHEET ASS'Y. (REFER DET-B).

POS. NOS. 5/7 FOR C3&C5, 142-143 APPLICABLE FOR C3,C5 NOZZLES.
POS. NO. 5/14 FOR C4&C6 NOZZLES.
PREFIX 1/, 2/, 3/ FOR POS. NOS. FOR SEC-I, II & III RESPECTIVELY, EXCEPT POS. NOS. 101-109, 131-143 & 161-167




IMPORTANT:-
SUBCONTRACTOR SHALL TAKE CONCURRENCE FROM ENGINEERING DEPT.
BEFORE MAKING ANY OPENINGS FOR NOZZLES ON THE SHELL & DISHED ENDS

WELDING DETAILS									
									
SHELL TO NOZZLE END CONNECTION									
REF.	DESCRIPTION	SIZE	OD x THK	TYPE	QTY	* AT SITE	REMARKS	QA #8	SHELL. VAR.
S1	FEEDWATER OUTLET CONN.	14"	335.60 x 12.7	BW	1	DET-032	DET-032	DET-05	372 600 S1 01
S2	OVER FLOW CONN.	3"	88.9 x 11.13	BW	1	DET-01	DET-01	DET-05	105 230 S2 02
S3	INITIAL HEATING STEAM CONN	6"	168.3 x 12.7	BW	1	DET-01	DET-01	DET-05	194 300 S3 03
S4	DRAIN	3"	88.9 x 11.13	BW	1	DET-02	DET-02	DET-05	105 230 S4 04
S5	VENTILATOR	6"	168.3 x 10.97	FLG 150#	REF 2	DET-04	DET-04		105 230 S5 05
S6	MAIN HOLE	20"	508.0 x 12.7	FLG 150#	REF 2	J-007/F	J-015/F		524 800 S6 06
S7	STAND PIPE CONN.	3"	88.9 x 11.13	FLG 150#	REF 4	DET-03	DET-03		105 230 S7 07
S8	SP-RATE CONN.	8"	219.1 x 12.7	BW	1	DET-01	DET-01		235 400 S8 08
S9	SAMPLING CONN.	1"	Coupling 6000#	SW	1	DET-06	DET-06	DET-031	59 09 S9 09
S10	DOSING CONN.	1"	Coupling 6000#	BW	2	DET-06	DET-06		510 10 S10 10
S13	BPR RECIRCULATION CONN.	6"	168.3 x 10.97	BW	2	DET-010	DET-010		164 300 S13 13
C1	DOWNCOMER CONN.	16"	406.4 x 12.7	BW	2	DET-01	DET-01	DET-05 / DET-C	422 600 C1 21
C2	DOWNCOMER CONN.	20"	508 x 12.7	BW	2	DET-01	DET-01	DET-05 / DET-C	524 760 C2 22
C3	PRESSURE GAUGE CONN	1 1/2"	48.3 x 7.14	FLG 300#	REF 1	DET-019	DET-019		194 300 C3 23
C4	THERMOWELL FOR TEMP GAUGE CONN	M3332	Coupling	SCOREWED	1	J-008/F	***		524 800 C4 24
C5	PRESSURE TRANSMITTER CONN.	1 1/2"	48.3 x 7.14	FLG 300#	REF 1	DET-019	DET-019		194 300 C5 25
C6	TEMPERATURE ELEMENT CONN	M3332	Coupling	SCOREWED	1	J-008/F	***		524 800 C6 26




* NOTES FOR LIST OF NOZZLE CONNL,
1) FOR DETAILS 1-001/F, J-002/F, J-007/F, J-008/F, J-015/F, J-017/F, J-021/F REFER DRG. NO. 2-163-10-00014
2) FOR DETAILS D1 TO D32 REFER DRG. NO. 1-163-10-1287
3) FOR DETAIL-B, C & D REFER THIS DRG.
** SW PIPE TO COUPLING AFTER REMOVING PLUG
*** SCREW PLUG WITH WASHER

[illegible]

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT										BHARAT HEAVY ELECTRICALS LTD. HYDERABAD									
TITLE	DEPT. - HEE	GRADE OF CULM. C/M		SCALE NTS	WEIGHT (KG)	DRAWING NO.	DRI.		NAME		1. STN.		DATE						
	CODE 405						CRD.	SRBRTA RAY	SRBRTA RAY	SRBRTA RAY	SRBRTA RAY	08.03.21	08.03.21	WAE					
							APRD.	SRBRTA RAY	SRBRTA RAY	SRBRTA RAY	SRBRTA RAY	08.03.21	MCOF. NO. N/A						
							REF. TO ASSY DRG.			N/A									
							DRAWING NO.			1-163-1-11492			REV. 00						
							SHEET No. 1			NO. OF SHEETS 1									

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY




	BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD	Customer: DCM SHRIRAM Project: DCM SHRIRAM-1x120 MW STG, Bharuch, Gujarat SO: M-AA-1024-001 WO: 1032419400	STANDARD QUALITY PLAN	QP No.: HYQA/SSMQP/HE/538/110	REV: 01
			EQUIPMENT: DEAERATOR	SHEET 1 OF 1	DT: 18.04.2020




Clarifications on customer comments:

S. No	Customer comments on rev 00	BHEL reply
1.	Include Heat Treatment for Shell Plates and Dished Ends.	<p>Shell Plates: Pls note these plates are supplied from Mills as rolled and normalised condition. These plates are Boiler Quality Plates of SA 516Gr70 /Eqvt. Mill TCs shall be furnished.</p> <p>Noted and included accordingly.</p> <p>Dished Ends: Dished Ends shall be formed from SA 516 Gr70 Plates and shall be supplied in Normalized condition after forming. Supplier TCs shall be furnished.</p> <p>Noted and included accordingly.</p>
2.	As per statutory requirements Deaerator shall be certified by Director of Boilers as per IBR.	<p>Noted. As per IBR Statutory requirements Deaerator shall be supplied under IBR regulations. Valid IBR forms shall be furnished.</p>

OK

OK

		BHARAT HEAVY ELECTRICALS LIMITED RAMACHANDRAPUR AM :: HYDERABAD		Customer: DCM SHRIRAM Project: DCM SHRIRAM-1x120 MW STG, Bharuch, Gujarat SO: M-AA-1024-001 WO: 1032419400										STANDARD QUALITY PLAN				QP NO. : HYQA/SSMQP/HE/538/110				REV: 01						
														EQUIPMENT : DEAERATOR				SHEET NO.: 1 OF 3				DATE: 18.04.2020						
LEGEND : A: By Supplier B: By B.H.E.L./BHEL appointed TPIA C: B & Customer/ Consultant D: Customer TPIA appointed by BHEL E: Customer appointed TPIA.			STAGES	CHEMICAL PROPERTIES	MECHANICAL PROPERTIES	COMPLIANCE CERTIFICATE	MATERIAL IDENTIFICATION	REVIEW OF TEST CERTIFICATES	WELDING PROCEDURE (REVIEW)	WELDER'S QUALIFICATION (REVIEW)	HEAT TREATMENT	RADIOGRAPHIC TEST	ULTRASONIC TEST	MAGNETIC PARTICLE INSPECTION	LIQUID PENETRANT INSPECTION	VISUAL EXAMINATION	DIMENSIONAL CHECK	HYDROSTATIC TEST	PNEUMATIC TEST (AIR LEAK)	EDDY CURRENT TEST /HYDRO	FIT UP	TUBE EXPANSION	FUNCTIONAL TEST	PAINTING	PERFORMANCE TEST	ROUTINE TEST	MECH. RUN TEST	
SL. No	NAME OF PART/ASSEMBLY																											
A. FEEDSTORAGE TANK																												
RAW MATERIAL & MAJOR BOIs (INSPECTION AT SUPPLIER'S WORK BY BHEL/BHEL TPIA)																												
1.	SHELL PLATES		A	A		B	B,C*			A					B	B												
2.	DISHED ENDS		A	A		B	B,C*			A	B6			B7	B	B												
3.	PADS: SUPPORT		A	A		B	B,C*								B	B												
4.	NOZZLE FLANGES(>4")		A	A		B	B,C*								B	B												
5.	NOZZLE PIPES (>4")		A	A		B	B,C*								B	B												
SHOP FABRICATION (INSPECTION AT BHEL SHOP)																												
6.	ASSEMBLY								B	B		B			B1	B, C*	B, C*	B2, C*	B4*		B			B				
NOTES: 1: 'PT' EXAMINATION ON ALL BACK CHIP JOINTS. 2: HYDRAULIC TEST AT SHOP / SITE AS PER DRAWING 3: 'PT' OF ALL BACK CHIP JOINTS. 4: AIR LEAK TEST OF RF PADS (SOAP SOL.TEST) IF APPLICABLE AS PER DRAWING 5: FITUP OF 'C' SEAMS & NOZZLE PIPES. 6: RT OF BUTT WELDS 7: ON KNUCKLE AREAS. * Test Reports / Supplier TCs, Inspection Report Shall be Included in QC Documentation. Supplier's TC for Raw Material and BOIs shall be offered for Review at BHEL Works during Hydro Test										PREPARED BY:  ALOK BEHERA DY.MGR / QA					APPROVED BY  B. ASHOK KUMAR AGM / QA					APPROVED BY : CUSTOMER /CONSULTANT								
In Case of any inconsistency between the requirements of Drawing. /Datasheet And QP, the Drawing /Datasheet will prevail.										ISSUED BY : QUALITY ASSURANCE DEPARTMENT																		

		BHARAT HEAVY ELECTRICALS LIMITED RAMACHANDRAPUR AM :: HYDERABAD		Customer: DCM SHRIRAM Project: DCM SHRIRAM-1x120 MW STG, Bharuch, Gujarat SO: M-AA-1024-001 WO: 1032419400										STANDARD QUALITY PLAN				QP NO. : HYQA/SSMQP/HE/538/110				REV: 00						
														EQUIPMENT : DEAERATOR				SHEET NO.: 2 OF 3				DATE: 05.03.2020						
LEGEND : A: By Supplier B: By B.H.E.L./BHEL appointed TPIA C: B & Customer/ Consultant D: Customer TPIA appointed by BHEL E: Customer appointed TPIA.			STAGES	CHEMICAL PROPERTIES	MECHANICAL PROPERTIES	COMPLIANCE CERTIFICATE	MATERIAL IDENTIFICATION	REVIEW OF TEST CERTIFICATES	WELDING PROCEDURE (REVIEW)	WELDER'S QUALIFICATION (REVIEW)	HEAT TREATMENT	RADIOGRAPHIC TEST	ULTRASONIC TEST	MAGNETIC PARTICLE INSPECTION	LIQUID PENETRANT INSPECTION	VISUAL EXAMINATION	DIMENSIONAL CHECK	HYDROSTATIC TEST	PNEUMATIC TEST (AIR LEAK)	EDDY CURRENT TEST /HYDRO	FIT UP	TUBE EXPANSION	FUNCTIONAL TEST	PAINTING	PERFORMANCE TEST	ROUTINE TEST	MECH. RUN TEST	
SL. No	NAME OF PART/ASSEMBLY																											
A. HEADER/DEAERATORHEATER																												
RAW MATERIAL & MAJOR BOIs (INSPECTION AT SUPPLIER'S WORK BY BHEL/BHEL TPIA)																												
1.	SHELL PLATES			A	A		B	B,C*			A					B	B											
2.	DISHED ENDS			A	A		B	B,C*			A				B7	B	B											
3.	PADS: SUPPORT			A	A		B	B,C*								B	B											
4.	NOZZLE FLANGES(>4")			A	A		B	B,C*								B	B											
5.	NOZZLE PIPES (>4")			A	A		B	B,C*						B		B	B											
SHOP FABRICATION (INSPECTION AT BHEL SHOP)																												
6.	ASSEMBLY									B	B		B			B3	B,C*	B,C*	B2,C*	B4*		B5			B			
NOTES: 1: 'PT' EXAMINATION ON ALL BACK CHIP JOINTS. 2: HYDRAULIC TEST AT SHOP / SITE AS PER DRAWING 3: 'PT' OF ALL BACK CHIP JOINTS. 4: AIR LEAK TEST OF RF PADS (SOAP SOL.TEST) IF APPLICABLE AS PER DRAWING 5: FITUP OF 'C' SEAMS & NOZZLE PIPES. 6: RT OF BUTT WELDS 7: ON KNUCKLE AREAS.											PREPARED BY:  ALOK BEHERA DY.MGR / QA				APPROVED BY  B. ASHOK KUMAR AGM / QA				APPROVED BY : CUSTOMER /CONSULTANT									
* Test Reports / Supplier TCs, Inspection Report Shall be Included in QC Documentation. Supplier's TC for Raw Material and BOIs shall be offered for Review at BHEL Works during Hydro Test In Case of any inconsistency between the requirements of Drawing. /Datasheet And QP, the Drawing /Datasheet will prevail.											ISSUED BY : QUALITY ASSURANCE DEPARTMENT																	



**BHARAT HEAVY
ELECTRICALS LIMITED
RAMACHANDRAPUR
AM :: HYDERABAD**

Customer: DCM SHRIRAM
Project: DCM SHRIRAM-1x120 MW STG, Bharuch, Gujarat
SO: M-AA-1024-001
WO: 1032419400

**STANDARD QUALITY
PLAN**

**EQUIPMENT :
DEAERATOR**

**QP NO. :
HYQA/SSMQP/HE/538/110**

SHEET NO.: 3 OF 3

REV: 00

DATE: 05.03.2020

IN PROCESS INSPECTION FOR SPRAY VALVES & TRAY ASSEMBLIES:

1. Closing Dished end shall be assembled only after assembly of Spray Valves and Tray assemblies.
2. Spray Valves are to be assembled prior to assembly of Trays.
3. QC to ensure welding of stoppers for hold down rods and assembly of hold down angles with cleats.
4. QC to ensure tack welding of double lock nuts for spray valve fixing to valve plate.
5. QC to ensure availability of split pin through the top locknut and stem of the spray valve before assembly of Spray valve.
6. QC to ensure positioning of split pin at the bottom of hold down rod during tray assembly

APPROVED

By DCM SHRIRAM at 2:55 pm, May 12, 2020

NOTES:

* Test Reports / Supplier TCs, Inspection Report Shall be Included in QC Documentation.
Supplier's TC for Raw Material and BOIs shall be offered for Review at BHEL Works during Hydro Test

In Case of any inconsistency between the requirements of Drawing. /Datasheet And QP, the Drawing /Datasheet will prevail.

PREPARED BY:

**ALOK BEHERA
DY.MGR / QA**


APPROVED BY

**B. ASHOK KUMAR
AGM / QA**

APPROVED BY :

CUSTOMER /CONSULTANT

ISSUED BY : QUALITY ASSURANCE DEPARTMENT

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD	MANUFACTURING QUALITY PLAN					CUSTOMER: NALCO DAMANJODI CONSULTANT: M/S DASTUR & COMPANY (P) LTD. PROJECT: NALCO Damanjodi-1x18.5 MW STG-UNIT-1 SO NO.: MFA1083001 WO NO.: W-1032419800 (FWD)					
			ITEM: DEAERATOR HEATER & FST MWD		QP No: Rev. No.: DATE: SHEET 1 of 6								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTU M OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										M	B	C	

RAW MATERIAL & MAJOR BOIs

1.0 A	INSPECTION AT SUPPLIER'S WORKS												
1.1	SHELL PLATES & PLATES FOR DISHED ENDS	A	CHEMICAL COMPOSITION	MAJOR	CHEMICAL	AS PER SPEC.	SA 516 Gr.70 AND BHEL SPEC	SUPPLIER TC		P			
		B	MECHANICAL PROPERTIES, HEAT TREATMENT	MAJOR	MECH,HT	AS PER SPEC.	SA 516 Gr.70 AND BHEL SPEC	SUPPLIER TC		P			
		C	ULTRASONIC EXAM	MAJOR	NDE	AS PER SPEC.	SA 435	SUPPLIER TC		P			
1.2	NOZZLE PIPES	A	CHEMICAL COMPOSITION	MAJOR	CHEMICAL	AS PER SPEC.	SA 106 Gr.B AND BHEL SPEC	SUPPLIER TC		P	V		
		B	MECHANICAL PROPERTIES, HEAT TREATMENT	MAJOR	MECH,HT	AS PER SPEC.	SA 106 Gr.B AND BHEL SPEC	SUPPLIER TC		P	V		
1.3	SPRAY VALVES	A	CHEMICAL COMPOSITION	MAJOR	CHEMICAL	AS PER SPEC.	SS 316 ,BHEL SPEC HE 51272	SUPPLIER TC		P	V		
		B	MECHANICAL PROPERTIES	MAJOR	MECH	AS PER SPEC.	SS 316 ,BHEL SPEC HE 51272	SUPPLIER TC		P	V		
		C	PERFORMANCE TEST FLOW VS PRESSURE DROP CHARACTERISTICS	MAJOR	PERFORMANCE	AS PER SPEC.	BHEL SPEC HE 51272	SUPPLIER TC		P	W		
1.4	SHELL DISHED ENDS	A	VERIFICATION CORRELATION OF MATL. SPECIFICATION & TC	MAJOR	VISUAL	100%	SA 516 Gr.70 AND BHEL SPEC ,DRAWING	SUPPLIER TC		P	V		
1.4	SHELL DISHED ENDS	B	DIMENSIONAL CONFORMITY AFTER FORMING INCLUDING MIN. THICKNESS MEASUREMENT.	MAJOR	MEASRT	100%	SA 516 Gr.70 AND BHEL SPEC ,DRAWING	SUPPLIER TC		P	V		
		C	PT ON KNUCKLE PORTION	MAJOR	NDE	100%	ASME SEC. V ART . 6/ASME SEC.VIII DIV.I APPX.8	SUPPLIER TC		P	V		

LEGEND:

M: MANUFACTURER / VENDOR B: BHEL /BHEL NOMINATED INSPECTION AGENCY, C:

CUSTOMER / CUSTOMER NOMINATED INSPECTION AGENCY.

P: PERFORM, W: WITNESS V: VERIFICATION, * D: RECORDS IDENTIFIED WITH TICK (✓) SHALL BE ESSENTIALLY INCLUDED IN QA DOCUMENTATION.


PREPARED BY:


REVIEWED BY:


APPROVED BY:

APPROVED BY:


CUSTOMER /
CONSULTANT

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD		MANUFACTURING QUALITY PLAN				CUSTOMER: NALCO DAMANJODI CONSULTANT: M/S DASTUR & COMPANY (P) LTD. PROJECT: NALCO Damanjodi-1x18.5 MW STG-UNIT-1 SO NO.: MFA1083001 WO NO.: W-1032419800 (FWD)						
				ITEM: DEAERATOR HEATER & FST MWD		QP No: Rev. No.: DATE: SHEET 2 of 6								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
											M	B	C	
		D	RT EXAM OF BUTT WELD JOINT	MAJOR	NDE	100%	DRAWING, ASME SEC. V ART. 2SEC.VIII DIV.I UW51/52	SUPPLIER TC			P	V		
		E	VERIFICATION OF HT CHART FOR STRESS RELIEVING/NORMALIZING AFTER FORMING	MAJOR	VISUAL	100%	SA 516 Gr.70 AND BHEL SPEC ,DRAWING , ASME SEC.VIII DIV. UCS 56	SUPPLIER TC			P	V		
		F	TESTING OF PRODUCTION TEST COUPON HEAT TREATED ALONG WITHDISHED ENDS.	MAJOR	VISUAL	100%	SA 516 GR. 70 &IBR Reg. 561	SUPPLIER TC			P	V		
1.5	TRAY ASSEMBLY	A	REVIEW OF MATERIAL COMPLIANCE TC	MAJOR	TC VERFN	100 %	DRAWING	SUPPLIER TC			P	V		
		B	DIMENSIONAL INSPN	MAJOR	MEASRT	AS PER SPEC	DRAWING	SUPPLIER TC			P	V		
1.0 B VERIFICATION OF RAW MATRIAL TCS/SUPPLIER TCS AT BHEL WORKS														
1.1	SHELL PLATES & PLATES FOR DISHED ENDS		AS PER CL 1.0 A 1.1	MAJOR	TC VERIFN	100 %	SA 516 Gr.70 AND BHEL SPEC ,DRAWING	SUPPLIER'S TC	✓		P	V		
1.3	NOZZLE PIPES		AS PER CL 1.0 A 1.3	MAJOR	TC VERIFN	100 %	SA 106 Gr.B AND BHEL SPEC ,DRAWING	SUPPLIER'S TC	✓		P	V		
1.4	SPRAY VALVES		AS PER CL 1.0 A 1.4	MAJOR	TC VERIFN	100 %	SS 316 ,BHEL SPEC HE 51272	SUPPLIER'S TC	✓		P	V		
1.5	SHELL DISHED ENDS		AS PER CL 1.0 A 1.5	MAJOR	TC VERIFN	100 %	SA 516 Gr.70 AND BHEL SPEC ,DRAWING	SUPPLIER'S TC	✓		P	V		
1.6	TRAY ASSEMBLY		AS PER CL 1.0 A 1.6	MAJOR	TC VERIFN	100 %	BHEL SPEC ,DRAWING	SUPPLIER'S TC	✓		P	V		
2.0 INPROCESS INSPECTION (INSPECTION AT BHEL WORKS)														
2.1 NOZZLE FABRICATION (HEATER & FST)														
2.1.1	NOZZLE FABRICATION	A	MATERIAL IDENTIFICAION & TC VERIFICATION FOR PLATES	MAJOR	VISUAL	100%	DRAWING. TC &SPEC	DRAWING. TC &SPEC	IR/ LOG RECORD		P	W		
LEGEND: M: MANUFACTURER / VENDOR B: BHEL /BHEL NOMMNATED INSPECTION AGENCY, C: CUSTOMER / CUSTOMER NOMINATED INSPECTION AGENCY. P: PERORM, W: WITNESS V: VERFICATION, * D: RECORDS IDENTIFIED WITH TICK (✓) SHALL BE ESSENTIALLY INCLUDED IN QA DOCUMENTATION.						PREPARED BY:		REVIEWED BY:		APPROVED BY:		APPROVED BY:		
												CUSTOMER / CONSULTANT		

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD		MANUFACTURING QUALITY PLAN				CUSTOMER: NALCO DAMANJODI CONSULTANT: M/S DASTUR & COMPANY (P) LTD. PROJECT: NALCO Damanjodi-1x18.5 MW STG-UNIT-1 SO NO.: MFA1083001 WO NO.: W-1032419800 (FWD)					
				ITEM: DEAERATOR HEATER & FST MWD		QP No: Rev. No.: DATE: SHEET 3 of 6							
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										M	B	C	
	(HEATER & FST)	B	FIT UP OF L SEAMS	MAJOR	VISUAL & MEASRT.	100%	DRG. ASME SEC. VIII DIV. I & IBR	DRG. ASME SEC. VIII DIV. I & IBR	IR/ LOG RECORD		P	V	
		C	RT OF L SEAM WELD	MAJOR	NDE	AS PER DRG	ASME SEC. V ART. 2 & IBR REG. 561	ASME SEC. VIII DIV I UW51 & IBR REG. 561	NDE REPORT	✓	P	V	V
		D	DIMENSIONAL CONFORMITY	MAJOR	MEASRT.	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V	
2.2	SHELL FABRICATION (HEATER & FST)												
2.2.1	SHELL FABRICATION	A	MATERIAL IDENTIFICAION & TC VERIFICATION FOR PLATES	MAJOR	VISUAL	100%	DRAWING. TC & SPEC	DRAWING. TC & SPEC	IR/ LOG RECORD		P	W	
		B	VISUAL INSPECTION OF PLATE & EDGE PREPARATION	MAJOR	VISUAL	100%	ASME SEC VIII DIV. I & IBR	ASME SEC VIII DIV. I & IBR	IR/ LOG RECORD		P	W	
		C	VERIFICATION OF APPROVED WPS, PQR & WQR	MAJOR	VISUAL	100%	AS PER ASME SEC. IX & IBR	AS PER ASME SEC. IX & IBR	IR/ LOG RECORD		P	V	
		D	FIT UP OF L & C SEAMS	MAJOR	VISUAL & MEASRT.	100%	DRG. ASME SEC. VIII DIV. I & IBR	DRG. ASME SEC. VIII DIV. I & IBR	IR/ LOG RECORD		P	V	
		E	PT EXAM. OF L & C SEAMS OF THE OUTER SHELL WELDS	MAJOR	NDE	100%	ASME SEC. V ART. 6	ASME SEC. VIII DIV. 1 APPX.8	NDE REPORT	✓	P	W	V
		F	RT OF WELDS – L SEAM , C SEAM	MAJOR	NDE	AS PER DRG	ASME SEC. V ART. 2 & IBR REG. 561	ASME SEC. VIII DIV I UW51 & IBR REG. 561	NDE REPORT	✓	P	V	V
		G	FIT UP OF NOZZLES TO SHELL	MAJOR	VISUAL & MEASRT.	100%	DRG.	DRG	IR/ LOG RECORD		P	V	
2.2.1	SHELL FABRICATION	H	PT / MT EXAM OF NOZZLE TO SHELL WELDS	MAJOR	NDE	100%	DRAWING & ASME SEC. V ART.6 /7	DRAWING & ASME SEC. VIII APPX. 8 / 6	NDE REPORT	✓	P	W	V
		I	DIMENSIONAL CONFORMITY OF SHELL ASSEMBLY.	MAJOR	MEASRT.	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V	
2.3	SADDLE FABRICATION, INTERNAL SUPPORT & TRAY ENCLOSURES												
2.3.1	SADDLE FABRICATION & INTERNAL SUPPORT & TRAY	A	FIT UP OF PADS & SADLE TO SHELL – HEATER & FST	MAJOR	VISUAL	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V	
		B	FIT UP OF INTERNAL CONNECTION -HEATER	MAJOR	VISUAL & MEASRT	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V	
LEGEND: M: MANUFACTURER / VENDOR B: BHEL /BHEL NOMMNATED INSPECTION AGENCY, C: CUSTOMER / CUSTOMER NOMINATED INSPECTION AGENCY. P: PERORM, W: WITNESS V: VERFICATION, * D: RECORDS IDENTIFIED WITH TICK (✓) SHALL BE ESSENTIALLY INCLUDED IN QA DOCUMENTATION.						PREPARED BY:	REVIEWED BY:	APPROVED BY:	APPROVED BY:				
									CUSTOMER / CONSULTANT				

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD		MANUFACTURING QUALITY PLAN				CUSTOMER: NALCO DAMANJODI CONSULTANT: M/S DASTUR & COMPANY (P) LTD. PROJECT: NALCO Damanjodi-1x18.5 MW STG-UNIT-1 SO NO.: MFA1083001 WO NO.: W-1032419800 (FWD)						
				ITEM: DEAERATOR HEATER & FST MWD		QP No: Rev. No.: DATE: SHEET 4 of 6								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
											M	B	C	
	ENCLOSURES	C	CHECK FOR CLEARANCE / FIT UP OF TRAY ENCLOSURES- HEATER	MAJOR	VISUAL & MEASRT.	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V		
		D	VISUAL & DIMENSIONAL EXAM OF TRAY ENCLOSURE-HEATER	MAJOR	VISUAL & MEASRT.	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	W		
		E	PT EXAM OF PADS & SADDLE SUPPORT WELDS-HEATER & FST	MAJOR	NDE	100%	ASME SEC. V ART. 6	ASME SEC. VIII DIV.I APPX. 8	IR/ LOG RECORD	✓	P	V	V	
2.4	FINAL ASSEMBLY - HEATER													
2.4.1	FINAL ASSEMBLY	A	CHECK FOR STACKING OF TRAYS	MAJOR	VISUAL	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V		
		B	VISUAL & DIMN. CHECK OF COMPLETE TRAY ASSEMBLIES	MAJOR	VISUAL & MEASRT.	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	W		
		C	MATCHING OF INTERCONNECTING NOZZLES OF FST AND DEAERATOR HEATER WITH FIXTURE	MAJOR	VISUAL	100%	DRAWING & FIXTURE	DRAWING. & FIXTURE	IR/ LOG RECORD	✓	P	W	V	
		D	FIT UP OF CLOSING DISHED END WITH SHELL	MAJOR	VISUAL & MEASRT	100%	DRAWING	DRAWING	IR/ LOG RECORD		P	V		
		E	RT OF CLOSING DISHED END TO SHELL JOINT	MAJOR	NDE	AS PER DRG	ASME SEC. V ART. 2 & IBR REG. 561	ASME SEC. VIII DIV I UW51 & IBR REG. 561	NDE REPORT	✓	P	V	V	
		F	SOAP SOLUTION TEST FOR RF PADS & SPHERICAL DISH – HEATER & FST	MAJOR	VISUAL	100%	HE-71022/01	HE-71022/01	IR/ LOG RECORD	✓	P	W	V	
2.4.1	FINAL ASSEMBLY	G	PWHT OF L CEAM, C SEAM JOINT- HEATER & FST(IF APPLICABLE)	MAJOR	HT	100%	DRAWING & IBR REG. 562	DRAWING & IBR REG. 562	HT REPORT	✓	P	V	V	
		I	VISUAL & DIMENSIONAL INSPECTION OF FINAL ASSEMBLY – HEATER & FST SECTIONS	MAJOR	VISUA, MEASRT	100%	DRAWING	DRAWING	IR / LOG RECORD	✓	P	V	V	
3.0	HYDRO TEST													
3.1.1	HYDRO TEST/ MARKING OF	A	HYDRO TEST OF DEAERATOR HEATER	CRITICAL	HYDRO	100%	DRG., HY0852061 & IBR REG. 601	DRG., HY0852061 & IBR REG. 601	HYDRO TEST REPORT	✓	P	W	W	

LEGEND: M: MANUFACTURER / VENDOR B: BHEL /BHEL NOMMNATED INSPECTION AGENCY, C: CUSTOMER / CUSTOMER NOMINATED INSPECTION AGENCY. P: PERORM, W: WITNESS V: VERFICATION, * D: RECORDS IDENTIFIED WITH TICK (✓) SHALL BE ESSENTIALLY INCLUDED IN QA DOCUMENTATION.				PREPARED BY:	REVIEWED BY:	APPROVED BY:	APPROVED BY:
							CUSTOMER / CONSULTANT

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD		MANUFACTURING QUALITY PLAN				CUSTOMER: NALCO DAMANJODI CONSULTANT: M/S DASTUR & COMPANY (P) LTD. PROJECT: NALCO Damanjodi-1x18.5 MW STG-UNIT-1 SO NO.: MFA1083001 WO NO.: W-1032419800 (FWD)						
				ITEM: DEAERATOR HEATER & FST MWD		QP No: Rev. No.: DATE: SHEET 5 of 6								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS		CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
											M	B	C	
	AXES	B	MARKING OF AXES ON ALL SECTIONS OF STORAGE TANK FOR SITE ASSEMBLY	CRITICAL	VISUAL & MEASRT.	-	DRAWING	DRAWING	IR/ LOG RECORD	✓	P	W	W	
4.0	PRE DISAPATCH INSPECTION													
4.1.1	PRE-DESPATCH INSPECTION	A	CLEANLINESS, COMPLETENESS, BLANKING OF ALL OPENINGS STAMPING/NAME PLATE.	MAJOR	VISUAL, MEASRT	100%	HE 71023		IR / LOG RECORD	✓	P	V		
		B	PAINTING	MAJOR	VISUAL, MEASRT	100%	DRG. / SPECN.	DRG. / SPECN.	IR / LOG RECORD	✓	P	V		

NOTES:

1. IN CASE OF ANY INCONSISTENCY BETWEEN QUALITY PLAN AND DRAWING/SPECIFICATION, THE LATTER SHALL PREVAIL.
2. ALL MATERIALS SHALL BE PROCURED AS PER BHEL SPECIFICATION/DRAWING/P.O


NOTES FOR FIXING TRAY ASSEMBLIES & SPRAY VALVES:

1. CLOSING DISHED END SHALL BE ASSEMBLED ONLY AFTER ASSEMBLY OF SPRAY VALVES AND TRAY ASSEMBLIES.
2. SPRAY VALVES ARE TO BE ASSEMBLED PRIOR TO ASSEMBLY OF TRAYS.
3. QC TO ENSURE WELDING OF STOPPERS FOR HOLD DOWN RODS AND ASSEMBLY OF HOLD DOWN ANGLES WITH CLEATS.
4. QC TO ENSURE TACK WELDING OF DOUBLE LOCK NUTS FOR SPRAY VALVE FIXING TO VALVE PLATE.
5. QC TO ENSURE AVAILABILITY OF SPLIT PIN THROUGH THE TOP LOCK NUT AND STEM OF THE SPRAY VALVE BEFORE ASSEMBLY OF SPRAY VALVE.
6. QC TO ENSURE POSITIONING OF SPLIT PIN AT THE BOTTOM OF HOLD DOWN ROD DURING TRAY ASSEMBLY

IBR REQUIREMENTS:

1. AS A STATUTORY REQUIREMENT, DESIGN, CONSTRUCTION AND TESTING SHALL BE AS PER IBR CODE REQUIREMENTS.
2. ALL RELAVANT IBR CERTIFIED TC SHALL BE FURNISHED ALONG WITH OTHER QC DOCUMENTATION AS PER QUALITY PLAN.

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				CUSTOMER / CONSULTANT

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD		MANUFACTURING QUALITY PLAN				CUSTOMER: NALCO DAMANJODI CONSULTANT: M/S DASTUR & COMPANY (P) LTD. PROJECT: NALCO Damanjodi-1x18.5 MW STG-UNIT-1 SO NO.: MFA1083001 WO NO.: W-1032419800 (FWD)					
				ITEM: DEAERATOR HEATER & FST MWD		QP No: Rev. No.: DATE: SHEET 6 of 6							
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										M	B	C	

GENERAL LEGENDS					
NDE	NON DESTRUCTIVE EXAMINATION	ASSLY	ASSEMBLY	CHEM	CHEMICAL
UT	ULTRASONIC TEST	QC	QUALITY CONTROL	MECH	MECHANICAL
PT	DYE PENETRANT TEST	TPIA	THIRD PARTY INSPECTION AGENCY	TC	TEST CERTIFICATES
MT/MPI	MAGNETIC PARTICLE INSPECTION	WPS	WELDING PROCEDURE SPECIFICATION	VERFN	VERIFICATION
RT	RADIOGRAPHY TEST	WQR	WELDER QUALIFICATION RECORD	IGC	INTER GRANULAR CORROSION
MEASRT	MEASUREMENT	PQR	PROCEDURE QUALIFICATION RECORD	HT	HEAT TREATMENT
DIMN	DIMENSION	IR	INSPECTION REPORT	QA	QUALITY ASSURANCE
REVISION HISTORY					
SL NO.	REVISION DETAILS	DATE OF REV	PREPARED BY	REVIEWED BY	APPROVED BY
1	FIRST ISSUE	25.01.2018	AB	DSS	DSS

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Format no. : HYQA/QP/MQP-1 Rev.00