

	PPX-BOI DEPARTMENT BHARAT HEAVY ELECTRICALS LIMITED HEEP: HARDWAR-249 403 (Uttarakhand) FAX: +91 1334 226084/226462 TEL: +91 1334 28 1690/1362	ENQUIRY NO. R/5599/2017/3162V/1 DATE OF ISSUE OF ENQUIRY: 16/10/2017 ENQUIRY DUE DATE: 06/11/2017 (BY 1345 HRS IST)
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INSTRUCTION TO BIDDERS & SPECIAL TERMS OF ENQUIRY

1. SCOPE OF ENQUIRY

Sealed Bids are invited from the bidders for the supply of the Packages as per requirement mentioned below:

Sl. No.	Material Code & Item Description	Qty.	Project	Delivery Date
1	D55995237160 PACKAGE-1: Environment Lab. Equipments for Bhadradi TPP, Telangana (As per list & details enclosed in Annexure-A)	1 Set	4 x 270 MW Bhadradi TPP (Telangana) project site	30/06/2018
2	D55995237390 PACKAGE-2: General Lab. Equipments for Bhadradi TPP, Telangana (As per list & details enclosed in Annexure-B)	1 Set		30/06/2018
3	D55995237250 PACKAGE-3: Equipment for Coal Analysis for Bhadradi TPP, Telangana (As per list & details enclosed in Annexure-C)	1 Set		30/06/2018
4	D55995237330 PACKAGE-4: Chemicals, Glasswares, Furniture, Safety and General Lab Requisites for Bhadradi TPP, Telangana (As per list & details enclosed in Annexure-D)	1 Set		30/06/2018

2. EARNEST MONEY DEPOSITE (EMD)

- 2.1 Interested vendors must submit their offer along with the following Earnest Money Deposit (EMD) in a separate sealed envelope:

Details	Amount In INR	Amount in Foreign Currency	Type
EMD	INR 2,00,000/- (INR Two Lacs only)	Equivalent amount	Refundable

- 2.2 EMD should be submitted in the form of demand draft/Pay Order/Cash (as permissible under Income Tax Act). The Drafts shall be drawn in favor of "BHEL Haridwar". In case of foreign bidders, E- payment is also acceptable. For E-Payment, the RTGS details are as mentioned below:

Bank Details	SWIFT Details of bank	Contact Details of Banker
STATE BANK OF INDIA RANIPUR BRANCH, OPP: BHEL MAIN GATE, SECTOR-5, RANIPUR, HARIDWAR, UTTRAKHAND, INDIA PIN CODE : 249403	SWIFT NO : SBININBB225 CC ACCOUNT NO : 10667995458 IFSC CODE : SBIN0000586	Name: Sh. Sudhir Sharma Design: Chief Manager (IBD) Contact No. +91 1334 224201 +91 1334 226125 Fax: +91 1334 226512

- 2.3 **MSE Suppliers / Central / State - PSUs / Government departments are exempted from submission of the EMD.**
- 2.4 Bids not accompanied with requisite EMD or bids accompanied with EMD of inadequate value shall not be considered for further evaluation.

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- 2.5 The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be refunded after the finalization of the contract. EMD shall be forfeited in the event of bidder opting out after tender opening (PART-I).

3. PRE-QUALIFICATION REQUIREMENT (PQR)

The Pre-Qualification Requirements have been compiled Package-wise and placed at **ANNEXURE-I**. All the bidders should ensure submission of complete details and documents as called for in the same. The offers submitted by the bidders would be scrutinized with respect to Pre-Qualification Requirements first. Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements.

4. TECHNICAL REQUIREMENT

Please quote your offer for the required Package/Packages as per BHEL Technical Specifications, Quality requirement and Approved vendors specified at **Annexure-A, Annexure-B, Annexure-C & Annexure-D** separately (**Enclosed as ANNEXURE-II**).

Bidder to quote each item of a Package separately as per specifications & corresponding approved vendors and also submit original catalogue of the each item issued by its Original Equipment Manufacturer (OEM) alongwith Technical bid. Failing this, the offer for the package is liable to be rejected.

Bidder shall ensure that supply of each item shall be made through approved vendors mentioned in its corresponding technical specifications. A certificate issued from approved vendor in this regard shall have to be submitted with offer for each item.

Vendors can participate in one or more packages provided they fulfill the requirements as per our specification and qualification criteria.

Bidder ensured that each page of the documents submitted with the offer/bid is signed and stamped by authorized representative.

5. SUBMISSION OF OFFER

- 5.1 Only English version of all documents would be valid & binding.
- 5.2 Bidders are advised to study all the tender documents carefully. Any submission of tender by the bidder shall be deemed to have been done after careful study and examination of the tender documents and with full understanding of the implications thereof. The specifications and terms & conditions shall be deemed to have been accepted unless otherwise specifically commented upon in 'Deviation' sheets by the bidder in his offer. Non-compliance with any of the requirements and instructions in the Tender Enquiry may result in rejection of the offer.
- 5.3 Name of vendor's dealing person with Contact No(s), Email ID and Address of correspondence shall be provided in the bid.
- 5.4 Tenders are to be submitted in Two (2) Parts and Part-I (Techno-Commercial Bid, as detailed below) will be opened first. The offers are to be submitted on or before the Due Date and time, as detailed below:

[A] PART-I: PRE-QUALIFICATION REQUIREMENT (PQR) & TECHNO-COMMERCIAL BID

Comprising of following documents:

- a. Earnest Money Deposit (EMD)/details of EMD in case of E-Payment.
- b. Bidders are required to furnish requisite details and supporting documents as specified in **Pre-Qualification Requirements (PQR)** for meeting the same. The package-wise Pre-Qualification requirements are enclosed as **ANNEXURE-I**.

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- c. Complete Technical offer with relevant document/catalogue etc. as per “**Technical Specifications: Annexure-A, Annexure-B, Annexure-C & Annexure-D**”, “**Standard Quality Plan (SQP)**” and “**Project Specific Terms & Conditions for Environmental Laboratory Equipment for 4 x 270 MW Bhadradi TPP (Annexure-1)**” which are enclosed as **ANNEXURE-II**.
- d. “**INSTRUCTION TO BIDDERS & SPECIAL TERMS OF ENQUIRY**” and “**GISTC (GENERAL INSTRUCTIONS AND STANDARD TERMS & CONDITIONS AGAINST TENDER ENQUIRY)**” are an integral part of this enquiry and endorsed copies of these documents (duly signed and stamped on each page, as a token of acceptance) are to be necessarily submitted along with the offer. Deviations if any are to be listed out separately.
- e. Commercial Terms & Conditions.
- f. Duly filled-in **Compliance Sheet** for Package-1, Package-2 & Package-3 enclosed as **ANNEXURE-III**.
- g. **Quality Assurance Plan (QAP)** of each item of quoted package (as per clause 15 of this document).
- h. List of imported items proposed to be supplied in the quoted package/s.
- i. Any Deviation with reference to technical requirements/specification to be laid down on separate sheet. Acceptance of such technical deviations would be at the discretion of BHEL.
- j. Un-Priced replica of Price Bid (Package-wise with each item).
- k. **Supplier Registration Form (SRF)**: Online Registration Portal is operational in BHEL. Bidders not registered at BHEL Haridwar, have to apply through Online Registration portal, <https://supplier.bhel.in/>. All credentials and/or documents duly signed and stamped related to registration has to be uploaded on the website and the application submitted for registration. One set of hard copy of the filled up Supplier Registration Form (SRF) downloaded from Online Registration Portal duly signed and stamped has to be submitted along with the offer.

Note: The SRF complete in all respects, should be submitted necessarily before price bid opening. The bidders registered at BHEL, Haridwar are exempted from submission of the SRF.

[B] PART-II: PRICE-BID

Containing **Prices of each item (separately) of the quoted Package/Packages** is to be submitted in original, strictly as per enquiry conditions for complete scope of tender enquiry.

- 5.5 Following shall be super scribed on the envelopes which shall be addressed by name and designation to the official inviting tender:

PART-I (refer clause 5.4 [A]) :

1. TENDER ENQUIRY NO. AND PACKAGE DESCRIPTION
2. DUE DATE FOR OPENING
3. "TECHNO-COMMERCIAL BID WITH PQR".

PART-II (refer clause 5.5 [B])

1. TENDER ENQUIRY NO AND PACKAGE DESCRIPTION
2. DUE DATE FOR OPENING
3. "PRICE BID".

- 5.6 Parts - I & II shall be submitted in separate sealed covers duly superscribed as indicated above and shall be enclosed further in a main cover duly sealed and superscribed as:
“OFFER FOR (PACKAGE NAME) AGAINST ENQUIRY NO. DUE ON CONTAINING PART-I & PART-II Bids”. Vendor’s full name and address should be clearly mentioned on the envelope.
- 5.7 Envelope not marked with tender enquiry number is liable to be ignored and may not be opened.

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- 5.8 Quotation must be enclosed in sealed cover on which tender enquiry number and the due date MUST BE written and be invariably sent under REGISTERED POST / SPEED POST / COURIER/Dropped in the Tender Box, addressed as follows:

To,

**THE HEAD OF MATERIAL MANAGEMENT,
Heavy Electrical Equipment Plant,
Bharat Heavy Electricals Limited,
HARIDWAR-249403 (Uttarakhand), INDIA.**

- 5.9 Tender opening is scheduled to start in the Tender Room at 2:00 PM (IST), on the due date. Therefore bid/quotations must reach this office / tender Box latest by 1:45 PM (IST) on due date. Only participating bidders are allowed to attend tender opening. TENDERS RECEIVED AFTER THE SPECIFIED TIME OF THEIR 'SUBMISSION' WILL BE TREATED AS LATE TENDERS AND SHALL NOT BE CONSIDERED UNDER ANY CIRCUMSTANCES.
- 5.10 The bid/quotation must be posted before due date, keeping allowance for postal transit time. Alternatively, the tenders duly sealed and super-scribed as above may be deposited in the Tender Box. Quotations sent by any mode but not received in time will be ignored. Tender received through authorized E-mail is also acceptable. However, in time submission of tender in tender box shall be the responsibility of the bidder, sent through any mode. Documents submitted with the offer/bid shall be signed and stamped in each page by authorized representative of the bidder.
- 5.11 **PART-I (Techno-Commercial bid with PQR)** will be opened on Due Date and time specified in the Enquiry, or extension thereof, in presence of tenderers who may like to attend. Incomplete offers are liable to be rejected.
- 5.12 **Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements mentioned in our Enquiry and who have submitted the EMD as stipulated in clause 3 above.**
- 5.13 After finalization of Techno-Commercial evaluation, offers of vendors who have qualified in techno-commercial offer shall be considered for Price Bid Opening/RA.
- 5.14 All correspondence thereof, shall be addressed to the following persons:

Mr. Gurdeep Singh Designation: Dy. Engineer (PPX-BOI) 4th Floor, Main Administrative Building HEEP, BHEL Hardwar- 249403 Uttarakhand, India Email ID: singhg@bhelhwr.co.in Tel: +91 1334 28 1690	Mr. Shailendra Kumar Designation: Sr. Manager (PPX-BOI) 4th Floor, Main Administrative Building HEEP, BHEL Hardwar- 249403 Uttarakhand, India Email ID: shail@bhelhwr.co.in Tel: +91 1334 28 1362
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- 5.15 Bidders shall be allowed in the tender room in area identified for bidders and only one authorized representative from each bidder shall be allowed.
- 5.16 Bidder shall not be allowed to carry camera/laptop in the tender room. The use of Mobile Phone is also restricted in the Tender Room.
- 5.17 Details of offers shall be read out to bidders and in no case the offers shall be handed over to any of the bidders for noting down.
- 5.18 As per directives of CENTRAL VIGILANCE COMMISSION, GOVERNMENT OF INDIA, one agent cannot represent two or more suppliers or quote on their behalf in a particular tender. If so found at any stage, BHEL Hardwar is likely to cancel Enquiries / POs to such suppliers. Further, such Indian Agent is likely to be de-listed (Black listed for business from BHEL).

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- 5.19 Vendors operating from BHEL quarters, unauthorized colonies on BHEL Land and Dharamshalas/ Hotels shall not be considered, hence such vendors need not apply.

6 RIGHT OF ACCEPTANCE

- 6.1 BHARAT HEAVY ELECTRICALS LIMITED HARIDWAR reserves the right to reject any or all the bids/quotations without assigning any reason thereof. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced quantity without any extra charges.
- 6.2 Any discount/ revised offer submitted by a bidder on its own shall be accepted provided it is received on or before the due date and time of offer/bid submission (Part-I). Conditional discounts shall not be considered for evaluation of tenders.
- 6.3 Unsolicited discounts/revised offers given after enquiry opening (i.e. Part-I bid opening) shall not be accepted.
- 6.4 In case there is no change in the technical scope and/or specifications and/or commercial terms & conditions, the bidder/s shall not be allowed to change his/their price bid after the due date (i.e. Part-I bid opening).
- 6.5 In case of changes in scope and/or technical specification and/or commercial terms & conditions, having price implications, techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid. A cut-off date and time shall be given to all the techno-commercially acceptable bidders to submit the impact on their price bids.
- 6.6 In the event of any bidder, after finalizing the technical specification & scope of supply, opting to revise and submit their latest price bid instead of submitting impact on their price bid asked by BHEL, then their latest price bid shall prevail. However in such condition their original price bid will necessarily be opened.
- 6.7 After technical & commercial examination of the offers received and clarifications obtained (if required), Part-II (Revised Price Bid/ Original Price Bid along with Price Impact and Discount, if any) shall be opened, for which the date and time shall be intimated to technically and commercially acceptable bidders in case of public opening. BHEL may opt to finalise the prices through Reverse Auction amongst technically and commercially acceptable bidders. BHEL reserves the right to open the earlier price bids, if any, submitted by the bidder(s), if required.
- 6.8 No correspondence shall be entertained from the tenderers after opening of Part-II (Price bid), except clarifications (if any) asked by BHEL in writing.

7 BASIS OF QUOTATION

For Supplies from outside India:

The prices are necessarily to be quoted on FCA as well as CFR Mumbai (India) basis.

For Supplies from within India:

The prices are to be quoted on Ex-Works with freight Pre-paid up to destination basis. The goods must be dispatched through any Bank approved transporters having their branch at Haridwar. The names and addresses of transporters approved by IBA as well as BHEL are posted at our website www.bhelhwr.co.in. Pls. note that, if you dispatch the material by any BHEL un-approved transporter then you will be required to

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furnish the MRC (Material Receipt Certificate) from Project Site for processing of your invoice. No demurrage charges would be borne by BHEL.

Vendors should quote inland freight charges (for supplies within India, if any). In case the offer is silent regarding inland freight charges, then, **the same would be considered to be inclusive in the offer.** In such case, no separate freight charges would be payable to the supplier (in the event of ordering) and transportation has to be arranged by supplier at their own cost.

8 OFFER VALIDITY

The offer is to be submitted with a validity of 180 days from the date of opening of techno-commercial offers (Part-I Offer). BHEL will reserve the right to reject the offer, quoting validity less than 180 days.

9 PRICES & PRICE SCHEDULE

- 9.1 **The prices are to be quoted on firm basis. BHEL will reserve the right to reject the offer of the vendors not quoting the prices on Firm basis.**
- 9.2 Bidder shall closely peruse all clauses & specifications etc. indicated in tender documents before quoting. In case of any doubt about meaning of any portion of tender specifications or discrepancies or omissions in tender document or clarifications regarding scope of work etc., the official(s) inviting the tender can be contacted for clarifications, before submitting the offer.
- 9.3 ***Bidder shall necessarily quote the prices of each individual item of the quoted package/packages separately in their Price bid.***
- 9.4 The prices for foreign scope of supply & services (i.e. from outside India) should be quoted in Euro/USD/JPY/UK Pound/ SF/Singapore Dollar or any other Internationally Freely Tradable Currency only.
- 9.5 In the Price Breakup source of billing, source country of supply, Currency of quotation, separate FOB & CFR Mumbai (India) Charges (for imported shipment) and rate of all applicable taxes & duties, should be clearly mentioned.
- 9.6 Transit Insurance (both Marine & Inland) would be arranged by BHEL.
- 9.7 Tenderer shall quote the rates in English language and international numerals only. Total Price shall be entered in figures as well as in words. All entries in the tender shall either be typed or written legibly in ink. Cancellations, corrections, insertions, erasures, over-writing (if unavoidable) shall be authenticated with signature and seal by the bidder.

10 APPLICABLE TAXES & DUTIES:

Details of applicable taxes & duties are to be mentioned as per clause 11 of General Instructions and Standards Terms & Conditions for bidding against tender enquiry (GISTC), Rev 01.

In this regard, following is to be specifically mentioned in the offer:

- a) GST Registration number
- b) Address of Principal place of Business
- c) Type of Business
- d) HSN code, its description & rate of applicable GST for the offered material.
- e) Whether registered under Composite Scheme of GST (Y/N)

It should be noted that the evaluation of the offers shall be done considering the taxation/benefit as applicable under GST.

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11 EVALUATION CRITERIA

- 11.1 Evaluation of the bids for decision of Lowest (L-1) bidder will be done Package-wise (Material Code wise) based on **Total Landed Cost to BHEL upto project site** (considering Total Material value for the package, Taxes & duties, Packing & Forwarding, Freight, Insurance, I&C charges and Commercial Loading, if any etc.).

Note: Bidders have to quote each item of the Package separately as mentioned in specifications failing to which the offer for the package is liable to be rejected.

- 11.2 Import Offers (supply portion offered on FCA as well as CFR Mumbai (India) basis) shall be loaded for Transit Insurance, Airport Handling/Clearing Charges, applicable custom duties for the project, freight element and other charges involved for delivery up to Project Site as following:
- o Transit Insurance - @ 0.01% of FCA value
 - o Airport handling/clearing charges - @ 1% of CIF value.
 - o Custom Duty (including GST): As prevailing on date of price bid opening.
 - o Inland Freight & Insurance (from Mumbai to project site): As per applicable rate of BHEL transportation contract/ standard practice at BHEL/GSTC, whichever is higher.
- 11.3 For evaluation (of offers quoted in Foreign Currency), Exchange Rate (TT selling rate of State Bank of India) as on date of tender opening (Part-I bid) shall be considered. If the relevant day happens to be a bank holiday, then the Forex rate as on the previous bank (SBI) working day shall be taken.

12 PAYMENT TERMS

12.1 STANDARD PAYMENT TERMS (For both Foreign & Indigenous Bidders):

Material Portion: 90% payment of Package Cost shall be made after receipt and acceptance of material at site and balance 10% payment after successful Installation & Commissioning of each item of Package at project site 'or' expiry of Warranty period, whichever is later.

Installation & Commissioning Portion: 100% payment against receipt of work completion certificate/successful commissioning certificate of each item of Package, signed by BHEL representative at site.

- 12.2 The payment may be claimed thru bank (i.e. CAD) or directly to BHEL. In case of payment through bank, all bank charges shall be on either side i.e. your bank's charges shall be to your account and our bank's charges shall be to our account. In case documents are presented directly to our nominated Banks, bank charges shall be to your account.
- 12.3 **For Foreign Bidders:** In case Bidders insists Payment thru Letter of Credit, BHEL may agree for Un-Confirmed and Irrevocable Letter of Credit and will; be opened 60 days prior to the scheduled delivery and will be valid for 90 days.
- 12.4 **For Indian Bidders:** Payment thru Letter of Credit (LC) will not be allowed. BHEL reserves the right to either reject the offer or load the offer of Indian bidders insisting payment thru LC.
- 12.5 **Loading for Deviation in Payment terms (for both Indian & Foreign Bidders):** BHEL reserves the right to load the offers of vendors for deviation in payment terms mentioned in the enquiry. Base rate of SBI (as on 31st March 2017) + 6% per annum, shall be considered for loading for the period of relaxation sought by bidders. Loading would be done on basic cost of items, as per table given below:

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Payment Terms		Days of Loading
After Receipt & Acceptance of material at Site (Indian/Foreign Bidders)		No Loading
Against Delivery at BHEL Site (against Material Receipt Certificate) (Indian/Foreign Bidders)		15
Against documents through bank (CAD):	Foreign Bidders	45
	Indian Bidders	30
Letter of Credit (LC)	Foreign Bidders	60
	Indian Bidders (if allowed under exceptional circumstances)	45
Usance LC	Foreign Bidders	No Loading if usance period is > 45 Days.
		Loading of days difference i.e difference between 45 days and usance period if the usance period is < 45 days
	Indian Bidders (if allowed under exceptional circumstances)	No Loading if usance period is > 60 Days.
		Loading of days difference i.e difference between 60 days and usance period if the usance period is <60 days

13 WARRANTY CLAUSE

- 13.1 The equipments shall be warranted as per 'Other Terms & Conditions' of Technical Specifications i.e. Annexure-A, Annexure-B, Annexure-C & Annexure-D.
- 13.2 Warranty of each item of the package should be extended by approved vendor. BHEL reserves the right to seek warranty also issued from OEM of the item for any item of the package at its discretion.
- 13.3 Shelf life of Solutions/Standards required for the item/items should be valid for at least 18 months from date of supply. Shelf life of these Solutions/Standards should also be indicated in the packing list submitted for issue of Material Dispatch Clearance Certificate (MDCC) by BHEL prior to dispatch of item.

14 INSTALLATION & COMMISSIONING

- 14.1 Please note that Installation & Commissioning of the equipments of quoted Package are required as per 'Other Terms & Conditions' of Technical Specifications i.e. Annexure-A, Annexure-B, Annexure-C & Annexure-D at **4 x 270 MW Bhadradri TPP** (Telangana) project site.

The following points are to be specifically taken care & confirmed regarding I&C while quoting offer:

- Installation & Commissioning (I&C) of item/items shall have to be carried out either by approved vendor himself or its duly authorized representative. Authorization in this regard shall also have to be submitted with the offer.
The entire responsibility of supply, I & C shall however remain with the bidder.
- The scope of I&C shall include receipt of items from BHEL's site store, transportation to required location (Laboratory Building) for installation/erection, operation, calibration with standards/solutions, training and demonstration to BHEL/Customer officials. The vendor shall

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arrange all the required tools & tackles/chemicals/glasswares/consumables/commissioning spares/supply cables or any other requisite for successful I&C, demonstration of equipment without any additional financial implication on BHEL.

- c) Construction of anchorage/pocket foundation/bolts/foundations etc. required for satisfactory I&C of all the items of the package including Coal Analysis items like Lab Pulveriser, Sieve Shaker, Jaw Crusher, Roll Crusher, Coal Sample Riffler, Abrasive/Erosive Index Machine, Laboratory Plate Mill, Laboratory Mini Mill etc. will be in the scope of vendor without any additional financial implication on BHEL.
- d) The vendor may visit the site/Laboratory building prior to taking up I&C of the equipments to make all necessary arrangement at his end. It shall be responsibility of the vendor to arrange and complete all the I&C and demonstration of all the items of the package in time bound manner through required one or more visits and to entire satisfaction of BHEL/BHEL's Customer as per BHEL specifications and contract conditions and also obtain unconditional handing over protocol for all the items in the package.
- e) Completion of I&C of the package shall be considered after receipt of unconditional handing over protocol of all the items of the package. No part completion of the package shall be considered for closure of I&C of the package for processing the balance payment.
- f) *Schedule of I&C of package shall be intimated by BHEL normally within 06 months from date of dispatch of package. I&C of the package shall have to be taken up promptly and completed within 08 weeks from date of issue of intimation for I&C. In case of delay in completion of I&C, a penalty of delay @ 1% of balance payment per week shall be imposed, subject to a maximum of 10 % of balance payment. The delay and applicable penalty shall be intimated in writing. In case of delay beyond 10 weeks, BHEL reserves the right to proceed and get the I&C done by alternate source at risk & cost to vendor without further intimation to vendor.*

- 14.2 *Kindly confirm that Lumpsum I&C charges (Package-wise) for complete scope of work for the quoted package (inclusive of everything i.e. conveyance, lodging and boarding etc. and irrespective of no. of man-days) has been quoted separately in your offer. These charges would be payable only after successful Installation & Commissioning of the equipment at site.
The above charges for Installation & commissioning shall be considered during Price evaluation.*

15 QUALITY REQUIREMENT AND INSPECTION & TESTING

- 15.1 Quality Assurance Plan (QAP) is to be submitted for each item of the package separately along with technical offer for approval of BHEL. Offers submitted without QAP are liable to be rejected.
- 15.2 For Quality Assurance Plan (QAP), a Standard Quality Plan (SQP) format is enclosed as a part of Annexure-II. Suppliers are requested to fill blank space of this format i.e. Item name, Project name, enquiry no., QP No. , Page details etc. in the SQP format. Suppliers shall submit separate QP for each item individually in line to prescribed format and submit with Part-1 of the tender enquiry.
- 15.3 The category of inspection of each item has been indicated in technical specification of the items. BHEL reserves the right to amend category of inspection as per project requirements.
- 15.4 The manufacturer shall conduct all routine/mandatory tests required to ensure that the equipment furnished conforms to the requirements of its specifications & approved QAP, applicable Codes and Standards.

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15.5 BHEL/BHEL's Customer/Nominated third party inspection agency may inspect items as per approved QAP/Technical Specifications. The vendor will provide all necessary support without any additional financial implication on BHEL.

16 O&M MANUAL REQUIREMENT

O&M Manual of the equipments shall be provided as per 'Other Terms & Conditions' of Technical Specifications i.e. Annexure-A, Annexure-B, Annexure-C & Annexure-D.

17 MATERIAL DISPATCH CLEARANCE CERTIFICATE (MDCC)

Material shall be dispatched only after issuance of Material dispatch clearance certificate (MDCC) by BHEL. For issuance of MDCC, you are required to submit the set of documents (i.e. Packing List, Test certificate, Calibration certificate & Guarantee certificate, as applicable) to BHEL in 15 days advance for review and release of MDCC by BHEL before dispatch of the consignment.

18 DELIVERY PERIOD

Material is required as per delivery schedule mentioned in the enquiry 'or' Intimation by BHEL, whichever is later. **However, you are requested to quote your best possible delivery period for the quoted Package (in totality) in number of weeks from the date of Intimation by BHEL.**

The following points are to be specifically taken care & confirmed regarding supply while quoting the offer:

- All the items in the Package would be required to be supplied in totality on intimation by BHEL.*
- The intimation for supply of the package will be issued by BHEL within one year from the date of placement of Purchase Order without any additional financial implication on BHEL.*
- Bidder shall ensure that supply of each item shall be made through approved vendors mentioned in its corresponding Technical Specifications. A certificate issued from approved vendor in this regard shall have to be submitted with offer for each item.*
- It shall be responsibility of vendor to handover all the items of the package to any of the BHEL approved transporters in time.*

19 PENALTY FOR LATE DELIVERY

- 19.1 In case of delay in supply of material beyond the agreed contractual delivery, Penalty for Late Delivery would be applicable @ 0.5% of the **total order value (Package-wise)** per week of delay or part thereof subject to a maximum of 10% of the **total order value (Package-wise)**.
- 19.2 For Supplies from outside India, the date of OBL (Original Bill of Lading)/ Air Way Bill (AWB) would be treated as the date of delivery for penalty purposes.
- 19.3 For Supplies within India, the date of GR (Goods Receipt)/ LR (Lorry Receipt) would be treated as the date of delivery for penalty purposes.
- 19.4 In case of dispatch thru BHEL un-approved transporter (for indigenous supplies), receipted GR/LR from Project Site would be required for processing of the invoice. In such case, no demurrage charges would be borne by BHEL.

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19.5 In case of any deviation to the above penalty clause, BHEL reserves the right to load the offers to the extent to which it is not agreed by vendors (at offered value).

20 REVERSE AUCTION

BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non- consideration of their bids, in case BHEL decides to go for RA.

In case BHEL decides to go for Reverse Auction, only those bidders who have given their unconditional acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit "Online sealed bid" in the Reverse Auction. Non-submission of "Online Sealed Bid" by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

Detailed terms and conditions for RA are enclosed (refer [Annexure-IV](#))

21 SETTLEMENT OF DISPUTES /ARBITRATION :

For Supplies from outside India:

Any dispute/difference arising out of or in connection with this contract, including any question regarding its existence, validity or termination, shall be referred to and finally resolved by arbitration under the Arbitration and Conciliation Act, 1996 of India or statutory modifications or reenactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under the clause. The seat or place of arbitration shall be Haridwar, India. The language to be used in the arbitration shall be English. The governing law of the contract shall be the substantive law of India.

JURIDICTION: The courts of Haridwar, India, shall have exclusive jurisdiction.

For Supplies from within India:

In case of dispute the matter shall be referred for ARBITRATION by sole arbitrator to be appointed by the Unit Head of Bharat Heavy Electricals Ltd., at HARIDWAR. The award of the Arbitrator shall be final and binding on both the parties. The place of Arbitration shall be Haridwar.

JURIDICTION: The courts of Haridwar, India, shall have exclusive jurisdiction.

BHEL reserves the right to reject the offer in case bidder does not agree to the arbitration clause.

22 RISK PURCHASE :

In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase

	PPX-BOI DEPARTMENT BHARAT HEAVY ELECTRICALS LIMITED HEEP: HARDWAR-249 403 (Uttarakhand) FAX: +91 1334 226084/226462 TEL: +91 1334 28 1690/1362	ENQUIRY NO. R/5599/2017/3162V/1 DATE OF ISSUE OF ENQUIRY: 16/10/2017 ENQUIRY DUE DATE: 06/11/2017 (BY 1345 HRS IST)
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Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract.

23 DEALING WITH BANNED SUPPLIERS/ CONTRACTORS IN BHEL

Offers of the bidders, who are on the banned list, as also the offers of the bidders who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com.

24 PRE-BID MEETING :

Pre-Bid clarifications & deviations (if any) should be sought within 10 days of issue of the enquiry. Bidders to compile all clarifications, if any, preferably in single communication. The clarifications would be provided within 3 days of receipt of queries. Bidders may also have across the table discussions for seeking pre-bid clarifications (if required).

25 IMPORTANT NOTE

INSTRUCTION TO BIDDERS & SPECIAL TERMS OF ENQUIRY are to be read along with GISTC (for both Foreign & Indian Bidders). A signed & stamped copy of these documents as a token of acceptance is to be submitted along with the offer. In the event of contradiction of terms and conditions mentioned, the order of preference shall be INSTRUCTION TO BIDDERS & SPECIAL TERMS OF ENQUIRY followed by GISTC (General Instructions and Standard Terms & Conditions against Tender Enquiry).

Kindly ensure the timely submission of your offer (by 1345 Hrs IST on the due date) and note that Late Offers shall not be entertained under any circumstances.

26 List of Enclosures

- i. INSTRUCTION TO BIDDERS & SPECIAL TERMS OF ENQUIRY
- ii. Pre-Qualification Requirements (**Annexure-I**) - No. of Pages: **04**
- iii. Technical Specifications, Standard Quality Plan (SQP) Format & Project Specific Terms & Conditions (**Annexure-II**) - No. of Pages: **47**
- iv. Compliance Sheets (**Annexure-III**) - No. of Pages: **37**
- v. Terms & Conditions of Reverse Auction (**Annexure-IV**) - No. of Pages: **01**
- vi. GISTC (For Foreign Bidders) - No. of Pages: **10**
- vii. GISTC (for Indigenous Bidders) - No. of Pages: **09**

For and on behalf of BHEL, Hardwar

(S K Baveja)
AGM-Incharge (PPX-BOI)

DETAIL OF ANNEXURE - I

PRE-QUALIFYING REQUIREMENT

Package-1 (Material Code: D55995237160)

No. of Pages = 1

PRE-QUALIFYING REQUIREMENT

Package-2 (Material Code: D55995237390)

No. of Pages = 1

PRE-QUALIFYING REQUIREMENT

Package-3 (Material Code: D55995237250)

No. of Pages = 1

PRE-QUALIFYING REQUIREMENT

Package-4 (Material Code: D55995237330)

No. of Pages = 1

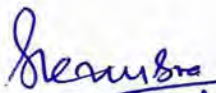
Total No. of Pages = 4

Pre – Qualifying Requirement (PQR)

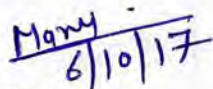
Package – 1 (Material Code : D55995237160)

Environment Lab Equipments for Bhadradi TPP

1. The average annual Turnover of the bidder for last three years (2014 – 15, 2015 – 16 and 2016 – 17) should not be less than Rs. 20 Lakh. Bidder have to submit Copies of supporting document (e.g. Trade accounts/Profit & loss accounts) for this.
2. The bidder should have supplied, installed & commissioned in India at least 10 items similar to the items listed in the package, against one or more orders placed on bidder within 05 years from the date of opening of tender. At least one Ion chromatograph and UV Visible Spectrophotometer each should necessarily be included in the specified 10 items. Bidder to submit true copies (unedited) of P.Os. and I & C reports.
3. The total value of purchase order/orders submitted against PQR 2 should not be less than Rs. 20 Lakh.


6/10/17

(S. K. Mishra)
Dy. Manager (PCRI)


(Manudev)
Engineer (PCRI)


6/10/17

(Dr. S. Bhatnagar)
SDGM (PCRI)

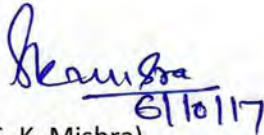

6/10/17

(Ambrish Goel)
AGM (PCRI-Labs)

Pre – Qualifying Requirement (PQR)

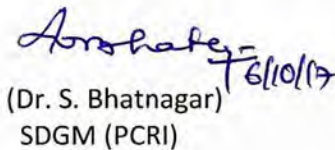
Package – 2 (Material Code : D55995237390)
Environmental Lab Equipments for Bhadradri

1. The average annual Turnover of the bidder for last three years (2014 – 15, 2015 – 16 and 2016 – 17) should not be less than Rs. 35 Lakh. Bidder have to submit Copies of supporting document (e.g. Trade accounts/Profit & loss accounts) for this.
2. The bidder should have supplied, installed & commissioned in India at least 14 items similar to the items listed in the package, against one or more orders placed on bidder within 05 years from the date of opening of tender. At least one Atomic Absorption Spectrophotometer and Gas Chromatograph each should necessarily be included in the specified 14 items. Bidder to submit true copies (unedited) of P.Os. and I & C reports.
3. The total value of purchase order/orders submitted against PQR 2 should not be less than Rs. 35 Lakh.

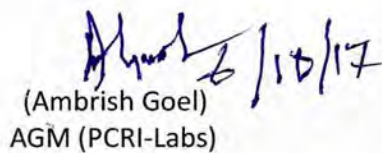


(S. K. Mishra)
Dy. Manager (PCRI)

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6/10/17
(Manudev)
Engineer (PCRI)



(Dr. S. Bhatnagar)
SDGM (PCRI)



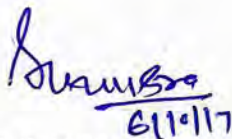
(Ambrish Goel)
AGM (PCRI-Labs)

Pre – Qualifying Requirement (PQR)

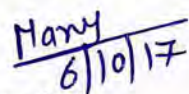
Package – 3 (Material Code : D55995237250)

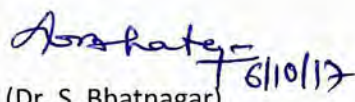
Environmental Lab Equipments for Bhadradi TPP (Equipments for Coal Analysis)

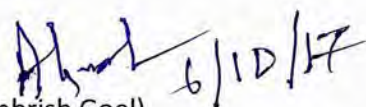
1. The average annual Turnover of the bidder for last three years (2014 – 15, 2015 – 16 and 2016 – 17) should not be less than Rs. 65 Lakh. Bidder have to submit Copies of supporting document (e.g. Trade accounts/Profit & loss accounts) for this.
2. The bidder should have supplied, installed & commissioned in India at least 09 items similar to the items listed in the package, against one or more orders placed on bidder within 05 years from the date of opening of tender. At least one Thermo Gravimetric Analyzer, Bomb Calorimeter and CHNS Analyzer each should necessarily be included in the specified 09 items. Bidder to submit true copies (unedited) of P.Os. and I & C reports.
3. The total value of purchase order/orders submitted against PQR 2 should not be less than Rs. 65 Lakh.


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(S. K. Mishra)
Dy. Manager (PCRI)


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(Manudev)
Engineer (PCRI)


6/10/17
(Dr. S. Bhatnagar)
SDGM (PCRI)

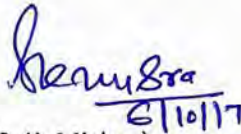

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(Ambrish Goel)
AGM (PCRI-Labs)

Pre – Qualifying Requirement (PQR)

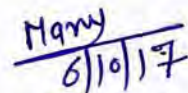
Package – 4 (Material Code : D55995237330)

Environmental Lab Equipments (Chemicals, Glassware, Furniture, Safety & Other General Lab. Requisites) for Bhadradri TPS

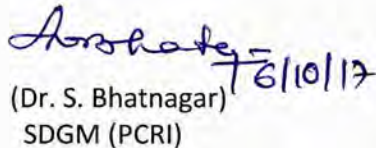
1. The average annual Turnover of the vendor for last three years (2014 – 15, 2015 – 16 and 2016 – 17) should not be less than Rs. 20 Lakh. Bidder have to submit Copies of supporting document (e.g. Trade accounts/Profit & loss accounts) for this.
2. The bidder should have supplied, installed & commissioned in India Chemicals, Glasswares and Furniture separately at minimum one laboratory against one or more orders placed on bidder within 05 years from the date of opening of tender.
3. The total value of purchase order/orders submitted against PQR 2 should not be less than Rs. 20 Lakh. Bidder to submit copies of unedited P.Os. for verification.



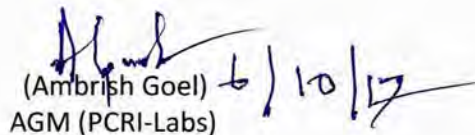
(S. K. Mishra)
Dy. Manager (PCRI)



(Manudev)
Engineer (PCRI)



(Dr. S. Bhatnagar)
SDGM (PCRI)



(Ambrish Goel)
AGM (PCRI-Labs)

CHEMICAL LAB EQUIPMENTS FOR 4 X 270 MW BHADRADI TPS PROJECT

ANNEXURE - II

INDENT NO. 20173162 DATED 06.10.2017

Annexure - A for Package - 1 [Material Code - D55995237160]

PACKAGE - 1: Environmental lab. Equipments for Bhadradi TPS Project (As per List & Details enclosed in Annexure-A)

	Item description	Quantity	Specification	Inspection Category	Accepted Vendors
1	Conductivity meter	2 No	A1	CAT-2	1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.
2	Conductivity meter (portable)	1 No	A2	CAT-2	1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.
3	pH meter	2 No	A3	CAT-2	1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.
4	pH meter (portable)	1 No	A4	CAT-2	1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.
5	Turbidity Meter	1 No	A5	CAT-2	1. Analytical Technologies Ltd. 2. Environmental & Scientific 3. Analytica Equipments(I) Pvt. Ltd 4. Orbit Technologies Pvt. Ltd.
6	Dissolved Oxygen meter(ppb level)	1 No	A6	CAT-2	1. Merck Specialist Pvt. Ltd, 2. Aaxis Nano Technologies 3. Analytical Technologies Ltd. 4. Orbit Technologies Pvt. Ltd. 5. Bibby Scientific Ltd.
7	Flame photometer	1 No	A7	CAT-1	1. Analytical Technologies Ltd. 2. Environmental & Scientific 3. Orbit Technologies Pvt. Ltd. 4. Bibby Scientific Ltd. 5. Usha Instruments & Chemicals
8	UV-VIS Spectro Photometer	1 No	A9	CAT-1	1. Orbit Technologies Pvt. Ltd. 2. Shimadzu (Asia Pacific) pvt. Ltd., 3. GBC Scientific Equipment Pvt. Ltd.

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9	DO meter	1 No	A8	CAT-2	1. Merck Specialist Pvt. Ltd, 2. Aaxis Nano Technologies 3 Analytica Equipments(I) Pvt. Ltd. 4. Orbit Technologies Pvt. Ltd. 5. Bibby Scientific Ltd.
10	Jar test apparatus	1 No.	A10	CAT-2	1. Testing instruments, 2. Aaxis Nano Technologies, 3. Divya Remedies, 4. Yorco Sales pvt ltd, 5. Macro scientific works, 6. Popular traders
11	Analytical Balance	1 No.	A11	CAT-2	1. Merck Specialist Pvt. Ltd, 2. Analytical Technologies Ltd. 3. CAS weighing India Pvt. Ltd, 4. Analytica Equipments (I) Pvt. Ltd, 5. Tula Digital (I) Pvt. Ltd, 6. Vortex Electronics Pvt. Ltd, 7. Avon Corporation Ltd, 8. Precisa Gravimetrics AG, 9. Shimadzu (Asia Pacific) PTE Ltd
12	Ion Chromatography	1 No.	A12	CAT-1	1. Metrohm 2. Thermo 3. Orbit Technologies
13	Weather monitoring station	1 No	A13	CAT-1	1. Virtual Hydromet Pvt Ltd. 2. Envirotech Instruments Pvt.Ltd. 3. Aimil Ltd. 4. Netel (India) Limited. 5. Novalynx 6. Orlab
14	Dew point Meter	1 No	A14	CAT-2	1. Endee 2. Virtual 3. Techmark 4. Orlab
15	Dial type barometer	1 No	A15	CAT-2	1. Wishwani scientific 2. Vikash Scientific 3. Popular 4. Reputed indigenous make
16	Maximum & minimum thermometer	2 Nos	A16	CAT-2	1. Wishwani scientific 2. Vikash Scientific 3. Popular 4. Reputed indigenous make
17	Dry & Wet bulb thermometer	2 Nos	A17	CAT-2	1. Wishwani scientific 2. Vikash Scientific 3. Popular 4. Reputed indigenous make
18	Stack monitoring kit	1 No	A18	CAT-2	1. Vayubodhan upkaran 2. Netel india ltd. 3. Polltech instruments

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ANNEXURE - II

19	Portable water quality analyzer	1 No	A19	CAT-2	1. Orbit technologies 2. Vortex electronics 3. Analytica Equipments
20	Auto clave	1 No	A20	CAT-2	1. Jain Scientific Glass Works. 2. Divya Remedies. 3. Yorco Sales Pvt. Ltd. 4. Narang Scientific Works Pvt. 5. Macro Scientific Works (Regd.). 6. Popular Traders.
21	BOD incubator	1 No	A21	CAT-2	1. Merck Specialities Pvt. Ltd. 2. Usha Instruments & Chemicals 3. Divya Remedies 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Vortex Electronics Pvt Limited. 8. Popular Traders. 9. Hindustan Apparatus Mfg. Co. 10. Orlab Instruments
22	COD reactor	1 No	A22	CAT-2	1. Merck Specialities Pvt. Ltd., 2. Jain Scientific Glass Works, 3. Spectralab Instruments Pvt., 4. Yorco Sales Pvt. Ltd., 5. Macro Scientific Works (Regd.) , 6. Orbit Technologies Pvt.Ltd., 7. Popular Traders, 8. Hindustan Apparatus Mfg. Co.
23	Inoculation chamber	1 No	A23	CAT-2	Reputed indigenous make

Inspection Category details:

CAT 1: Inspection by BHEL's customer [TSGENCO] (based on approved Quality Plan). BHEL MDCC shall be issued based on TSGENCO MDCC.

CAT 2: Inspection by BHEL / BHEL Third Party Inspection Agency. BHEL MDCC shall be issued based on TSGENCO MDCC.

Technical Specification of Items:

Mary
6/10/17

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6/10/17

A1 Conductivity meter

1.0 Name of Equipment : Bench Top Conductivity Meter

2.0 APPLICATION: Instrument is used for determination of conductivity, TDS, salinity, resistivity and temperature.

3.0 SPECIFICATIONS OF EQUIPMENT :

The Conductivity Meter with conductivity probe, conductivity standard and of following specifications should be provided.

1. Range : 0 to 1000 mS/cm with minimum low level measurement of 0.001 μ S/cm

2. Accuracy : 0.5% or better

3. Temperature compensation : Automatic

4. Display : Digital Display

5. Power Requirement : Mains operated (220 Volts AC $\pm$ 10%,
50 Hz $\pm$ 3%, single phase supply) / Battery operated

6. Standard Accessories :

1. Conductivity probe for low conductivity with Flow through vessel.

2. Electrode stand.

3. Conductivity standard of 100 μ S/cm

4. 1 No. spare cell

7. Detailed printed Catalogue must be provided along with the offer submitted.

A2 Conductivity meter (portable)

1.0 Name of Equipment : Portable Conductivity Meter

2.0 APPLICATION: Instrument is used for determination of conductivity, TDS, salinity, resistivity and temperature.

3.0 SPECIFICATIONS OF EQUIPMENT :

The Portable Conductivity Meter with conductivity probe, conductivity standard and of following specifications should be provided.

1. Range : 0 to 1000 mS/cm with minimum low level measurement of 0.001 μ S/cm

2. Accuracy : 0.5% or better

3. Temperature compensation : Automatic

4. Display : Digital Display

5. Power Requirement : Mains operated (220 Volts AC $\pm$ 10%,
50 Hz $\pm$ 3%, single phase supply) / Battery operated.

6. Standard Accessories : 1. Conductivity probe for low conductivity with Flow through vessel.

2. Conductivity standard of 100 μ S/cm

3. 1 No. spare cell

7. Detailed printed Catalogue must be provided along with the offer submitted.

A3 pH meter

1.0 Name of Equipment : Bench Top pH Meter Digital Type

2.0 APPLICATION: pH is a measurement of the acidity or alkalinity of substance (generally Liquid). pH Meter is required to measure pH of water and other liquid samples.

3.0 SPECIFICATIONS OF EQUIPMENT :

Portable pH meter with built-in NTC temp probe-single combination electrode with built-in temperature probe. The portable pH Meter should be of following specifications:

1. Range pH : 0 to 14

2. Accuracy pH : $\pm$ 0.01 pH

3. Temperature compensation : Automatic

4. Display : Digital Display

5. Input connections : pH Combination electrode with Temperature Sensor

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6. Power Requirement : Mains operated (220 Volts AC $\pm$ 10%,
50 Hz $\pm$ 3%, single phase supply) / Battery operated
7. Accessories : 1. Single combination electrode with inbuilt temp.probe
2. One spare pH electrode.
3. Electrode Stand
4. Buffer Tablets / Solutions (4, 7 & 10 pH) - 1 Pack of 100 Nos. or 1.0 Litre Solution of eachpH
5. Electrode filling solution
6. Dust Cover
7. Guide to pH measurement
8. Detailed printed Catalogue must be provided along with the offer submitted.

A4 Portable pH meter

1.0 Name of Equipment : Portable pH Meter Digital Type

2.0 APPLICATION: pH is a measurement of the acidity or alkalinity of substance (generally Liquid). pH Meter is required to measure pH of water and other liquid samples.

3.0 SPECIFICATIONS OF EQUIPMENT :

Portable pH meter with built-in NTC temp probe-single combination electrode with built-in temperature probe. The portable pH Meter should be of following specifications:

1. Range pH : -2 to 19.9
2. Accuracy pH : $\pm$ 0.01 pH
3. Temperature compensation : Automatic
4. Display : Digital Display
5. Input connections : pH Combination electrode with Temperature Sensor
6. Power Requirement : Mains operated (220 Volts AC $\pm$ 10%,
50 Hz $\pm$ 3%, single phase supply) / Battery operated
7. Accessories : 1. Single combination electrode with inbuilt temp. probe
2. Electrode filling solution
3. One spare pH electrode.
4. Buffer Tablets / Solutions (4, 7 & 10 pH) - 1 Pack of 100 Nos. or 1.0 Litre Solution of each pH)
5. Carrying Case
6. Batteries
7. Instruction Manual
8. Detailed printed Catalogue must be provided along with the offer submitted

A5 Turbidity Meter

1.0 Name of Equipment : Turbidity Meter

2.0 APPLICATION: The turbidity meter is used for determination of Turbidity in water samples.

3.0 SPECIFICATIONS OF EQUIPMENT :

Turbidity meter shall be a microprocessor based instrument for measuring turbidity. Instrument shall have Auto Ranging from 0 to 1000 NTU. Instrument senses turbidity level of sample and automatically adjusts to the appropriate measurement. Instrument shall have a facility for Auto Alert Calibration Prompt: Automatically prompts the operator when calibration of the instrument is needed. It shall have Simple Calibration Procedures: Calibration initiated with the push of a button ensures accurate readings.

Mary
6/10/17

Seema
6/10/17

Turbidity meter shall have infrared lamp source for colored samples measurement. Instrument shall meet international standard ISO 7027 for turbidity measurement.

Turbidity meter shall have resolution of 0.01 NTU at low turbidity readings and an extended range to 1,000 NTU.

Turbidity meter shall be delivered along with the following accessories:

Calibration Standards (0.02, 10 and 100 NTU).

Two measuring cuvettes with light shield caps (1 Set)

Operator's manual (1 Nos.)

Plug-in power adapter (1 No.)

Detailed printed Catalogue must be provided along with the offer submitted.

A6 Dissolved Oxygen Analyzer (ppb level)

1.0 Name of Equipment : Dissolved Oxygen Analyzer (ppb level)

2.0 APPLICATION: Equipment is required to measure dissolved oxygen in ppb levels for Boiler/DM/Condensate water.

3.0 SPECIFICATIONS OF EQUIPMENT :

Dissolved Oxygen Meter should be microprocessor-based, with the following specification :

1. Range : 1 ppb to 20 ppm
2. Accuracy : $\pm 1.5\%$ of reading or ± 0.2 ppb
3. Temperature range : 0.0 to 50.0 $^{\circ}\text{C}$
4. Probe : Dissolved Oxygen Probe with Cable
5. Power Requirement : Mains operated (220 Volts AC $\pm 10\%$, 50 Hz $\pm 3\%$, single phase supply) / Battery operated.
6. Standard Accessories :
 1. Dissolved Oxygen probe
 2. Flow through cell
 3. Battery
 4. Support stand

7. Detailed printed Catalogue must be provided along with the offer submitted.

A7 Flame Photometer for Water Analysis

Range- 0 to 199.9. Working range Na 0.5-10 ppm, Ca 3 – 40 ppm, K 0.75-25 ppm, Reproducibility:1% CV for 20 consecutive samples using 10 ppm Na set to 50 scale reading, linearity: Better than 2% when Na & K are 3 ppm, & are set to 100 scale reading, Specificity: interference from Na, K equal in concentration to test of element will be less than 0.5%, Recorder output : nominal 1.00 V for a reading of 100.0 K standard solution, Na standard solution, Ca standard solution, regulator for natural gas, Air compressor 220V.

8A Dissolved Oxygen Meter

1.0 Name of Equipment : Dissolved Oxygen Meter

2.0 APPLICATION: Equipment is required to measure dissolved oxygen in water.

3.0 SPECIFICATIONS OF EQUIPMENT :

Dissolved Oxygen Meter should be with the following specification :

1. Dissolved oxygen meter with barometric pressure/automatic temperature compensation, salinity correction, point calibration, with digital LCD display. Battery cum mains operated.
2. Range: 0-20 mg/L with high sensitivity membrane.
3. Accuracy: $\pm 0.5\%$ of the value, Operating temp.: -5 to 50 $^{\circ}\text{C}$, Protection waterproof.
4. Essential/Standard Accessories including DO Electrode, Output Cable & Instruction Manual.
5. Detailed printed Catalogue must be provided along with the offer submitted.

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A9 UV-VIS Spectro Photometer

1.0 Name of Equipment: UV-VISIBLE Spectrophotometer

2.0 General: Preprogrammed UV Visible Spectrophotometer with a unique combination for fast, accurate and precise measurements of Water Quality parameters and Spectral Analysis with the following specifications

3.0 Specifications of Equipment:

1. Wavelength Range : 190 - 1100 nm
2. Monochromator type : Grating monochromator with step motor
3. Spectral Bandwidth : 4nm
4. Wavelength Reproducibility : ± 0.5 nm (shall be checkable, with holmium Oxide filter)
5. Lamp type : Xenon Flash lamp with approx. 10 years Lamp life.
6. Photometric measuring range : ± 3.3 A Photometric resolution: $\Delta A = 0.001$
7. Photometric linearity : $< 1\%$ for $A < 2.000$ in the range 340 to 900nm
8. Photometric Accuracy (in the range 200 to 1000nm) : 0.003 A for $A < 0.600$ 0.5% of the reading for $0.600 < A < 2.000$
9. Photometric Reproducibility (in the range 200 to 1000nm) : ± 0.002 at $A = 1.000$ Scattered Light: $< 0.1\%$ transmission at 340 and 408 nm.
10. In built Cell adaptability : Automatic cell reorganization facility
11. Password protection for user management
12. Methods and profiles Over 100 water analysis methods, 100 user defined methods, 20 Profiles each for kinetics and spectra.
13. Measuring modes : concentration, Absorbance, % transmission, Multi-wavelength Storage for 1000 values for spectra and kinetics approx. 4 MB, e.g. 100 spectra (300-900 nm) and 400 kinetics with 150 values Updates via Internet and USB-Stick
14. Interfaces : 1 USB-A, 1 USB-B, 1 RS232 for Data transfer to PC and Printer and Data transfer from PC.
15. Analytical Quality Assurance : AQA support of standard parameters
16. Ambient Condition : Equipment shall be suitable for operation ambient temperature from 0-50°C and Relative humidity of 0-98%.
17. Spectrophotometer shall be supplied with 10, 20, 50 mm glass cells and pour through cell along with reagents for silica, Iron, copper, phosphate for 1000 test each parameter.

A10 Jar Test Apparatus

This shall be suitable for continuous run in a laboratory. Illuminator base shall consist of fluorescent tube mounted below translucent plastic plate to provide diffused cold light through floc samples. The Jar tester shall consist of geared continuous run heavy duty 1/20 HP variable speed motor from 10 to 100 rpm with built in speed control. Stainless steel stirring rods (6 nos.) shall be provided with adjustable spacers to adjust the depth of stirring paddles. The stirring shaft shall be removed without disturbing other stirrers. The unit shall be supplied complete with breakers.

6 No Jars, Jar Capacity : 1 liter

A11 Analytical Balance

Analytical Balance with metal housing to protect weighing cell and electronics, compact design, brilliant backlit display. The balances shall have automatic calibration with internal weight and it shall be possible to calibrate with external weights also.

Weighing range	220 gms
Readability	0.0001 g
Linearity	0.0002 g

A12 Ion Chromatograph

Ion Chromatography System to analyse various Anions like Cl^- , F^- , Br^- , BrO_3^- , NO_2^- , NO_3^- , PO_4^{3-} , SO_4^{2-} , ClO_4^- , ClO_3^- etc. Organic acids, Cations like Na^+ , K^+ , Li^+ , NH_4^+ , Ca^{2+} , Mg^{2+} and amines etc.

1) Solvent Delivery Pump: Non metallic PEEK based 0-14 pH & 100% Reverse phase HPLC solvent compatible, isocratic, dual piston reciprocating microprocessor based controlled for flow range of 5ml/min in 0.01 increment with pressure pulsation: $< 1\%$ & flow precision: $< 0.2\%$, operating pressure: 0-4500 psi or more. Fully controlled by Chromatography software.

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- 2) System will consist of column heater or shall have heater field up-gradation capability in future. The column heater will operate over the range of 30 to 60 °C with an accuracy of ± 0.5 °C at 40 °C.
- 3) IC system will be inert having non-metallic PEEK (polyetheretherketone) fluidic components throughout the system to ensure solvent compatibility and metal contamination-free chromatography.
- 4) Pump will have Vacuum degasser or the provision for add on optional Vacuum degasser.
- 5) Suppressor will be operated continuously. Suppressor regeneration will be carried out either chemically or electrolytically.
- 6) Suppressor will have capacity to suppress for Carbonate and Bicarbonate eluent or Hydroxide eluents. CO₂ removal device will be provided along with suppressor to minimize the background conductivity for anion analysis in case of Carbonate and Bicarbonate eluent chemistry. Cation analysis shall be performed using suppressor or non-suppressed mode.
- 7) Conductivity detector microprocessor digital signal processing based with 0-13000 μ S or more Digital & Analog output with 0.1nS resolution and noise: ± 0.1 nS with temperature compensation and temperature range of 7 to 55 °C with 0.01 °C accuracy.
- 8) License version of Chromatography software to control complete IC system, data acquisition, processing & reporting, etc. The software will be able to provide full automatic control of the process of analyzing samples.
- 9) Auto sampler (Optional): Automated sample for loading of samples having a capacity of 50 Poly vials of 5ml or 0.5 ml vial size or better. Variable volume injection for 0.1 ml to 5.0 ml or better. All Autosampler vials should be closely covered in sampler by Autosampler cover to avoid environmental and light effect.

It should be transfer data into computer/laptop

A13 Weather monitoring station

Weather monitoring station including wind speed sensor, wind direction sensor, rainfall sensor, relative humidity and temperature sensor.

Weather monitoring station shall be supplied with data logger, Data reporting software, PC and printer.

1. APPLICATION : Measurement of meteorological parameters in ambient atmosphere at Pre-defined intervals, storage and display of meteorological data.
2. TECHNICAL SPECIFICATION : Weather monitoring station comprising of following:
 - 2.1 WIND SPEED SENSOR:
 - 2.1.1 Measuring Range : 0-50 m/s
 - 2.1.2 Resolution: 0.1 m/s
 - 2.2 WIND DIRECTION SENSOR:
 - 2.2.1 Measuring Range : 0 to 360 degree angle
 - 2.2.2 Resolution: 2 degree
 - 2.3 AMBIENT TEMPERATURE SENSOR:
 - 2.3.1 Measuring Range : -20 to 70 degree centigrade
 - 2.3.2 Resolution: 0.5 degree centigrade
 - 2.4 RELATIVE HUMIDITY SENSOR :
 - 2.4.1 Measuring Range : 0 - 100% RH
 - 2.4.2 Resolution : 1°C
 - 2.5 RAINFALL SENSOR :
 - 2.5.1 Sensor: Tripping bucket Rain gauge sensor
 - 2.5.2 Measuring Range : 0 to 999.9 mm
 - 2.5.3 Resolution : 1 mm
 - 2.6 SOLAR RADIATION:
 - 2.6.1 Measuring Range : 0 to 1300 W/m²
 - 2.6.2 Resolution : 1 W/m²

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2.7 DATALOGGER: Data logger having 8 sensor channels and 8 digital channels, upto 256 KB memory capacity with-buffer battery power supply through built in 12 V/6.5 Ah, Real time clock with calendar and Liquid Crystal Display for instantaneous values of wind speed, direction, RH, Solar radiation and temperature, data readout through memory card and RS232 interface.

2.8 SOFTWARE : Suitable software package for data transfer to computer, measured value acquisition, graphical presentation system for meteorological data including preparation of wind roses.

2.9 MOUNTING ACCESSORIES: Tripod stand with provision of mounting all sensors with fittings and connecting cable of approximate length of 10 mt from sensors to data logger.

2.10 CONSTANT VOLTAGE TRANSFORMER : Suitable constant voltage transformer for stabilized voltage (230 V AC, 50 Hz) to the weather station.

2.11 COMPASS : Standard magnetic compass for setting direction of Wind direction sensor.

2.12 AMBIENT CONDITION : Equipment shall be suitable for operation in ambient temperature from 0 to 50 degree Celsius and relative humidity of 0 to 98%.

A14 Portable Dew Point Meter.

Dew point range : - 60 to 0 deg C

Sensor Type: Capacitance thin film polymer sensor

Indication: Digital

DESCRIPTION

1.1 TECHNICAL SPECIFICATIONS :

Range	: (-) 60 °C to 0 °C
Resolution	: ± 0.1 °C
Maximum Operating Pressure	: 1 bar
Accuracy	: ± 2 deg C Dew point
Sensor Connection	: Internal Sensor Connection required with the Dew point meter
Calibration	: Calibration will be manual
Sensor	: Capacitance thin film polymer Sensor
Indication	: Digital
Power supply	: 230 V AC
Cabinet	: Table mount with carrying case

A15 Dial Type Barometer

Dial Diameter: 100 mm

A16 Maximum & Minimum Thermometer

The thermometer shall register both maximum and minimum temperature. Range: -40°C to +50 °C

A17 Dry & Wet bulb Thermometer

This shall be mercury filled wet and dry Bulb thermometers mounted on scales with amended graduations in 2 °C intervals. Nominal range 10 °C to 50 °C. Hand blown glass cistern. Overall dimensions 108 mm width x 225 mm high, with holes for wall mounting along with wick and booklet of relative humidity tables.

A18 Stack monitoring kit

Stack monitoring kit for iso-kinetic sampling consisting of control, flow totaliser module (dry gas meter), impinger and condenser module, pitot tube and other accessories.

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SPECIFICATION OF EQUIPMENT:

Stack monitoring Kit as per IS 11255, consisting of :-

1. Instrument Panel with fibre cover consisting of thermocouple, inclined cum vertical manometer, stop watch, rotameters, Cold Box Assembly.
2. Vacuum Pump Assembly
3. Probe Set consisting of probe pipe, pitot tube, thermocouple, filter holder, interconnecting hose pipes, nozzles .etc.
4. Dry Gas Meter

Technical Specifications:

1. Stack Temperature Range: Ambient to 600 Deg C.
2. Stack Velocity Range: 0-50 m/sec
3. Particulate sampling: 10– 60 lpm
4. Gaseous sampling: 1-2 lpm in a of Borosilicate glass impingers.
5. Digital Temperature Indicator : 0-600 deg. C
6. Thermocouple : Thermocouple sensor in SS casing, Length of insertion 1 m with 2m long cable
7. Pitot Tube : S-type pitot tube fabricated from SS, 1.5 m in length
8. Rotameter: Rotameter with 2% FSD accuracy, 0-60 lpm for Particulates and 0.6-5 lpm for gases
9. Differential Density Manometer Assembly
10. Extension Vacuum Hose Pipe, 10 m long
11. Sampling Probes: Made from SS, 1.5m length
12. Filter Holder: Fabricated from SS suitable to hold either cellulose filtration thimble (size-28mm ID & 100mm long) or glass micro fibre, thimble (Size-19mmID, 90 mm long)
13. Whatman Cellulose Thimble (size-28mm ID & 100mm long) – 1 pkt. with kit
- Nozzles: A set of 3 SS nozzles (1/4, 3/8, 1/2 inch)
15. Digital Clock: 0-60 minutes, 1 second, readout with start and stop watches.
16. Sampling Train: 5 borosilicate glass impingers of 250 ml cap., accommodated in cold box .

14.

A19 Portable water quality analyzer

Portable water quality analyzer for measuring pH, ORP, ION, conductivity, TDS, salinity, dissolved oxygen, Turbidity and temperature in water and waste water samples.

It shall have large backlit Liquid crystal display.

Instrument shall have below technical requirement

pH Range	: 0.00 -14.00,
Accuracy	: ± 0.1 pH
ORP Range	: 1000 to +1000 mV,
Accuracy	: ± 1 mV
Dissolved oxygen Range	: 0.00 to 20.00 mg/L, Accuracy: ± 0.1 mg/L
Saturation measuring range	: 0.0 to 200 %, Accuracy: $\pm 1\%$
Conductivity measuring range	: 0 μ s/cm to 200 ms/cm,
Accuracy	: $\pm 1\%$ full scale
TDS Range	: 0 to 20 ppt
Turbidity	: 0 to 1000 NTU
Accuracy	: <5% of the Full scale NTU.

Instrument shall be supplied with pH/ORP probe, Conductivity probe, and Dissolved oxygen probe, Turbidity measuring devise, short instruction manual, standard solutions and carry case.

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ANNEXURE - II**A20 Autoclave**

1.0 GENERAL : autoclave is required for sterilization & preparation of Culture media for microbiological tests.

2.0 SPECIFICATION OF EQUIPMENT :

2.1. The Autoclave should be double wall construction with boiler made of stainless steel 16 gauge sheets.

2.2. The Autoclave should be 50 liters capacity approximately.

2.3. There should be mineral wool/glass wool insulation between Boiler and outer shell.

2.4. Lid should be made of thick stainless steel plate and tightened all – around by radial locking / wing nut arrangement.

2.5. There should be joint less gaskets made of neoprene rubber.

2.6 This sterilizer should be hydraulically tested upto 40 psi.

2.7 Sterilizer should be fitted with arrangement to indicate water level inside the boiler.

2.8 Pressure gauge, air/Steam release cock and double safety valves should be provided.

There should be Immersion type heating element of adequate wattage to achieve desired temperature and pressure. Stainless Steel basket should be provided.

A21 BOD incubator

Temperature range: 5 °C to 50 °C Temp Stability: ± 2 °C

Power: 230 V, 50 Hz, and 2.5 Amps

It shall be provided with a double walled clear see-through door for visual inspection of the samples without opening the door.

Thermostatically Controlled BOD Incubator of Volume 230 Ltrs.(approx.)

A22 COD Reactor

COD reactor/digester to be used to for the sample digestion for the measurement of COD and all other thermal digestion processes.

Reactor shall be dry temperature control device with safety cover and Cell shafts 12 cell shafts for reaction cells 16 ± 0.2 mm.

Reaction time setting 20 min, 30 min, 60 min, 120 min (via fixed programs) Temperature setting 100 °C, 120 °C, 148 °C and 150 °C via fixed programs Controlling accuracy ± 1 °C ± 1 Digit

Temperature stability ± 0.5 K

Over temperature protection 190 °C ± 5 °C

Heating time (with empty thermo block) from

· 25 °C to 100 °C approx. 5 min

· 120 °C approx. 7 min

· 148 °C approx. 10 min

Digestion unit shall come along with the following accessories and reagents: cuvettes Pk/25 empty digestion vessels. 250 tests reagents for up to 1500 ppm COD.

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A23 Inoculation Chamber**SPECIFICATION OF EQUIPMENT :**

1. The Inoculation chamber should be Vertical laminar flow cabinet with 100% exhaust system, suitable for exhaust duct upto 6 ft. to throw the contaminated air from the work area into the atmosphere outside the room.
2. The size (working size) of the Inoculation chamber should be approx. 3 x 2 x 2 ft.
3. A plenum should be provided under the S.S. perforated working table, with exhaust system which should work in coordination with the main air flow system.
4. The whole cabinet should be made out of stainless steel.
5. The side panels should be made of thick transparent plexi glass duly framed.
6. The unit should be fitted pre-filter and HEPA filter so that air is drawn through pre-filter and is made to pass through highly effective HEPA filter, thus retaining all air-borne particles of size 0.3 micron and larger.
7. The air should flow down vertically from top towards the work table.
8. HEPA filter and virus burn out should also be provided at the exhaust.
9. The unit should be fitted with duly balanced, direct drive motor blower units sized to provide adequate air flow volume over the entire surface of HEPA filter. It should be fitted with reputed make motor which should operate with minimum noise level.
10. The unit should be complete with S.S. Table Top, Transparent front door (5 mm), Static Pressure Inclined Manometer, Built in U.V. Germicidal Light and cock for gas.
11. The work area should be properly illuminated by diffused, glare free fluorescent light fitted to the unit.
12. The number, location, rating and make of motor / motors being used in the equipment should be indicated in the offer.
13. The equipment should work on 230 Volts AC, 50 Hz single phase supply.
14. The following spare accessories should be quoted
 - HEPA Filter
 - Pre Filter

Other Terms & Conditions

Document: One hard copy of O&M Manual in English language giving complete technical information for operation and maintenance of the equipment.

Installation and Commissioning: The supplier shall install & commission the equipment at site. Supplier should demonstrate the performance of the Equipment and all its accessories to ensure compliance with complete specifications & parameters quoted by them to the satisfaction of BHEL/end user. Cost of installation & Commissioning, if any, should be indicated separately. Training to chemists at site during installation should be provided for routine maintenance, operation and safety purpose. Failing to comply to the Installation and Commissioning clause, the offer will be rejected straightaway.

Warranty: The equipment shall be warranted for satisfactory performance for a period of 12 months from the date of installation or 18 months from date of dispatch, whichever is later. Failing to comply to the warranty clause, the offer will be rejected straightaway.

Packing & Dispatch: The equipment / accessories shall be packed in a suitable water proof/vibration proof packing box capable of bearing air and road transit hazards. Packing box shall be properly identified and marked with BHEL's (India) Purchase Order Number. Also, "PCRI HWR" should be written in bold letters on all four sides of the packing box.

The Project Specific Terms and Conditions Annexed at Annexure-1 are also to be read in conjunction with this document.

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(Manudev)
Engineer
Initiated by

S K Mishra
6/10/17

(S K Mishra)
Dy Manager
Checked by

S Bhatnagar
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(Dr. S Bhatnagar)
SDGM
Supervised by

Ambrish Goel
6/10/17

(Ambrish Goel)
AGM
Approved by

CHEMICAL LAB EQUIPMENTS FOR 4 X 270 MW BHADRADI TPS PROJECT**ANNEXURE - II**

INDENT NO. 20173162 DATED 06.10.2017

Annexure - B for Package - 2 [Material Code - D55995237390]**PACKAGE - 2: General lab. Equipments for Bhadradi TPS Project (As per List & Details enclosed in Annexure-B)**

Sl. No.	Item	Quantity	Specification [Annexured]	Inspection Category	Approved Vendors
1	Apparatus for oxidation stability test	1 No	B1	CAT-2	1. Culture Instruments. 2. Hindustan apparatus 3. Equivalent Vendor
2	Red wood viscometer for oil analysis	1 No	B2	CAT-2	1.Hindustan Apparatus Mfg. Co. 2 .Petroleum Instruments 3.Divya Remedies 4. Popular traders
3	Interfacial tension apparatus	1 No	B3	CAT-2	1. Culture Instruments 2. Equivalent Vendor
4	Automatic flash point apparatus	1 No	B4	CAT-2	1. Divya Remedies. 2. Yorco Sales Pvt. Ltd. 3. Macro Scientific Works (Regd.). 4. Popular Traders. 5. Hindustan Apparatus Mfg. Co.
5	Penetrometer for grease testing	1 No	B5	CAT-2	1. Petroleum Instruments (India) Pvt. Ltd., 2. Equivalent Vendor
6	Dean & Stark moisture determination apparatus	2 Nos	B6	CAT-2	1. Reputed Indigenous make
7	Explosimeter	1 No	B7	CAT-1	1. Endee 2. Equivalent Vendor
8	Centrifuge	1 No	B8	CAT-2	1. Usha Instruments & Chemicals. 2. Divya Remedies. 3. Yorco Sales Pvt. Ltd. 4. Macro Scientific Works (Regd.). 5. Vortex Electronics Pvt Limited. 6. Popular Traders. 7. Remi
9	Automatic K-F (Karl-Fisher) titrimeter	1 No	B9	CAT-2	1. Merck Specialities Pvt. Ltd. 2. Labindia Instruments Pvt. Ltd. 3. Toshniwal Instruments Manufact. 4. Analytica Equipments(I) Pvt. L. 5. Spectralab Instruments Pvt. 6. Orbit Technologies Pvt.Ltd. 7. Metrohm Ag.
10	Gas Chromatograph	1 No	B10	CAT-1	1. Aimil 2. Shimadzu 3. Thermo
11	Orsat Apparatus	1 No	B11	CAT-2	1. Jain Scientific Glass Works. 2. Vikas Scientific Works. 3. Divya Remedies. 4. Popular Traders. 5. Labco
12	Hydrogen purity apparatus	1 No	B12	CAT-2	1. Yokogawa India Limited. 2. Honeywell Automation India. 3. Endee 4. Nova analytical limited
13	Laboratory TOC analyzer	1 No	B13	CAT-1	1. Shimadzu 2. Ol analytics 3. Star 4. Orbit technologies

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14	Flue gas analyzer	1 No	B14	CAT-2	ANNEXURE - II 1. Aimil Ltd. 2. Orbit Technologies Pvt.Ltd. 3. Kane International Ltd. 4. Mru Gmbh. 5. Endee 6. Testo
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ANNEXURE - II

15	Oil content analyzer	1 No	B15	CAT-2	1. Horriba ltd. 2. Turner design, USA 3. Orbit technologies
16	Atomic absorption spectrophotometer	1 No	B16	CAT-2	1. Perkin elmer 2. Thermo 3. GBC scientific 4. Orbit technologies
17	Constant temperature bath	1 No	B17	CAT-2	Reputed indigenous make
18	Water distillation assembly	1 No	B18	CAT-2	Reputed indigenous make
19	Vacuum pressure pump	1 No	B19	CAT-2	1. Usha 2. Divya 3. Macro 4. Popular
20	Heating mantel	1 No	B20	CAT-2	1. Divya 2. Yorco 3. Macro 4. Popular 5. Hindustan
21	Magnetic stirrer cum hot plate	1 No	B21	CAT-2	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
22	Refrigerator	02 nos	B22	CAT-2	Reputed indigenous make
23	Hot plate	2 Nos.	B23	CAT-2	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
24	Magnetic stirrer	1 No	B24	CAT-2	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
25	Kipps apparatus	1 No	B25	CAT-2	1. Borosil glass works 2. Wishwani 3. Jain scientific 4. Galaxy Trading Corporation
26	Photometer	1 No	B26	CAT-2	1. Orlab 2. Reputed imported make
27	Potentiometric titration apparatus	1 No	B27	CAT-2	1. Merck Specialities Pvt. Ltd. 2. Analytica Equipments(I) Pvt. L. 3. Spectralab Instruments Pvt. 4. Orbit Technologies Pvt.Ltd. 5. Metrohm Ag. 6. Equivalent
28	Gas heating assembly	1 No	B28	CAT-2	Reputed indigenous make
29	Stop watch	1 No	B29	CAT-2	Reputed indigenous make

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ANNEXURE - II**Inspection Category details:**

CAT 1: Inspection by BHEL's customer [TSGENCO] (based on approved Quality Plan). BHEL MDCC shall be issued based on TSGENCO MDCC.

CAT 2: Inspection by BHEL / BHEL Third Party Inspection Agency. BHEL MDCC shall be issued based on TSGENCO MDCC.

Technical Specification of Items:**B1 Apparatus for oxidation stability test**

Test Capacity: 4 oxidation cells

Temperature Range: ambient to 100°C

Temperature Control Stability: 0.1°C

Bath Medium: white technical oil

Electrical Requirements : Operation on 230V AC

B2 Red wood viscometer for oil analysis

A standard viscometer in which the viscosity is determined by the time, in seconds, certain quantity of liquid to pass out through the orifice under given conditions; used for determining viscosities of fuel oils.

According to IP 70 USED OR DETERMINATION OF VISCOSITY OF LUBRICATING OILS AND FUELS WITH STAINLESS STEEL JET : 1.0 Viscosity below 2000 secs 2.0 Electrically heated model with control (Voltage varrier copper type) 3.0 Spare receiving flask (50 ml) 4.0 Thermometer for Redwood (with Calibration Certificate) *I.P 8C (0/45 X 0.2 C) *I.P. 9C (40/85C X 0.2C) 5.0 Calibration certificates of the thermometer should be supplied along with the equipment

B3 Interfacial tension apparatus

250mm borosilicate glass capillary tube

Engraved graduations

Graduated from 0 to 10cm, in 1mm divisions

Cork holds capillary tube inside outer tube

Outer tube accommodates rubber tubing

B4 Automatic Flashpoint Apparatus

The apparatus is microprocessor controlled fully automatic to determine the closed cup flashpoint ensuring accurate and repeatable measurement. Automatic correction of flash point per actual barometric pressure shall have electric and gas igniters, Temperature range: 79 to 400° deg C.

1. APPLICATION: Automatic measurement of Flash Point of oil and lubricants.

2. TECHNICAL SPECIFICATION :

2.1 MEASURING RANGE : 15°C to 370 °C

2.2 FLASH POINT DETECTION : Differential thermocouple/ionization.

2.3 STIRRING SPEED : 120 & 250 rpm

2.4 TEMPERATURE CONTROL: Programmable, software for temperature control.

2.5 CORRECTIONS: Automatic correction of flash point, as per actual barometric pressure.

2.6 OPERATION: Micro processor controlled, 14 pre-programmed test methods, programmable library for the user with suitable software support for easy to operate .

2.7 ENCASMENT : Encasement/cabinet of Corrosion resistant stainless steel material.

2.8 POWER SUPPLY : 230 V , 50 Hz.

2.9 DATA OUTPUT : RS 232 interface.

2.10 AMBIENT CONDITION : Equipment shall be suitable for operation in ambient temperature from 0 to 50 degree Celsius and relative humidity of 0 to 98%

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B5 Penetrometer for grease testing

Test Method Compliance ASTM D217 IP 50 ISO 2137 FTM 791-373

AUTOMATIC GREASE WORKER

Power supply 230V $\pm$ 10% 50Hz

Power 800W

Weight 37 kg

Dimensions 41x30x50 cm

AUTOMATIC GREASE WORKER 2 POSITIONS

Power supply 230V $\pm$ 10% 50Hz

B6 Dean & Stark Apparatus

Dean & stark app. for estimation of moisture in lubricating oils as per IP-74, ASTM D 95. The apparatus shall consist of receiver 10ml graduated, with 19/26 outer joint and 24/29 inner joint, round bottom flask 1000ml with 24/29 outer joint and liebig condenser 200 mm with 19/26 joint.

B7 Explosimeter

An explosimeter is a device which is used to measure the amount of combustible gases present in a sample. When a percentage of the lower explosive limit (LEL) of an atmosphere is exceeded, an alarm signal on the instrument is activated.

The device, also called a combustible gas detector, operates on the principle of resistance proportional to heat—a wire is heated, and a sample of the gas is introduced to the hot wire. Combustible gases burn in the presence of the hot wire, thus increasing the resistance and disturbing a Wheatstone bridge, which gives the reading. All standard accessories required for proper operation shall be supplied along with the instrument

Gas To Be Detected : All Explosive Gases

Range : 0 to 100% LEL

Detection Principle: Catalytic Pellister

Display: LCD

Battery : Rechargeable Battery

Battery Operating Time : 3 Hours

Temperature : -10 to 50 Deg C

Alarm : Audible & Visual

Warm up time : 10 Sec

B8 Centrifuge for Oil Analysis

The driving motor and the centrifuge chamber have been specially designed to suit the hazardous requirements of oil centrifuge application. These units are equipped with a Stepless speed regulator, Safety Lid interlock to prevent cover opening during centrifugation, Digital speed meter and 0-60 minutes digital countdown timer, Dynamic break for quick deceleration, Imbalance detector with cut off.

Max. Speed: rpm: 5250, No. of tubes: 4. each tube shall have a capacity of 100 ml and shall be of glass.

B9 Coulometric K.F. Titrator for Oil Analysis

Coulometric Karl Fischer Titrator for measuring moisture content in Transformer oil, lube oil in ppm range. Measuring range: 5 ppm to 5%

Principle of measurement: Coulometric method The instrument should be supplied with Titration cell with all necessary small parts for mounting and putting into operation like tubes, septum, gasket etc. double platinum pin electrode, Magnetic stirring bar, Magnetic stirrer motor, Brown glass bottle 1 L molecular sieve, Pump unit, Drying tube with cover, Syringe with injection needle, Operation instructions 1 liter of reagent suitable for operation should be supplied along with instrument

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ANNEXURE - II

1.0 Name of Equipment: Karl-Fisher Titrator

2.0 General: The instrument is used for measurement of moisture in oil.

3.0 Specifications of Equipment:

1. Type : Microprocessor Based Digital Automatic Karl Fischer Titration Apparatus (Coulometric)
2. Suitability : Suitable for estimating very minute traces of moisture in samples such as Transformer Oils / Insulating Oils & Petrochemical Products
3. Method : Coulometric Karl-Fisher Titration
4. Moisture Measuring Range : upto 10 mg
5. Readability : 0.001 mg
6. Accuracy : 0.01 mg (Highest Accuracy with simple operation)
7. Display Format : Liquid Crystal Display in ppm (mg/Kg)
8. Printer : Printer Port provided to connect printer
9. Power Supply : 230V AC, 50Hz
10. Serial Interface : RS 232 port
11. It shall have coulometric cell without diaphragm, constant current pulse time control by microprocessor, AC polarization end detection with electronic sound.
12. The equipment shall have facility to compensate drift automatically and independent memory literation conditions and calculation formula.
13. The instrument shall have facility to connect to printer/computer and balances separately along with in-built clock calendar.
14. Essential/Standard Accessories and spares should be included along with Built-in magnetic stirrer, Titration cell (200 ml), Reagent for Coulometric KF Titration and Water Standard.

B10 Gas Chromatograph

Complete Gas chromatography (GC) system for measuring dissolved gases in transformer oil. GC shall consist of Oven, FID, TCD detectors, gas extraction system, methanizer and other accessories required for dissolved gas analysis.

Instrument shall be supplied with calibration gas standards, PC and printer.

1. GC Controller : Microprocessor Based Gas Chromatograph with Data Processor, Digital Pressure and flow control for carrier gas, along with auto leak check facility in the digital measurement through hardware complete with necessary standard accessories.
- Column Oven
2. Temperature Range : Ambient - 400°C
3. Oven Capacity : 15 - 25 litres
4. Temperature Deviation : 2°C maximum
5. Temperature variation coefficient : 0.01°C/°C
6. Temperature program steps : Up to 20 (cooling program possible)
7. Programmed rate setting range : -250°C ~250°C/min
8. Total time for all steps : 9999.99 minutes max.
9. Linear heating rate : 30°C/min upto 150°C; 20°C/min upto 250°C
10°C/min upto 380°C; 7°C/min upto 400°C
10. Cooling Rate : 250°C or 300°C to 50°C in 6 or 7 mins
11. Columns : Capillary columns: 2; Packed columns: 2
Sample Injection Unit
12. Temperature Range : Up to 400°C
14. Heating Settings : 1°C steps
15. Number of units that can be installed : Up to Three simultaneously

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ANNEXURE - II

16. Type : Dual packed, single capillary injection- Split/splitless
(Compatibility to complete range of capillary columns)
Carrier Gas flow Controller
17. Range : 0-100 ml/min
18. Steps : 6 or 7
- Thermal Conductivity Detector (TCD) and FID Detector System
19. Temperature Range : 400°C
20. The chromatograph shall be equipped with Column Oven, Sample Injection unit, Carrier gas flow controller, Thermal Conductivity Detector System (TCD) and FID Detector System for both capillary & packed column.
21. Suitable Capillary and packed column as per application to be provided.
22. Filled Nitrogen gas cylinder (99.9 % pure, 7-8 cu.m.), Hydrogen gas cylinder (99.9 %, 7cu.m.) and Zero Air cylinder along with double stage regulators with gas purification panel and colour coded pressure tubings should be supplied from reliable/standard Indian source.
23. Standards for calibration of TCD and FID Detector System.
24. Computer System : Branded PC of reputable Indian manufacturer with printer with compatible software alongwith 5 KVA online UPS with 30 minutes backup.
25. All essential accessories required for the operation of the Gas Chromatograph should be quoted.

B11 Orsat Apparatus

For measurement of carbon dioxide, carbon monoxide & oxygen in furnace flue gases; the apparatus shall include:-

- (a) Three test gas manifold & rubber bellow - 1Nos
- (b) Three Absorption pipette with fitted glass tubes shall be having total filling capacity 250ml (appr.) & have fine glass tubes for CO₂ & O₂ absorption pipette whereas for CO these tubes shall have copper wire with glass tubes
- (c) Gas burette complete with outer water jacket, capacity 100ml with bulb at top-1 No
- (d) Leveling bottle cap. - 250 ml-1Nos

The above items shall be fitted in Good quality wooden cabinet with front & rear sliding doors with lifting handle-1Nos

Accessories

- (a) Three test manifold & rubber bellow - 3 Nos
- (b) Absorption pipette - 3 Nos
- (c) Gas burette - 3 Nos
- (d) Leveling bottle cap. 250 ml - 3 Nos

B12 Hydrogen Purity Test Apparatus

Function: Sensing & Measurement of Hydrogen in Air, gas holders, valves, pipelines, etc.

Range : 0 - 100 % purity

Sensor : Thermal Conductivity Detector

Readout : LCD Digital display.

Sampling Method : suction

Alarms : Audio-Visual alarm for LO, Hi ranges & Battery low

Response Time : Less than 10 seconds.

Power : rechargeable batteries + charger

Instrument shall be supplied with all required accessories.

B13 Bench top TOC analyzer

Bench Top TOC analyzer shall have the following specifications.

Measuring Technique: UV/Heated Persulfate.

Analyzer shall comply with all specifications according to Standard Methods 5310C, EPA 415.2, EPA SW-86 Method 9060A.

The system shall include dual, self-calibrated Non-Dispersive Infrared (NDIR) detectors for maximum sensitivity and durability.

System shall have inbuilt auto sampler with a capacity of 100 vials or more.

Laboratory TOC analyzer shall meet the following specification.

Accuracy: 2% Full scale

Analysis Time: 3 minutes

Particulate handling Up to 750 µm

Linearity ±2% FS, whichever is greater

TOC analyzer shall be supplied with Data Server and User Interface Software, Start-up Kit and Operator's Manuals.

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B14 Flue Gas Analyzer

Flue gas analyzer shall have the following specifications:

Components Measured NO_x/SO₂/CO/CO₂/O₂

Analysis Principle

O₂, CO, NO, NO₂, SO₂: by Electrochemical

CO₂: by NDIR

Flue Gas & Air Temperature Measurement: Temperature Sensor

O₂ Measuring Range: 0 to 25 %

CO measuring Range: 0 to 8000/20000 ppm

NO Measuring Range: 0 to 4000 ppm

NO₂ Measuring Range: 0 to 1000 ppm

SO₂ Measuring Range: 0 to 4000 ppm

CO₂ Measuring Range: 0 to 20%

Flue Gas Temperature: 0 to 999.9 deg C

Efficiency: 1 to 99.9%

Sample Gas Flow Rate Approx.: 1.1 L/min

Display measured value in LCD screen

Instrument shall be battery operated.

Flue gas analyzer shall have internal memory and facility to transfer the data to PC Instrument shall be supplied with all required accessories as a ready to use analyzer.

B15 Oil Content Analyzer

Oil content analyzer with following specification shall be supplied.

Display: LCD

Measurement Method Solvent Extraction

Accuracy Better than 2% of Full Scale

Repeatability Better than 2% of Full Scale

Linear Range: 0 –200/1000 ppm most crudes or dilute sample for higher range Sensitivity: 1 ppm

Calibration: Single-point and blank

Response Time: 5 Seconds

Measures: Diesel, Lube Oil, Fuel Oil, Crude Oil and Gas condensates

Applications: Produced water, Industrial Waste Water, Oil Spill Response.

Minimum Detection Limit : <1 ppm for most oils

Instrument shall supplied with sample cuvettes, 2 liter extraction solvent and calibration standard.

B16 Atomic Absorption Spectrophotometer**PURPOSE**

The instrument is required to determine the following elements in solution as listed below:

- (a) Sodium
- (b) Potassium
- (c) Copper
- (d) Iron
- (e) Magnesium
- (f) Aluminum
- (g) Boron
- (h) Nickel
- (i) Mercury

DESCRIPTION

The instrument will essentially consist of but not be limited to a source of light emitting the line spectrum of an element (hollow cathodic lamp), a device for vaporizing the sample (burner), a device for isolating an absorption line (monochromator or filter and adjustable slit) and a photoelectric detector with associated amplifying and electronic measuring and recording equipment. The instrument will be equipped with all accessories necessary to determine the elements listed above. The instrument will operate on 240V, 50Hz, single phase supply.

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1.0 Name of Equipment: Atomic Absorption Spectrophotometer

2.0 General: Instrument is required for measurement of concentration of metals and heavy metals in liquids.

3.0 Specifications of Equipment:

1. Optics : True Double Beam optical design
2. Monochromator : The system should be based on Echelle Grating/ Aberration Corrected Czerny-Turner Mounting Hollow Graphic Grating or equivalent with grating lines 1600 lines/mm or more
3. Focal Length : 250 mm or more
4. Band width : Variable Band Width from 0.2 to 1.0 nm or 0.2 to 2 nm with automatic switching
5. Detector : Detector technology based on PMT/SSD or equivalent
6. Wavelength : Min :185 – 190 nm; Max : 900 nm
7. Sensitivity : 0.9 abs. for 5 ppm Cu solution
8. Turret : Six lamp turret or more
9. Burner Assembly : Air Acetylene burner head and N2O burner head
10. Software for Parameter Control : All the method parameters related with lamp selection, calibration, control of flow gases should be through integrated software
11. Gas Control : The instrument should have programmable gas controls both for air, N2O and C2H2
12. Software : Software for controlling analyzer, setting-up the method parameters, analyzing the samples and performing calibration

13. Lamps for AAS : Coded Hollow Cathode lamp or better for Automatic recognition & automatic other parameter settings, e.g. lamp current, slit width for following elements-

Sodium, Potassium, Copper, Iron, Magnesium, Aluminum, Boron, Nickel, Mercury

14. Standards for calibration : Standards (Reputed Make) be provided for all the elements as mentioned above in pack of 100 ml (min).

15. Background Correction : Deuterium background correction

16. Hydride Vapour Generator System : Heated automatic Hydride Vapour Generator system for the high sensitivity determination of Mercury and metallic hydride forming elements such as Bi, As, Sb, Sn, Se and Te, alongwith sample flask, reagent reservoir and quartz cell, software controlled.

17. Graphite Furnace : Heated Graphite Atomizer system (Temp. Ambient to 3000°C); easy switch over between Flame and Furnace with software controlled Dual Atomiser System. The furnace should have suitable cooling system.

18. Auto Sampler : Auto sampler for Flame and Furnace

19. Fume Extraction System : Equipment should be supplied along with compatible Fume Extraction system

20. Power Source : 230V AC, 50Hz

21. Voltage Stabilizer : 5 KVA or more

22. Provision for gas leak detection with auto flame shut off.

23. Argon cylinder, Acetylene gas cylinder and Nitrous Oxide cylinder along with suitable regulators, colour coded pressure tubings and air compressor should be supplied from reliable/standard Indian source.

24. Computer System : Branded PC & Printer (HCL/HP/Dell/Lenovo) compatible with the software mentioned above with Intel Core i5 or better Processor, 18" or better LED Monitor, Windows 8.1 or better, 4GB DDR3 or better RAM and HDD 1.0 TB or better; Black & White Laser, Printer with speed 25 PPM or better.

25. Detailed printed Catalogue must be provided with the offer submitted alongwith undertaking from the vendor to supply the genuine make equipment.

The certification in this regard from OEM shall be required at the time of supply of equipment.

26. The supplied unit should not be manufactured prior to 01.01.2015. A certificate to this effect shall have to be submitted from OEM.

B17 Constant Temperature Bath

This shall be used to maintain the temperature of the water in the temperature range 5 deg. C above ambient to 100 deg. C. Accuracy of temperature control shall be $\pm 0.010^\circ\text{C}$.

The tank shall be of stainless steel with stainless steel (or) aluminum housing and a glass view panel. An electric heater with digital temperature indicator cum controller shall be provided. Suitable capacity pump / stirrer shall be provided for the circulation/ agitation of the tank media. Capacity of the tank shall be minimum 25 litres. This temperature bath shall be supplied with necessary accessories.

B18 Water Distillation Assembly

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The double distillation unit shall consist of suitable capacity electrical heaters. Body shall be glass. Capacity of the plant shall be 2.0 lph and a storage tank of capacity 10 ltrs shall also be supplied to store the distilled water.

B19 Vacuum Pressure Pump

Teflon diaphragm based oil-free, portable AC powered vacuum pump for Lab use operating on 230V / 50 Hz.

Accessories:

- (a) Cellulose nitrate membrane filter dia 47mm, pore size 0.45 μ m Qty- 4Packets (each packet having 100 filters)
- (b) All glass filter holders-47mm borosilicate glass filter holder for vacuum filtering of aqueous liquids with clamp, All parts contacting liquid are borosilicate glass with ground glass sealing surface Qty-2 set

B20 Heating Mantle for Oil Analysis

Heating mantle (Single unit) which can withstand high temperature up to 350 $^{\circ}$ C with energy regulator and can hold flask size of 2 liters.

B21 Magnetic Stirrer cum hot Plate

Magnetic stirrer shall be provided with a stainless steel hot plate. The heating energy shall be controlled by stepless speed and energy regulator.

Max speed: 1200 RPM, Stirring Capacity 2 liters.

B22 Lab Refrigerator

Standard Laboratory Model

Quantity - One (1) No for storage of chemicals & one (1) no for storage of samples.

- 1. Type : Electrically operated with freezer, chill trays, crispators and provided with magnetic door latch, pilot bulb, thermostat temperature control, automatic voltage stabilizer, leads, plugs, Double door with auto defrosting etc.
- 2. Capacity : 230 litres
- 3. Voltage : 230V AC nominal with input voltage range

B23 Hot Plate

Hot Plate for continuous heating up to 350 $^{\circ}$ C with cast iron top Size: 200 mm x 300 x 150 mm

B24 Magnetic Stirrer

A magnetic stirrer or magnetic mixer is a laboratory device that employs a rotating magnetic field to cause a stir bar immersed in a liquid to spin very quickly, thus stirring it.

1.0 TECHNICAL SPECIFICATIONS :

- 1.1 Magnetic Stirrer should be electrically operated.
- 1.2 It should be fitted with a speed regulator with maximum speed of 1200 RPM.
- 1.3 Top plate should be made of stainless steel.
- 1.4 Capacity – 2 Litres
- 1.5 The magnetic stirrer should be supplied with Teflon coated stirring bar.
- 1.6 The magnetic stirrer is required without hot plate.

B25 KIPP'S Apparatus

Kipp's apparatus, also called Kipp's generator, is an apparatus designed for preparation of small volumes of gases.

The apparatus is made of three vertically stacked cylinders. The solid material is placed into the middle cylinder; the acid is put into the top cylinder. A tube extends from the top cylinder into the bottom cylinder. The middle cylinder has a tube with a stopcock attached, which is used to draw off the evolved gas. When the stopcock is closed, the pressure of the gas in the middle cylinder rises and expels the acid back into the top cylinder, until it is not in contact with the solid material anymore, and the chemical reaction stops.

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B26 Photometer

Colorimeter shall have pre programmed methods for common water and boiler water parameters like iron, Silica, Phosphate, Hydrazine, Copper and Iron etc., Colorimeter shall be used for both field as well as laboratory testing.

Colorimeter shall be supplied with following:

Eight sample cells

Silica Reagent set for 500 tests

Iron Reagent set for 500 sets

Hydrazine reagent set for 500 tests

Copper reagent set for 500 tests

Phosphate Reagent set for 500 tests

Micro pipette with tips

Carry case

Instructions Manual

B27 Potentiometric Titration Apparatus

Potentiometric titration is a technique similar to direct titration of a redox reaction. No indicator is used; instead the voltage across the analyte, typically an electrolyte solution is measured. To do this, two electrodes are used, a neutral electrode and a standard reference electrode. The voltage is recorded at intervals as the titrant is added

1.0 Name of Equipment : Potentiometer Titration Apparatus

2.0 SPECIFICATION OF EQUIPMENT : The potentiometer Titration Apparatus is required with the following specifications :

Features & Specification

01 Functions : Potentiometric Titration

Karl-Fischer Titration

pH/mV measurement

Temperature measurement

Temperature compensation for pH

Dispenser (Delivery pump)

02 Titration Modes Acid-base titration

Redox Titration

Karl-Fischer Titration

Curve (Constant rate) titration

03 Measuring :	Parameters	Range	Resolution	Accuracy
	pH	0.0 to 14.0	0.003pH	±0.01
	mV	± 0.0 to 1999	0.1 mV	±0.5 mV
	Temperature	0.0 to 100	0.1°C	±1°C

04 pH Calibration pH calibration with Standard Buffer or user selectable standard with Auto or Manual Temp. compensation.

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- 05 Solution Dispensing Mechanism Highly accurate sipper pump with auto calibration
- 06 Display Range & Resolution of volume dispense 99.9 ml with 0.001 ml resolution by using statistic analysis.
- 07 Moisture content calculation 0.0 to 100%
- 08 Calibration In built automatic KF factor calculation facilities after standardization the KF reagent.
- 09 For KF Factor One can use same factor for different sample or can restandardize the KF reagent.
- 10 Stirrer In built Magnetic Stirrer with adjustable speed
- 11 End Point Alarm After titration is over it gives audible deep.
- 12 Time for End Point 0 to 50 Second hold time. When endpoint is achieved, unit waits for stable end point.
- 13 Display & Keyboard LCD digital display and soft touch keyboard with 20 keys.
- 14 Print Provision for printing data be provided.

B28 Gas Heating Assembly

The Gas Heating Assembly (Gas Stove) should conform to IS: 4246.

It should be a Double Burner Cooking Gas Stove without cover and with Non-Automatic Ignition System.

Size – Approx. Dimensions (when packed) 690 x 370 x 110 mm.

It should be sleek, streamlined, high efficiency with stainless steel body.

It should have brass burner tops and stainless steel drip-trays.

It should have one small burner and one big burner.

Detailed printed leaflet be supplied along with quotation.

B29 Stop Watch

Stop Watch 1/100th of second Digital with date, time and one lap function from Reputed indigenous make

Other Terms & Conditions

Document: One hard copy of O&M Manual in English language giving complete technical information for operation and maintenance of the equipment.

Installation and Commissioning: The supplier shall install & commission the equipment at site. Supplier should demonstrate the performance of the Equipment and all its accessories to ensure compliance with complete specifications & parameters quoted by them to the satisfaction of BHEL/end user. Cost of installation & Commissioning, if any, should be indicated separately. Training to chemists at site during installation should be provided for routine maintenance, operation and safety purpose. Failing to comply to the Installation and Commissioning clause, the offer will be rejected straightaway.

Warranty: The equipment shall be warranted for satisfactory performance for a period of 12 months from the date of installation or 18 months from date of dispatch, whichever is later. Failing to comply to the warranty clause, the offer will be rejected straightaway.

Packing & Dispatch: The equipment / accessories shall be packed in a suitable water proof/vibration proof packing box capable of bearing air and road transit hazards. Packing box shall be properly identified and marked with BHEL's (India) Purchase Order Number. Also, "PCRI HWR" should be written in bold letters on all four sides of the packing box.

The Project Specific Terms and Conditions Annexed at Annexure-1 are also to be read in conjunction with this document.

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(Manudev)
Engineer
Initiated by

Shamra
6/10/17
(S K Mishra,
Dy Manager
Checked by

Arshad
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M. N. S. Goel
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AGM
Approved by

CHEMICAL LAB EQUIPMENTS FOR 4 X 270 MW BHADRADI TPS PROJECT

ANNEXURE - II

INDENT NO. 20173162 DATED 06.10.2017

Annexure - C for Package -3 [Material Code - D55995237250]

PACKAGE - 3: Equipments for Coal Analysis for Bhadradi TPS Project (As per List & Details enclosed in Annexure-C)

Sl. No.	Item	Quantity	Specification [Annexured]	Inspection Category	Approved Vendors
1	Proximate Analyzer	1 No	C1	CAT-1	1. Orbit Technologies Pvt.Ltd. 2. Leco Corporation. 3. Precisa Gravimetrics Ag.
2	Automatic isoperibol oxygen bomb calorimeter	2 Nos	C2	CAT-1	1. Parr Instrument company/ Orbit 2. Leco Corporation
3	Muffle furnace	1 No	C3	CAT-1	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Hindustan Apparatus Mfg. Co.
4	Oven	1 No	C4	CAT-2	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Vortex Electronics Pvt Limited. 8. Hindustan Apparatus Mfg. Co.
5	Lab Pulverizer	1 No	C5	CAT-2	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
6	Sieve shaker	1 No	C6	CAT-2	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
7	Jaw crusher	1 No	C7	CAT-2	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders
8	Roll crusher	1 No	C8	CAT-2	2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.

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ANNEXURE - II

9	Humidity oven	1 No	C9	CAT-2	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Vortex Electronics Pvt Limited. 8. Hindustan Apparatus Mfg. Co.
10	Coal sample riffler	1 No	C10	CAT-2	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
11	Furnace for determination of volatile matter	1 No	C11	CAT-1	1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Hindustan Apparatus Mfg. Co.
12	Abrasive/Erosive index machine	1 No	C12	CAT-3	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
13	Laboratory plate mill	1 No	C13	CAT-3	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
14	Raymond mini mill	1 No	C14	CAT-3	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.
15	Analytical balance	1 No	C15	CAT-3	1. Merck Specialist Pvt. Ltd, 2. CAS weighing India Pvt. Ltd, 3. Analytica Equipments (I) Pvt. Ltd, 4. Tula Digital (I) Pvt. Ltd, 5. Vortex Electronics Pvt. Ltd, 6. Avon Corporation Ltd, 7. Precisa Gravimetrics AG, 8. Shimadzu (Asia Pacific) PTE Ltd
16	Ordinary balance	1 No	C16	CAT-3	1. Merck Specialist Pvt. Ltd, 2. CAS weighing India Pvt. Ltd, 3. Analytica Equipments (I) Pvt. Ltd, 4. Tula Digital (I) Pvt. Ltd, 5. Vortex Electronics Pvt. Ltd, 6. Avon Corporation Ltd, 7. Precisa Gravimetrics AG, 8. Shimadzu (Asia Pacific) PTE Ltd

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17	Ash fusion furnace	1 No	C17	CAT-1	1. IR technologies (Leco), Leco USA, 2. Orlab instruments pvt ltd (Sylab), 3. Sylab France
18	CHNS analyser	1 No	C18	CAT-1	1. Thermo 2. Leco 3. Orbit Technologies

Inspection Category details:

CAT 1: Inspection by BHEL's customer [TSGENCO] (based on approved Quality Plan). BHEL MDCC shall be issued based on TSGENCO MDCC.

CAT 2: Inspection by BHEL / BHEL Third Party Inspection Agency. BHEL MDCC shall be issued based on TSGENCO MDCC.

CAT 3: Inspection by BHEL / BHEL Third Party Inspection Agency. MDCC shall be issued by BHEL.

Technical Specification of Items:**C1 Proximate analyzer**

Proximate Analyzer (Thermo Gravimetric Analyzer) for coal and coke, graphite etc shall have the following specifications.

Shall be able to analyze 1 to 19 samples (19 samples + 1 reference) UNATTENDED.

To determine moisture, volatiles, fixed carbon, ash, and LOI.

Furnace Temperature Range: 50 – 1000 deg C

Sample Size: 0.1 – 10 grams

Standard Deviation: +0.0002 grams

Weight Loss/ Gain Range: 0-100%

Temperature stability: ± 1 °C at 105 and ± 2 °C at all other higher ranges controlled with temperature controller

Shall have Dual Ceramic carousels, fully automatic with placement & removal of crucible – covers inside furnace for ash determination. There shall be no manual removing of lids for Ash determination.

All heated parts shall be ceramic - carousels, crucibles, pedestal, covers.

Ramp rate of 50 deg C/min. at 230 V/50 Hz, for volatile measurement, required as per ASTM D-5142-90

Programmable ramp rates 25 °C to 107 °C 5 ~ 30°C/min, 104 °C to 1000 °C 5 ~ 50°C/min, 550°C to 750 °C 5 to 40°C/Min

Automatic restart after power failure

Built-in Analytical Balance 120gms, accuracy: 0.1 mg

Selectable methods configurations for ISO, ASTM, DIN etc

Compressed air assisted cooling for faster cool down

The system shall be operated with Windows based software with 8 editable programs, 50 editable factors for each slope and non-linear regression, with data transmission from LIMS to PC, shall have Open Database Connectivity (ODBC).

Operating Voltage: 20A 220 VAC 50/60 Hz Furnace capacities: 6 kW

Instrument shall be supplied with 20 no's ceramic crucible and covers, Computer, printer etc shall also be supplied.

C2 Oxygen Bomb Calorimeter for Coal Analysis

Automatic bomb calorimeter shall have following specifications:

Type: True Isoperibol with jacket temperature controller to a precision of 0.1°C Instrument: Automatic microprocessor controlled calorimeter

Measurement Range: 1,000 K Cal /Kg to 8,000 Kcal / Kg for 1 gm of Sample.

Precision: 0.1 % RSD or better

Repeatability / Reproducibility: As Per BIS 1350 (Part – 2), 1970, ASTM D-5865/04 & DIN 51900 Methods

Resolution : 0.0001 Cal/gm

Analysis Mode: Equilibrium mode / Dynamic mode or any other mode. Temperature Measuring Resolution: 0.0001° C

Removable bomb and bucket type (in order to meet BIS standard)

Display: Color touch screen with graphical user interface

Correction: Spiking, Ash/ Nitrogen or Acid, Fuse wire, Sulphur and Hydrogen.

Memory Capacity: Minimum 1,000 tests results or more.

Computer / Printer/ Balance Connection: RS 232 Interface

Sample Crucible Capacity: 0.5 gm – 1.5 gm.

Power requirement: 230 VAC +/- 10 %, 50/60 HZ As per Indian condition. Processing Capacity: Maximum 15 – 20 Minutes per sample.

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Standard Accessories:

Oxygen bomb: The oxygen combustion bomb shall have permanent fuse wire and made with special stabilized stainless steel to resist the mixed nitric acid and sulfuric acid produced in combustion. It shall have 342 ml capacity with standing a hydrostatic pressure of 3000 – PSI max and working pressure of 1500 PSI.

One set mandatory spares to be supplied Electronic Balance (0.0001gram readability) with connecting cable Printer with connecting cable Pellet press with ¼" punch & die set

C3 Muffle Furnace for Coal Analysis

Heating elements shall be of KANTHAL wire in coil form wrapped on the muffle, embedded in high grade refractory cement and backed by High Density Ceramic Fibre Blanket, which avoids loss of heat. Max. Temp. : 1200 OC.

Size: 20 x 20 x 30 cm

Accessories:

- (a) Two (2) numbers each of stainless steel tongs of sizes 15 & 24 inch
- (b) One (1) spare heating element

C4 Oven for Coal Analysis

Range: Electrically operated outer chamber made of mild steel & inner chamber made of mild steel/stainless steel/aluminum for drying.

Temp. Range 5deg.C above ambient to 250deg.C Max. temp. Accuracy : +/- 2deg.C

Size: 60X60X90cm

Accessories:

- (a) Two (2) mercury thermometer, range 40 to 250 °C
- (b) Twelve (12) silica crucible of 50ml capacity, with lid
- (c) Temp. Sensor
- (d) Heating element

C5 Lab Pulversier for Coal Analysis

Lab pulverizer Which can be mounted and securely bolted on steel stand with main drive pulley, feed hoper, shifter pulley & belt, screened drum with 212 micron screen, motor pulley, v-belt & six(6) extra screens of 212 microns complete with accessories.

C6 Sieve Shaker for Coal Analysis

Electrically operated Ro-Tap sieve shaker will be furnished to accommodate seven 50mm highX200mm diameter standard test sieves. The shaker will produce both circular and tapping motion to provide uniform mechanical action ensuring accurate and dependable test result.

The shaker will be provided with a timer switch so that the test is automatically terminated after the present time. Standard sieve will be of brass/steel frame 200mm diameter and 50mm high above the wire cloth: and drawn from one piece without a seam.

Accessories:

- (a) Two (2) polished brass lid and pan for the above sieves of 200mm diameter
- (b) Sieves; 850microns, 710microns, 600microns, 500microns, 425 microns, 355 microns, 250 microns and 212 microns

C7 Jaw Crusher

Jaw size: 100X150mm

Maximum feed size: upto 50 mm

Product size: 5 to 15 mm

Capacity: 100 to 200 kg/Hr

C8 Roll Crusher

The machine is to be provided with hopper of suitable size fabricated from mild steel sheet.

Maximum feed size: 8 mm

Product size: 1mm to 2 mm

C9 Humidity Oven

Temperature range: + 50 C to 600 C

Accuracy: ±1 OC

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Temperature and humidity controlled by digital temperature controller cum indicator- LED (dual display) from 40% to 90% with sensitivity of $\pm 3\%$.

Type : Standard laboratory model.

C10 Coal Sample Riffler

Technical Specifications:

1. Riffle Sample divider: Should consist of metal box fitted with series of chutes of equal width which discharges the material alternatively in opposite direction.
2. Slot Width: 13 mm
3. No. of Slots: 14
4. Capacity: 2.1 DM3
5. Ambient Condition: Equipment shall be suitable for operation in ambient temperature from 0-50 degree C and relative humidity of 0-98 %.

C11 Furnace for Determination of Volatile Matter

Maximum operating Temperature -1000°C

Temperature sensor required - Thermocouple Type N mineral insulated

Over temperature protection sensor-Required

C12 Abrasive/Erosive index machine

1. TECHNICAL SPECIFICATION :

- 1.1 Main Equipment: The main equipment should comply with IS 9949-1986 Re affirmed 1994, "Methods of Test for Abrasive Properties of Coal and Associated Minerals.
- 1.2 The equipment should be able to handle high ash coal (upto 45% ash)
- 1.3 Mill Pot: Mill pot or Motor should be of Steel.
- 1.4 Blade Assembly: Blade assembly should consist of four number of carbon steel blades.
- 1.5 Driver unit: Driver unit to be fitted with 2.5 to 3 HP, three phase motor to run at 1450 RPM.
- 1.6 Gauges: Gauges for checking the gap between the edges of the blade and internal wall bottom of mill pot to be supplied.
- 1.7 Accessories: Sieves having nominal aperture / perforated plate having size of 6.3 mm, 12.5 mm conforming to IS 460 (Part i) -1978 along with brush to clean the sieve to be provided.
- 1.8 Painting: The machine shall be painted with two coats of red oxide primer and two coats of light gray paint.
- 1.9 POWER SUPPLY: 220 volts A.C 3 phase, 50Hz
- 1.10 AMBIENT CONDITION: Equipment shall be suitable for operation in ambient temperature 0 to 50 degree Celsius and relative humidity of 0 to 98%.

C13 Laboratory plate mill

TECHNICAL SPECIFICATION :

- 1 Plate Mill: Disc type grinder to grind coal sample to produce about 600 microns (25 mesh) in one operation.
- 2 Disc: Should have rotating disc having planetary motion in the vertical plane. The disc should be hardened/heat treated of about 100 mm dia.
3. Size Reduction: The plate should reduce 450-500 gm sample of coal to 100 mesh in one min or to 25 mesh in 10-15 min.
4. Motor Capacity: 1 HP, Triple V-belt pulley drive and proper mounting
5. Power Supply: 3 phase, 50 Cycles, 440 Volt, AC supply
- 6 Feed Size: 5.0 mm
- 7 Ambient Condition: Equipment shall be suitable for operation in ambient temperature from 0- 50 degree C and relative humidity of 0-98 %.

C14 Raymond mini mill

TECHNICAL SPECIFICATION :

1. Mini Mill: Should be swing type pulveriser designed to powder laboratory samples to 100- 150 mesh.
2. powdering Device: Should have swing hammer type pulveriser design. The hammer to be fitted to a rotating shaft.
3. Size Reduction: The mini mill should be able to reduce the size to 10 -100 mesh size.
4. Motor Capacity: 0.5 HP, Triple V-belt pulley drive I direct coupled & mounting
5. Power Supply: 3 phase, 50 Cycles, 440 Volt, AC supply
- 6 Ambient Condition: Equipment shall be suitable for operation in ambient temperature from 0- 50 degree C and relative humidity of 0-98 %.

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C15 Analytical Single Pan Balance

Capacity: 200 gm

Accuracy: 0.1 mg

Type of display: Digital display

Operating Temperature: 10-45OC

C16 Ordinary Balance

Capacity: 4000 gm

Accuracy: 0.1 gm

Type of display: Digital display

Operating Temperature: 10-45OC

C17 Ash Fusion Analyser

An automatic ash fusion system for the determination of the ash fusion points of ash derived from coal and coke by means of image analysis.

The software of the system shall clearly show the sample images for IDT, ST, HT and FT as per ASTM 1857 and ISO 540-2008.

System shall use the most modern technology for monitoring, computing, storing results and curves obtained during the test according to the standard specifications. The results and the curves shall be automatically store in a DATA BASE and automatic reports shall be printed.

The ash fusion system have the below technical specifications.

Maximum Temperature: 1600 deg C

Temperature ramp rate shall meet ASTM and ISO norms

Resolution 10 OC

Specific temperature determination precision 2000C

6 samples simultaneously analyzed, fully automatic, the analyzer can run overnight (3 runs / day)

Heating Element: Silicon carbide

The system can able to analyze the specimen shapes of all ISO & ASTM defined specimen shapes like pyramids, Conical, cylindrical and Truncated pyramids

Image collection of individual sample 10 OC by 10 OC, image collection of whole camera picture included all samples 40 OC by 40 OC.

The system shall be operated through an external or embedded PC through windows based software

Appropriate software shall be provided for automatic operation of the instrument and storage of digital images at different stages.

There shall be provision for operating the system at various atmospheres such as oxidizing or reducing.

Auto shut off facility of furnace and gases after completion of the test.

The instrument will have proper ventilation facility of hazardous gases.

Automatic light off mode during the test for clear examination of fusion points of the samples

Power supply: 220 VAC, 50 Hz

The complete system shall be supplied with Furnace, External CCD camera with IR filter, Tray-S thermocouple (inside the fusion tube), Long No porous alumina tube equipped with mechanical parts and quartz windows and halogen illuminator, 100 flat alumina trays for simultaneous analysis and specimen preparation kit.

C18 CHNS Analyser

It shall be based on the principle of dynamic Flash combustion (Modified Dumas Method), followed by Gas Chromatographic. Column (GC) Separation & Thermal Conductivity Detection (TCD) of C, N, S and H elements in sub ppm level (100ppm). Instrument shall use He as carrier and O2 as combustion gas.

System shall not have Adsorption Filter in the Pathway for trapping Moisture.

Shall be Field upgradeable to O in future with the changes only in Furnace, reactors and Columns.

The flows of both gases shall be controlled by Electronic Flow meter which is Temperature regulated. Declaration from manufacturer to be provided. Analyser shall be controlled only through independent PC using Window based operating software and shall not have direct control in the instrument.

The Instrument shall have Mimic screen indication the status of the Parameters like Furnace, Flow etc.

Furnace / Combustion Temperature:

CHN-1000 OC and around 1800 OC during combustion of sample

The Analyser shall have the facility of viewing the flash of combustion of the sample.

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Software shall be capable of full instrument control, data acquisition, processing, reprocessing, reporting with the following features

- shall be compatible with Windows™ 2000, XP and Vista operating systems
- Flash EA Methods (CHN, CHNS etc) preset
- Oxy Tune Function (oxygen dosing system by Electronic Flow Controller Thermo-regulated)
- User compound library
- Automatic Heat Value Calculation (i.e. GHV and NHV) for solid and liquid fuels
- Automatic Minimum Formula Calculation (for fine chemicals and synthesis products)
- Maintenance control program
- Wake up, start up and shut off functions
- LIMS compatibility
- LAN Compatibility
- Data Export/Import – ASCII Report file
- Data Export/Import – Excel summary Result file
- Automatic Leak Test
- "Green Light / Red Light": green or red light shows at glance if the data obtained are within the acceptable range.
- Automatic Evaluation of the Empirical Formula:
- 21CFR part 11 compliant

Detector range (for C; H, N, S) : 0.01 % to 100%

Sample size: 0.01 – 100 mg (according to the sample nature) Analysis time: CHNS 12 min, Accuracy for CHNS

Theoretical Value	Experimental Value
0.01 % (100 ppm)	100 ppm ± 10
0.10%	0.1 % ± 0.01
1.00%	1.00 % ± 0.02
10.00%	10.00 % ± 0.1
50.00%	50.00 % ± 0.3
90.00%	90.00 % ± 0.3

Conformance tested by pure organic elemental analysis standards Utilities

Helium: GC grade, He flow: 140 ml/min (measurement channel) and 100 ml/min (reference Channel)

Oxygen: 99.995 % purity

In Stand-By condition the Helium flow shall decrease to 10 ml/min while the Oxygen flow shall be cut off.

Sample Feeding:

Built in Auto sampler for solids & liquids with minimum 32 samples in a single tray, of solid or liquids (supported on a proper solid inert material) placed in tin containers. Additional sample trays shall be available to extend the autosampler's capacity up to 125 samples.

The Autosampler shall be fully motorized and shall not require servo air as utility.

Safety standards

Safety CEI EN 61010-1; 1994+A2:1996+ CEIEN 61010-2-010: 1995

+A1:1997 According to EEC Directive n. 73/23 modified by EEC Directive n. 93 /68

Electromagnetic compatibility

CEI EN 55011: 1991 + A1: 1997+A2: 1996 and EN 50082-2: 1995 and EN 61000-3-2:1995+A13: 1997 and EN 60555-3: 1997 according to EEC Directive n. 89/336 modified by EEC directive n.92/31

Test Method – as per ASTM D 5291, ASTM D 5622, ISO / TS 12902, Solid mineral fuels – Determination of coal, hydrogen and nitrogen –Instrumental methods 2001, ISO 10694.

Specification for Electronic Microbalance

Capacity: 6.1 g

Resolution: 1ug [linear throughout the range up to 6.1g]

Repeatability: 0.8 ug / 0.6 ug (0 ...2g)

Linearity: 4 ug (0 ... 2g) Stabilization time: 8 ... 12 sec

Display: Touchscreen, removable display

Menu: Touchscreen operated 7 languages with info field and functions keys

Interface: 1 RS232 standard.

Slot for an optional second interface:RS232, LocalCan and Minimetler

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Other Terms & Conditions

Document: One hard copy of O&M Manual in English language giving complete technical information for operation and maintenance of the equipment.

Installation and Commissioning: The supplier shall install & commission the equipment at site. Supplier should demonstrate the performance of the Equipment and all its accessories to ensure compliance with complete specifications & parameters quoted by them to the satisfaction of BHEL/end user. Cost of installation & Commissioning, if any, should be indicated separately. Training to chemists at site during installation should be provided for routine maintenance, operation and safety purpose. Failing to comply to the Installation and Commissioning clause, the offer will be rejected straightaway.

Warranty: The equipment shall be warranted for satisfactory performance for a period of 12 months from the date of installation or 18 months from date of dispatch, whichever is later. Failing to comply to the warranty clause, the offer will be rejected straightaway.

Packing & Dispatch: The equipment / accessories shall be packed in a suitable water proof/vibration proof packing box capable of bearing air and road transit hazards. Packing box shall be properly identified and marked with BHEL's (India) Purchase Order Number. Also, "PCRI HWR" should be written in bold letters on all four sides of the packing box.

The Project Specific Terms and Conditions Annexed at Annexure-1 are also to be read in conjunction with this document.

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(Manudev)
Engineer
Initiated by

S K Mishra
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(S K Mishra,
Dy Manager
Checked by

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CHEMICAL LAB EQUIPMENTS FOR 4 X 270 MW BHADRADI TPS PROJECT

ANNEXURE - II

INDENT NO. 20173162 DATED 06.10.2017

Annexure - D for Package -4 [Material Code - D55995237330]

PACKAGE - 4: Environmental Lab Equipments (Chemicals, Glassware, Furniture, Safety & Other General Lab. Requisites) for Bhadradi TPS (As per List & Details enclosed in Annexure-D)

Sl. No.	Item	Quantity	Specification [Annexured]	Approved Category
H	List of Chemicals/Glassware's & Safety items			
1	List of Laboratory Chemicals	01 Set	D1	CAT-2
2	List of Glassware's	01 Set	D2	CAT-2
3	Laboratory Safety Equipments	01 Set	D3	CAT-2
4	List of Laboratory Furniture Module	01 Set	D4	CAT-2
5	General Laboratory Requisite	01 Set	D5	CAT-2

Inspection Category details:

CAT 2: Inspection by BHEL / BHEL Third Party Inspection Agency. BHEL MDCC shall be issued based on TSGENCO MDCC.

D1 List of Chemicals:		
S.N.	Chemical's Name	Quantity
1.0	Acid Acetic	4 X 500 ml.
2.0	Acid Benzoic	2 X 500 gms
3.0	Acid Hydrochloric A.R.	4 X 2.5 lits.
4.0	Acid Hydrofluoric	1 X 500 ml.
5.0	Acid Nitric A.R.	4 X 2.5 lits.
6.0	Acid Thioglycolic	2 X 500 ml.
7.0	Acid Oxalic	1 X 500 gms
8.0	Acid Phosphoric	4 X 500 ml.
9.0	Acid Pyrogalllic	2 X 500 g.
10.0	Acid Sulphuric A.R.	4 X 2.5 lits.
11.0	Acid Succinic	1 X 250 gms
12.0	Acid Tartaric	1 X 500 gms
13.0	Acid 1- Amino - 2 - Napthol - 4 - Sulphonic	1 X 500 gms
14.0	Alcohol (Absolute)	1 X 2.5 lits.
15.0	Alcohol Iso Amyl	1 X 1 lit.
16.0	Alcohol Isopropyl	1 X 2.0 lit.
17.0	Liquid ammonia	6 X 500 ml
18.0	Ammonium Chloride	1 X 500 gms.
19.0	Ammonium Acetate	1 X 500 gms.
20.0	Ammonium Oxalate	1 X 500 gms.
21.0	Ammonium Persulphate	1 X 500 gms.
22.0	Ammonium Thiocyanate	1 X 500 gms.
23.0	Acetone	4 X 500 ml.
24.0	Ammonium Molybdate hepta hydrate	2 X 500 gms.
25.0	Aluminium Nitrate	1 X 500 gms.
26.0	Borocresol green	2 X 5 gms.

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27.0	Borocreson purple	2 X 5 gms.
28.0	Benzene	1 X 500 ml.
29.0	Barium Chloride	1 X 500 gms.
30.0	Barium Chromate	1 X 500 gms.
31.0	Bromophenol Blue	1 X 5 gms
32.0	Bromophenol Purple	1 X 5 gms
33.0	Bentonite	1 X 500 gms
34.0	Calcium Chloride	4 X 500 gms.
35.0	Calcium Chloride (fused)	2 X 2.5 kgs.
36.0	Calcium Oxide	1 X 500 gms.
37.0	Calcium Carbonate	1 X 500 gms.
38.0	Citric Acid	2 X 500 gms
39.0	Carbon Tetra Chloride	4 X 500 ml.
40.0	Copper Oxide (Wire form)	1 X 500 gms.
41.0	Copper Sulphate	1 X 500 gms.
42.0	Cuprous Chloride	2 X 500 gms.
43.0	Dextrose	2 X 500 gms.
44.0	Di - phenyl Amine	2 X 500 gms.
45.0	EDTA Di-Sod. Salt	2 X 500 gms
46.0	Dimethyl Glyoxime	1 X 5 gms
47.0	Eriochrome Black T	1 X 25 gms.
48.0	Ether	2 X 500 ml.
49.0	Ethanol	4 X 500 ml
50.0	Ferrous Ammonium Sulphate	2 X 500 gms.
51.0	Ferric Chloride	2 X 500 gms.
52.0	Ferrous Sulphate	2 X 500 gms.
53.0	Formaldehyde	2 X 500 ml.
54.0	Fuller's Earth	1 X 500 gms.
55.0	Glycerol	4 X 500 ml.
56.0	Hydrazine di-hydrochloride	2 X 100 gms.
57.0	Hydroxyl amine hydrochloride	4 X 100 gms.
58.0	Hydrogen Peroxide (30%)	4 X 500 ml.
59.0	Iodine ample (N/10)	6 X 6 amps
60.0	Iron Standard Solution (100 ppb)	2 X 100 gms
61.0	Indigo Caramine	1 X 25 gms.
62.0	Iodine, sublimed	1 X 500 gms.
63.0	Kaolin	1 X 2.5 kg.
64.0	Lead Acetate	1 X 500 gms.
65.0	Lead Chromate	1 X 500 gms.
66.0	Litmus, universal	1 X 6 roll
67.0	Magnesium Chloride	1 X 500 gms.
68.0	Magnesium Oxide	1 X 250 gms.
69.0	Magnesium Sulphate	2 X 500 gms.
70.0	Mercuric Chloride	2 X 500 gms.
71.0	Mercuric Thiocyanate	1 X 250 gms.
72.0	Murexide (Ammonium Perpurate)	1 X 10 gms.
73.0	Mercuric Iodide	4 X 250 gms.
74.0	Methanol	6 X 500 ml
75.0	Methyl Orange powder	2 X 25 gms.
76.0	Morpholine Standard solution	2 X 100 ml
77.0	Methyl Red powder	2 X 25 gms.
78.0	Nitric acid	4 X 2.5 lit

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ANNEXURE - II

79.0	Para di-methylamine benzaldehyde	2 X 100 gms.
80.0	Petroleum ether (40 – 60)	6 X 500 ml.
81.0	pH Buffer Capsule, 4.0	6 X 10 caps.
82.0	pH Buffer Capsule, 7.0	6 X 10 caps
83.0	pH Buffer Capsule, 9.2	6 X 10 caps
84.0	Phenolphthalein powder	2 X 100 gms.
85.0	Potassium bi-carbonate	4 X 500 gms
86.0	Potassium di-hydrogen Ortho Phosphate	2 X 500 gms
87.0	Potassium Chloride	2 X 500 gms.
88.0	Potassium Hydroxide	4 X 500 gms.
89.0	Potassium Permanganate	2 X 500 gms.
90.0	Potassium Iodide	2 X 500 gms.
91.0	Potassium Iodate	1 X 500 gms.
92.0	Potassium Chromate	1 X 500 gms.
93.0	Potassium Dichromate	4 X 500 gms.
94.0	Potassium Dihydrogen Phosphate	1 X 500 gms
95.0	Potassium Persulphate	1 X 500 gms.
96.0	Potassium Nitrate	1 X 500 gms.
97.0	Potassium Acid Phthalate	1 X 500 gms.
98.0	Phenolphthalein	1 X 25 gms
99.0	Phenol	1 X 500 gms.
100.0	Silica standard solution, 100 ppb	2 X 100 ml.
101.0	Silica standard solution, 1000 ppm	2 X 100 ml.
102.0	Silver nitrate ample (N/10)	6 X 6 amps
103.0	Silver Nitrate	2 X 250 gms.
104.0	Sodium carbonate anhydrous	6 X 500 gms
105.0	Sodium chloride anhydrous	6 X 500 gms
106.0	Sodium hydroxide pallets	6 X 500 gms.
107.0	Standard copper solution, 100 ppb	2 X 100 ml.
108.0	Starch, potato	2 X 500 gms
109.0	Sulphuric acid	4 X 2.5 lts.
110.0	Sodium acetate	1 X 500 gms
111.0	Sodium carbonate	1 X 1.0 kg
112.0	Sodium Bicarbonate	1 X 500 gms.
113.0	Sodium Meta Bisulphite	4 X 500 gms.
114.0	Sodium Sulphate	1 X 500 gms.
115.0	Sodium Sulphite	1 X 500 gms.
116.0	Sodium Thiosulphate	4 X 500 gms
117.0	Sodium Nitrate	1 X 500 gms.
118.0	Stop Cock Grease (Silicon)	1 X 250 gms.
119.0	Silica (Quartz, Pulverized)	1 X 500 gms.
120.0	Stannous Chloride	1 X 100 gms.
121.0	Silica Gel (6 – 16 mesh)	1 X 500 gms.
122.0	Toluene	1 X 500 ml.
123.0	Thorin Indicator	1 X 5 gms.
124.0	Universal pH indicator	1 X 500 ml.
125.0	Zinc Sulphate hepta hydrate	2 X 500 gms.
126.0	Zinc Dibenzyl Dithiocarbamate	1 X 100 gms.

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D2 List of Glassware :**ANNEXURE - II**

1.0	Burettes – Straight bore stopcock, Borosil/Corning/Duran/equivalent Class B with works certificate				
	Capacity	Graduation Interval (ml)	Tolerance (+/- ml)	Total Heights (mm)	Quantity
	100	0.2	0.1	830	3
	50	0.1	0.05	780	6
	25	0.1	0.05	530	6
	10	0.05	0.02	530	6
2.0	Burettes, Automatic Zero, mounted on reservoir, Borosil /Corning/Duran/equivalent (Reservoir Capacity – 2000 ml.)				
	Capacity (ml)	Graduation Interval (ml)	Quantity (Nos.)		
	50	0.1	3		
	25	0.1	3		
	10	0.05	3		
3.0	Pipettes, Transfer volumetric, Accuracy as per Class B with works certificate Borosil / Corning/Duran/equivalent				
	Capacity	Tolerance (+/- ml)	Quantity (Nos.)		
	100	0.08	6		
	50	0.05	6		
	25	0.03	6		
	10	0.02	6		
	5	0.015	6		
	2	0.01	4		
	1	0.007	4		
4.0	Pipettes (Mohr type). Accuracy as per Class B with works certificate Borosil / Corning/ Duran/equivalent				
	Capacity (ml)	Graduation Interval (ml)	Quantity (Nos.)		
	10	0.1	12		
	5	0.1	12		
	2	0.1	6		
	1	0.1	4		
5.0	Volumetric flasks with stopper. Accuracy as per Class B with works certificate Borosil / Corning/ Duran/equivalent				
	Capacity (ml)	Interchangeable Stopper size	Quantity (Nos.)		
	2000	19/20	2		
	1000	19/20	4		
	500	19/20	6		
	250	14/15	6		
	100	14/15	12		
	50	15/10	12		

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ANNEXURE - II

	25	15/10	12
6.0	Graduated cylinders single Metric scale as per Class B with works certificate Borosil / Corning/Duran/equivalent		
	Capacity (ml)	Graduation Interval (ml)	Quantity (Nos.)
	2000	20	2
	1000	10	4
	500	5	6
	250	2.5	6
	100	1	6
	50	1	6
	25	0.5	6
	10	0.2	6
7.0	Flasks, Erlenmeyer, Conical, Narrow mouth, Borosil/Corning/Duran/equivalent		
	Capacity (ml)	O.D X Height (mm x mm)	Quantity (nos)
	1000	131 X 220	6
	250	85 X 140	12
	150	72 X 124	12
	100	64 X 105	12
8.0	Beakers, Griffin Low Form with spout. Borosil/Corning/Duran/equivalent		
	Capacity (ml)	O.D X Height (mm x mm)	Quantity (nos)
	2000	131 X 190	4
	1000	105 X 148	12
	400	77 X 105	12
	250	68 X 95	12
	100	50 X 72	12
	50	42 X 55	12
9.0	Flasks, Boiling, Round Bottom, Short Neck with Interchangeable Joint. Borosil/ Corning/Duran/ equivalent		
	Capacity (ml)	Size of inter	Quantity (nos)
		changeable stopper (mm)	(Nos.)
	1000	24/29	4
	500	24/29	4
10.0	Flasks, distilling with side arm Borosil/ Corning/Duran/ equivalent		
	Capacity (ml)	O.D X Height (mm x mm)	Quantity (Nos.)
	500	110 X 250	4
11.0	Funnels, Plain 60° Long Stem, Borosil/ Corning/Duran/ equivalent		
	Capacity	Quantity	
	(ml)	(Nos.)	
	50	6	

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	75	6	
	100	4	
12.0	Funnels, Separating with Stopcock and Interchangeable Stopper, pear shape. Borosil / Corning/Duran/equivalent		
	Capacity (ml)	Stopper Size (mm x mm)	Quantity (Nos.)
	500	24/25	3
	250	19/20	10
13.0	Bottles, Reagent Plain Narrow Mouth and Interchangeable Stopper, pear shape. Borosil/ Corning/ Duran/equivalent		
	Capacity (ml)	O.D X Height (mm x mm)	Quantity (Nos.)
	2000	126 X 265	4
	1000	104 X 200	24
	500	80 X 172	24
	250	64 X 147	24
	125	54 X 120	12
14.0	Bottles, Reagent Amber. Narrow Mouth with interchangeable flat head stopper		
	Capacity (ml)	Total Height (mm)	Quantity (Nos.)
	1000	200	6
	500	172	6
	250	147	6
15.0	Dropping Bottles		
	Dropping bottles with 0.5-ml. Droppers :		
	Capacity (ml)	Quantity (Nos.)	
	100	12	
	Dropping bottles clear glass, T.K. pattern with slotted ground stopper :		
	Capacity (ml)	Quantity (Nos.)	
	100	6	
	Dropping bottles, Amber glass, T.K. pattern with slotted ground stopper :		
	Capacity (ml)	Quantity (Nos.)	
	100	6	
	Winchester bottles, with slotted ground stopper :		
	Capacity (ml)	Quantity (Nos.)	
	2500	6	
	1000	6	
16.0	Bottles, Aspirator with tubular at bottom and connection designed with flexible tubing. Borosil / Corning/ Duran/ equivalent		
	Capacity (Lit.)	Quantity (Nos.)	
	5	2	
	10	2	
17.0	Bottles, wash, complete with interchangeable stopper. Borosil/Corning/Duran/equivalent		
	Capacity (ml)	Quantity (Nos.)	
	1000	4	

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18.0	Bottles, weighing with interchangeable stopper. Borosil / Corning/Duran/equivalent		
	Diameter (mm)	Body Height (mm)	
	20	40	
	40	80	
19.0	Watch glasses. Borosil / Corning/Duran/equivalent		
	Diameter (mm)	Quantity (Nos.)	
	7.5	12	
	10	12	
20.0	Watch glasses, Borosil / Corning/Duran/equivalent		
	O.D. X Height (mm x mm)	Quantity (Nos.)	
	50 X 40	6	
	100 X 50	6	
21.0	Petri Dishes, Crystallizing, Borosil/ Corning/ Duran/ equivalent		
	O.D. X Height (mm x mm)	Quantity (Nos.)	
	50 X 17	12	
	80 X 17	12	
22.0	Dishes, Evaporating, Flat Bottom with pour out Borosil/ Corning/Duran/ equivalent		
	O.D. X Height (mm x mm)	Quantity (Nos.)	
	80 X 45	6	
23.0	Desiccators with knob top Borosil/Corning/Duran/ equivalent		
	ID of Ground Flange (mm)	Overall Height (mm)	Quantity (Nos.)
	110	150	4
	160	225	3
24.0	Desiccators, Vacuum with cover & sleeve Borosil/ Corning/Duran/equivalent		
	ID of Ground Flange (mm)	Overall Height (mm)	Quantity (Nos.)
	160	225	2
25.0	Distilling Apparatus with Graham Condenser, Interchangeable Joints, Interchangeable stopper, Borosil / Corning/Duran/equivalent		
	Capacity (ml)	Condenser Jacket (mm)	Quantity (Nos.)
	500	200	2
26.0	Condensers, Liebig Drip Tip, Interchangeable joint and Interchangeable outer joint. Borosil / Corning / Duran / equivalent		
	Jacket length (mm)	Interchangeable Inner	Quantity (Nos.)
	300	24/29	2
D3 List of Laboratory Safety Equipment:			
	Item	Size	Quantity
1	Coat (Long coat)	Chest size 34", 36", 38"(Men's)	6 Nos.
2	Rubberized cloth apron	114 (L) x 86 cm (W)	6 Nos.
3	Asbestos gloves	20 cm (L)	6 pairs
4	Natural rubber gloves	Free Size	6 pairs

Signature
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ANNEXURE - II

5	Neoprene gloves	Size 7	6 pairs.
6	Neoprene gloves	Size 8	6 pairs
7	Silicon rubber hand protector	-	12 Nos.
8	Respirator for toxic dust complete with filter	-	6 Nos.
9	Gas mask suitable against ammonia, chlorine, sulphur dioxide, acid fumes	-	3 Nos.
10	Safety goggles to avoid chemical splash, Soft vinyl frame with plastic ventilators, Optical quality, distortion free replaceable lens, with rubber head band	-	6 Nos.
11	First Aid Cabinet similar to Fisher Catalogue 203 No. 10-020	-	4 sets
12	Toxic and Hazardous chemicals chart similar to Fisher catalogue 203 No. 10-027-1	-	2 Nos.
13	Laboratory safety chart similar to Fisher Catalogue 203 No. 10-027-10	-	4 Nos.
14	Eye/Face wash wall mount similar to Fisher Catalogue 203 No. 91-572	-	4 Nos.
15	Safety signs such as eye wash, exit, fire extinguisher, no smoking, first aid kit, acid spillage, etc., displayed in the laboratory	-	4 Nos.

D4 List of Furniture:

S. N.	Item	Material of Construction	Quantity	Range of Dimensions(in mm)		
				Length	Width	Height
F1	Fume Chamber	Double skin 20 SWG CRCA Steel with an inner lining of compressed asbestos (1.6 mm) Painted with epoxy paint.	1 No.	1500	750	2350

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F2	Working Table	The Bench Tops shall be made from core of block board to which tiles are to be bonded with polyurethane or epoxy compound. The area joined with acid resistant cement.	10 Nos.	1200	750	750
F3	Wall Mounted Chemical Storage Units	20 SWG CRCA with epoxy paint, 2 tier adjustable shelves	10 Nos.	750	300	600
F4	9- Cabinet Island Assembles With Elevated Shelves & End Sink Peninsula type	To be equipped with mixing faucet, plastic p-trap, 2 cold water faucets, 6 double gas/air /vacuum cocks, 2 double faced duplex electrical outlet boxes. The bench top shall be designed as per F2.	1 No.	4860	1500	850
F5	Elevated Shelves	2 tire reagent shelves with polyurethane or epoxy finish. The shelves shall be made of 20 SWG CRCA steel.	10 Nos.	900	300	600
F6	Modular Under- Bench Storage Units	20 SWG Steel with epoxy coated	10 Nos.	700	500	800
F7	Wall Storage Cupboard	The units shall have horizontal sliding glass doors in plastic channels. Two adjustable shelves are to be provided	10 Nos.	750	300	600
F8	Anti-Vibration Instrument Table	Tops shall be furnished in shell white melamine laminate, antivibration rubber pads are to be fixed on surface.	8 Nos.	900	600	700
F9	Working Desk	1 drawer & 1 shutter unit.	10 Nos.	1200	750	750
F10	4- Cabinet Island Assemblies With Elevated Shelves & Center Sink, Peninsula Type	The Top shall be as per F4.	1 No.	2100	1500	900
F11	Steel Racks	Slotted angle steel racks with antirust paintings.	10 Nos.	900	450	1800
F12	Revolving Chairs	As per Fisher Catalogue	12 Nos.			
F13	Revolving Stools	As per Fisher Catalogue	10 Nos.			

NOTE:

The entire furniture module shall comply with the following properties:

1. Chemical Properties: Resistance to acids, alkalis, solvents.
2. Physical Properties: Resistance to heat and temperature Change, Static, Conductivity
3. Mechanical Properties: Impact resistance, surface hardness, workability.
4. All metallic parts of modular furniture shall be epoxy powder coated electro statically. Prior to this, it will also undergo 7-tank phosphate treatment for anti-rusting/anti-corrosion.
5. The Fume Chamber unit shall be provided with a sink in 16 SWG SS 316 grade, 1 x water point, 2 x 5/15 amp. Electrical point at front facia.

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The fume chamber shall be inclusive of FRP, centrifugal blower with 1 HP-3 phase electrical motor. The blower is connected through fume chamber by 225 mm dia. HDPE pipe of 2.5 kg/cm² pressure.

H5 List of General Laboratory Requisite:

Sr. No.	Item	Quantity
1.	Nickel plates steel tongs (lengths - 50 cms)	4 Nos.
2.	Nickel plates steel tongs (lengths - 25 cms)	4 Nos.
3.	Steel Tongs - 25 cms	4 Nos.
4.	Stainless steel beaker tongs - 25 cms	4 Nos.
5.	Stainless steel basin tongs - 25 cms	4 Nos.
6.	Stainless steel flask tongs - 25 cms	4 Nos.
7.	Pipette stand Fisher type	6 Nos.
8.	Test tube stand Fisher type	6 Nos.
9.	Double burette stand	12 Nos.
10.	Rectangular retort stand bases with retort stand rods	12 Nos.
11.	Tripod stand, Triangular top Wire gauge	50 Nos.
12.	S Steel spatulas with riveted handles	12 Nos.
13.	Stainless steel spatulas flask with spoon end	12 Nos.
14.	Scissors, stainless steel	6 Nos.
15.	Burette Brushes	12 Nos.
16.	Test tube brushes	12 Nos.
17.	Flask Brushes	12 Nos.
18.	Asbestos Mats- 150 sq. m	24 Nos.
19.	Asbestos Mats- 300 sq. m	24 Nos.
20.	Cork borer sets with borer sharpener	6 Nos.
21.	Velvet corks (assorted size)	100 Nos.

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6/10/17

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22.	Corks rubber (assorted size)	100 Nos.
23.	Mortar, porcelain with lip, fitted with wood handle	2 Nos.
24.	Agate motor and pastel (dia. 5 cms)	2 Nos.
25.	Agate motor and pastel (dia. 7.5 cms)	2 Nos.
26.	Crucibles, Porcelain with perforated bottom and complete with perforated discs : 4.5 cms x 4.2 cms	6 Nos.
27.	Crucibles, Porcelain with perforated bottom and complete with perforated discs : 4.9 cms x 3.6 cms	6 Nos.
28.	Crucibles, Platinum	4 Nos.
29.	Combustion boats silica (50 ml)	6 Nos.
30.	Combustion boats silica (25 ml)	6 Nos.
31.	Pipe clay triangles iron wire with pipe Clay stalks for holding the above boats	12 Nos.
32.	Glass cutting knives	4 Nos.
33.	Rubber gloves assorted size	12 Nos.
34.	Rubber tubing assorted size	12 Nos.
35.	Bottle trays for acid bottle	10 Nos.
36.	Magnets with keepers (10 cm long)	2 Nos.
37.	Magnifying glass with handle	2 Nos.
38.	Wash bottle polythene (1000 ml capacity)	12 Nos.
39.	Polythene bottle - 1000 ml	12 Nos.
40.	Polythene bottle - 500 ml	12 Nos.
41.	Polythene bottle - 250 ml	12 Nos.
42.	Polythene bottle - 100 ml	12 Nos.
43.	Polythene bottle - 50 ml	12 Nos.
44.	Safety Tray	6 Nos.

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Other Terms & Conditions

Packing & Dispatch: The equipment / accessories shall be packed in a suitable water proof/vibration proof packing box capable of bearing air and road transit hazards. Packing box shall be properly identified and marked with BHEL's (India) Purchase Order Number. Also, "PCRI HWR" should be written in bold letters on all four sides of the packing box.

The Project Specific Terms and Conditions Annexed at Annexure-1 are also to be read in conjunction with this document.

Manu
6/10/17

(Manudev)
Engineer
Initiated by

S K Mishra
6/10/17

(S K Mishra,
Dy Manager
Checked by

Dr. S Bhatnagar
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(Dr. S Bhatnagar)
SDGM
Supervised by

Ambrish Goel
6/10/17

(Ambrish Goel)
AGM
Approved by

		QUALITY PLAN											
		ITEM : -----					QP NO : ----- REV: 00 DATE : ----- Page -----of-----			PROJECT : ----- ENQUIRY NO. : -----			
S.NO	COMPONENT / OPERATION	CHARACTERISTIC CHECKED	CATEGORY	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS
										M	C	N	
1	2	3	4	5	6	7	8	9	D	10	11	12	13

1	Item Name:----- -----												
1.1	1. Make 2. Model 3. Range 4. Bill of Material 5. Other Parameter	Visual	Major	Physical	100%	Tech. Spec. / Approved Documents	Tech. Spec. / Approved Documents	IR / TC	D	P	V / W	V / W	CHP
1.2	Performance Test 1. Accuracy Test 2. Repeatability Test 3. Response Test	Functional	Major	Electrical	100%	Tech. Spec. / Approved Documents	Tech. Spec. / Approved Documents	IR / TC	D	P	V / W	V / W	CHP
1.3	Calibration Test Reports	Calibration	Major	Electrical	100%	Tech. Spec. / Approved Documents	Tech. Spec. / Approved Documents	TC	D	P	V	V	
1.4	Packing	Packing	Major	Physical	100%	Tech. Spec. / Approved Documents	Tech. Spec. / Approved Documents	TC	D	P	V	V	

	LEGEND : M – SUPPLIER / SUB SUPPLIER C – BHEL / NOMINATED INSPECTION AGENCY N – CUSTOMER / CUSTOMER NOMINATED AGENCY CHP- CUSTOMER HOLD POINT REPORT D - DOCUMENTS P – PERFORMED BY W – WITNESSED BY V – VERIFICATION BY TC – TEST CERTIFICATE IR- INSPECTION		
MANUFACTURER / SUBCONTRACTOR SIGN & SEAL	RECORDS IDENTIFIED WITH "V" SHALL BE ESSENTIALLY INCLUDED IN QA DOCUMENTATION.	REVIEWED BY SIGN & SEAL	APPROVED BY SIGN & SEAL

Annexure – 1**Project Specific Terms & Conditions for Environmental Laboratory Equipment for
4x270 MW Bhadradi TPP**

These conditions are in addition to latest version of General Instructions and Standard Terms & Conditions (GISTC) for bidding against Tender Enquiry.

1. Bidder to quote each item of a Package separately as per specifications & corresponding approved vendors and also submit original catalogue of the each item issued by its Original Equipment Manufacturer (OEM) alongwith Technical bid. Failing this, the offer for the package is liable to be rejected.
2. The bidder shall ensure that supply of each item shall be made through approved vendors mentioned in its corresponding Technical Specifications. A certificate issued from approved vendor in this regard shall have to be submitted with offer for each item.

Installation & Commissioning (I & C) of item/items shall have to be carried out either by approved vendor himself or its duly authorized representative. Authorisation in this regard shall also have to be submitted with the offer.

Warranty of each item of the package should be extended by approved vendor. BHEL reserves the right to seek warranty also issued from OEM of the item for any item of the package at its discretion.

The entire responsibility of supply, I & C shall however remain with the bidder.

3. All the items in the package would be required to be supplied in totality on intimation by BHEL.
4. The intimation for supply of the package will be issued by BHEL within one year from the date of placement of Purchase Order without any additional financial implication on BHEL.
5. Shelf life of Solutions/Standards required for the item/items should be valid for at least 18 months from date of supply. Shelf life of these Solutions/Standards should also be indicated in the packing list submitted for issue of Material Dispatch Clearance Certificate (MDCC) by BHEL prior to dispatch of item.
6. The prices should be quoted Ex-works freight pre-paid basis. Freight Charges from vendor's works to project site should be mentioned (quoted) separately in the price bid.
7. It shall be responsibility of vendor to handover all the items of the package to any of the BHEL approved transporters in time.
8. Evaluation of bids for decision of lowest bidder would be made based on offered price for complete package which shall include all taxes, duties, freight, Packing & Forwarding, I & C charges etc.
9. Bidder should submit list of imported items proposed to be supplied in the package alongwith technical bid.

Inspection and Testing :

1. Quality Assurance Plan (QAP) is to be submitted for each item of the package separately along with technical offer for approval of BHEL. Offers submitted without QAP are liable to be rejected.

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2. The category of inspection of each item has been indicated in technical specification of the items. BHEL reserves the right to amend category of inspection as per project requirement.
3. The manufacturer shall conduct all routine/mandatory tests required to ensure that the equipment furnished conforms to the requirements of its specifications & approved QAP, applicable Codes and Standards.
4. BHEL / BHEL's Customer / Nominated third party inspection agency may inspect items as per approved QAP/Technical Specifications. The vendor will provide all necessary support without any additional financial implication on BHEL.

Installation & Commissioning (I & C) :

1. The scope of I & C shall include receipt of items from BHEL's site store, transportation to required location (Laboratory Building) for installation/erection, operation, calibration with standards/solutions, training and demonstration to BHEL/Customer officials. The vendor shall arrange all the required tools & tackles/chemicals/glasswares/consumables/commissioning spares/supply cables or any other requisite for successful I & C, demonstration of equipment without any additional financial implication on BHEL.
2. Construction of anchorage/pocket foundation/bolts/foundations etc. required for satisfactory I & C of all the items of the package including Coal Analysis items like Lab Pulveriser, Sieve Shaker, Jaw Crusher, Roll Crusher, Coal Sample Riffler, Abrasive/Erosive Index Machine, Laboratory Plate Mill, Laboratory Mini Mill etc. will be in the scope of vendor without any additional financial implication on BHEL.
3. The vendor may visit the site/Laboratory building prior to taking up I & C of the equipments to make all necessary arrangement at his end. It shall be responsibility of the vendor to arrange and complete all the I & C and demonstration of all the items of the package in time bound manner through required one or more visits and to entire satisfaction of BHEL/BHEL's Customer as per BHEL specifications and contract conditions and also obtain unconditional handing over protocol for all the items in the package.
4. Completion of I & C of the package shall be considered after receipt of unconditional handing over protocol of all the items of the package. No part completion of the package shall be considered for closure of I & C of the package for processing the balance payment.-
5. Schedule of I & C of package shall be intimated by BHEL normally within 06 months from date of dispatch of package. I & C of the package shall have to be taken up promptly and completed within 08 weeks from date of issue of intimation for I & C.. In case of delay in completion of I & C, a penalty of delay @ 1% of balance payment per week shall be imposed, subject to a maximum of 10 % of balance payment. The delay and applicable penalty shall be intimated in writing. In case of delay beyond 10 weeks, BHEL reserves the right to proceed and get the I & C done by alternate source at risk & cost to vendor without further intimation to vendor.


(Manudev)

Engineer

Initiated by


(S K Mishra,) 6/10/17

Dy Manager

Checked by


(Dr. S Bhatnagar) 7/10/17

SDGM

Supervised by


(Ambrish Goel)

AGM

Approved by

DETAIL OF ANNEXURE - II

TECHNICAL SPECIFICATION

Annexure-A for Package-1 (Material Code: D55995237160)

No. of Pages = 12

TECHNICAL SPECIFICATION

Annexure-B for Package-2 (Material Code: D55995237390)

No. of Pages = 12

TECHNICAL SPECIFICATION

Annexure-C for Package-3 (Material Code: D55995237250)

No. of Pages = 8

TECHNICAL SPECIFICATION

Annexure-D for Package-4 (Material Code: D55995237330)

No. of Pages = 12

STANDARD QUALITY PLAN (SQP) FORMAT

No. of Pages = 1

PROJECT SPECIFIC TERMS & CONDITIONS

Annexure-1

No. of Pages = 2

Total No. of Pages = 47

DETAIL OF ANNEXURE-III

COMPLIANCE SHEET

[Package-1]

No. of Pages = 14

COMPLIANCE SHEET

[Package-2]

No. of Pages = 14

COMPLIANCE SHEET

[Package-3]

No. of Pages = 9

Total No. of Pages = 37

Compliance Sheet [Package - 1]

A1 - Bench Top Conductivity meter

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.	Offered Vendor:	
2	Application:	Instrument is used for determination of conductivity, TDS, salinity, resistivity and temperature.	
3	SPECIFICATIONS OF EQUIPMENT :	The Conductivity Meter with conductivity probe, conductivity standard and of following specifications should be provided.	
4	Range	0 to 1000 mS/cm with minimum low level measurement of 0.001	
5	Accuracy	0.5% or better	
6	Temperature compensation	Automatic	
7	Display	Digital Display	
8	Power Requirement	Mains operated (220 Volts AC $\pm$ 10%, 50 Hz $\pm$ 3%, single phase supply) / Battery operated	
9	Standard Accessories	1. Conductivity probe for low conductivity with Flow through vessel. 2. Electrode stand. 3. Conductivity standard of 100 μ S/cm 4. 1 No. spare cell	
10	Detailed printed Catalogue must be provided along with the offer submitted.		

A2 - Portable Conductivity meter

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.	Offered Vendor:	
2	Application	Instrument is used for determination of conductivity, TDS, salinity, resistivity and temperature.	
3	Specifications of Equipment	The Portable Conductivity Meter with conductivity probe, conductivity standard and of following specifications should be provided.	
4	Range	0 to 1000 mS/cm with minimum low level measurement of 0.001	
5	Accuracy	0.5% or better	
6	Temperature compensation	Automatic	
7	Display	Digital Display	

8	Power Requirement	Mains operated (220 Volts AC $\pm$ 10%, 50 Hz $\pm$ 3%, single phase supply) / Battery operated.		
9	Standard Accessories	1. Conductivity probe for low conductivity with Flow through vessel. 2. Conductivity standard of 100 μ S/cm 3. 1 No. spare cell		
10	Detailed printed Catalogue must be provided along with the offer submitted.			

A3 - Bench Top pH meter

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.	Offered Vendor:	
2	Application pH is a measurement of the acidity or alkalinity of substance (generally Liquid). pH Meter is required to measure pH of water and other liquid samples.		
3	SPECIFICATIONS OF EQUIPMENT Portable pH meter with built-in NTC temp probe-single combination electrode with built-in temperature probe. The portable pH Meter should be of following specifications:		
4	Range pH 0 to 14		
5	Accuracy pH $\pm$ 0.01 pH		
6	Temperature compensation Automatic		
7	Display Digital Display		
8	Input connections pH Combination electrode with Temperature Sensor		
9	Power Requirement Mains operated (220 Volts AC $\pm$ 10%, 50 Hz $\pm$ 3%, single phase supply) / Battery operated		
10	Accessories 1. Single combination electrode with inbuilt temp.probe 2. One spare pH electrode. 3. Electrode Stand 4. Buffer Tablets / Solutions (4, 7 & 10 pH) - 1 Pack of 100 Nos. or 1.0 Litre Solution of eachpH 5. Electrode filling solution 6. Dust Cover 7. Guide to pH measurement		
11	Detailed printed Catalogue must be provided along with the offer submitted.		

A4 - Portable pH meter

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Labindia Instruments Pvt. Ltd. 2. Environmental & Scientific 3. Toshniwal Instruments Manufact. 4. Orbit Technologies Pvt.Ltd. 5. DKK-TOA Corporation 6. Metrohm Ag.	Offered Vendor:	
2	Application pH is a measurement of the acidity or alkalinity of substance (generally Liquid). pH Meter is required to measure pH of water and other liquid samples.		
3	SPECIFICATIONS OF EQUIPMENT Portable pH meter with built-in NTC temp probe-single combination electrode with built-in temperature probe. The portable pH Meter should be of following specifications:		
4	Range pH : -2 to 19.9		
5	Accuracy pH ± 0.01 pH		
6	Temperature compensation Automatic		
7	Display Digital Display		
8	Input connections pH Combination electrode with Temperature Sensor		
9	Power Requirement Mains operated (220 Volts AC ± 10%, 50 Hz ± 3%, single phase supply) / Battery operated		
10	Accessories 1. Single combination electrode with inbuilt temp.probe 2. Electrode filling solution 3. One spare pH electrode. 4. Buffer Tablets / Solutions (4, 7 & 10 pH) Pack of 100 Nos. or 1.0 Litre Solution of eachpH) 5. Carrying Case 6. Batteries 7. Instruction Manual		
11	Detailed printed Catalogue must be provided along with the offer submitted.		

A5 - Turbidity meter

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Analytical Technologies Ltd. 2. Environmental & Scientific 3.Analytica Equipments(I) Pvt. Ltd 4. Orbit Technologies Pvt. Ltd.	Offered Vendor:	
2	Application The turbidity meter is used for determination of Turbidity in water samples.		

3	SPECIFICATIONS OF EQUIPMENT :		
	Turbidity meter shall be a microprocessor based instrument for measuring turbidity. Instrument shall have Auto Ranging from 0 to 1000 NTU. Instrument senses turbidity level of sample and automatically adjusts to the appropriate measurement. Instrument shall have a facility for Auto Alert Calibration Prompt: Automatically prompts the operator when calibration of the instrument is needed. It shall have Simple Calibration Procedures: Calibration initiated with the push of a button ensures accurate readings.		
	Turbidity meter shall have infrared lamp source for colored samples measurement. Instrument shall meet international standard ISO 7027 for turbidity measurement. Turbidity meter shall have resolution of 0.01 NTU at low turbidity readings and an extended range to 1,000 NTU. Turbidity meter shall be delivered along with the following accessories: 1. Calibration Standards (0.02, 10 and 100 NTU). 2. Two measuring cuvettes with light shield caps (1 Set) 3. Operator's manual (1 Nos.) 4. Plug-in power adapter (1 No.) Detailed printed Catalogue must be provided along with the offer submitted.		

A6 - Dissolved Oxygen Analyzer (ppb level)

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialist Pvt. Ltd, 2. Aaxis Nano Technologies 3 Analytical Technologies Ltd. 4. Orbit Technologies Pvt. Ltd. 5. Bibby Scientific Ltd.	Offered Vendor:	
2	APPLICATION:	Equipment is required to measure dissolved oxygen in ppb levels for Boiler/DM/Condensate water.	
3	SPECIFICATIONS OF EQUIPMENT :	Dissolved Oxygen Meter should be microprocessor-based, with the following specification :	
4	Range	1 ppb to 20 ppm	
5	Accuracy	± 1.5% of reading or ± 0.2 ppb	
6	Temperature range	0.0 to 50.0 OC	
7	Probe	Dissolved Oxygen Probe with Cable	
8	Power Requirement	Mains operated (220 Volts AC ± 10%, 50 Hz ± 3%, single phase supply) / Battery operated.	
9	Standard Accessories	1. Dissolved Oxygen probe 2. Flow through cell 3. Battery 4. Support stand	
10	Detailed printed Catalogue must be provided along with the offer submitted.		

A7 - Flame Photometer for Water Analysis

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Analytical Technologies Ltd. 2. Environmental & Scientific 3. Orbit Technologies Pvt. Ltd. 4. Bibby Scientific Ltd. 5. Usha Instruments & Chemicals	Offered Vendor:	
2	Range. : 0 to 199.9		
3	Working range -		
4	Na : 0.5-10 ppm		
5	Ca : 3 – 40 ppm		
6	K : 0.75-25 ppm		
7	Reproducibility : 1% CV for 20 consecutive samples using 10 ppm Na set to 50 scale reading		
8	linearity : Better than 2% when Na & K are 3 ppm, & are set to 100 scale reading		
9	Specificity : Interference from Na, K equal in concentration to test of element will be less than 0.5%		
10	Recorder output : Nominal 1.00 V for a reading of 100.0 K standard solution, Na standard solution, Ca standard solution, regulator for natural gas, Air compressor 220V.		

A8 - Dissolved Oxygen Meter

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialist Pvt. Ltd, 2. Aaxis Nano Technologies 3 Analytica Equipments(I) Pvt. Ltd. 4. Orbit Technologies Pvt. Ltd. 5. Bibby Scientific Ltd.	Offered Vendor:	
2	APPLICATION: Equipment is required to measure dissolved oxygen in water.		
3	SPECIFICATIONS OF EQUIPMENT :		
4	Dissolved oxygen meter with barometric pressure/automatic temperature compensation, salinity correction, point calibration, with digital LCD display. Battery cum mains operated.		
5	Range 0-20 mg/L with high sensitivity membrane.		
6	Accuracy: ±0.5% of the value, Operating temp.: -5 to 50 OC, Protection waterproof.		
7	Essential/Standard Accessories including DO Electrode, Output Cable & Instruction Manual.		
8	Detailed printed Catalogue must be provided along with the offer submitted.		

A9 - UV-VIS Spectro Photometer

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Orbit Technologies Pvt. Ltd. 2. Shimadzu (Asia Pacific) pvt. Ltd., 3. GBC Scientific Equipment Pvt. Ltd.	Offered Vendor:	

2	General	Preprogrammed UV Visible Spectrophotometer with a unique combination for fast, accurate and precise measurements of Water Quality parameters and Spectral Analysis with the following specifications:		
3	Specifications of Equipment:			
3.1	Wavelength Range	190 - 1100 nm		
3.2	Monochromator type	Grating monochromator with step motor		
3.3	Spectral Bandwidth	4nm		
3.4	Wavelength Reproducibility	±0.5 nm (shall be checkable, with holmium Oxide filter)		
3.5	Lamp type	Xenon Flash lamp with approx. 10 years Lamp life.		
3.6	Photometric measuring range	±3.3 A Photometric resolution: $\Delta A = 0.001$		
3.7	Photometric linearity	<1% for A < 2.000 in the range 340 to 900nm		
3.8	Photometric Accuracy (in the range 200 to 1000nm)	0.003 A for A < 0.600 0.5% of the reading for 0.600 < A < 2.000		
3.9	Photometric Reproducibility (in the range 200 to 1000nm)	±0.002 at A=1.000 Scattered Light: <0.1% transmission at 340 and 408 nm.		
3.10.	In built Cell adoptability :	Automatic cell reorganization facility		
3.11	Password protection for user management			
3.12	Methods and profiles Over 100 water analysis methods, 100 user defined methods, 20 Profiles each for kinetics and spectra.			
3.13	Measuring modes	concentration, Absorbance, % transmission, Multi-wavelength Storage for 1000 values for spectra and kinetics approx. 4 MB, e.g.100 spectra (300-900 nm) and 400 kinetics with 150 values Updates via Internet and USB-Stick		
3.14	Interfaces : 1 USB-A, 1 USB-B, 1 RS232 for Data transfer to PC and Printer and Data transfer from PC.			
3.15	Analytical Quality Assurance : AQA support of standard parameters			
3.16	Ambient Condition : Equipment shall be suitable for operation ambient temperature from 0-50°C and Relative humidity of 0-98%.			
3.17	Spectrophotometer shall be supplied with 10, 20, 50 mm glass cells and pour through cell along with reagents for silica, Iron, copper, phosphate for 1000 test each parameter.			

A10 - Jar Test Apparatus

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Testing instruments, 2. Aaxis Nano Technologies, 3. Divya Remedies, 4. Yorco Sales pvt ltd, 5. Macro scientific works, 6. Popular traders	Offered Vendor:	
2	This shall be suitable for continuous run in a laboratory.		
3	Illuminator base shall consist of fluorescent tube mounted below translucent plastic plate to provide diffused cold light through floc samples.		
4	The Jar tester shall consist of geared continuous run heavy duty 1/20 HP variable speed motor from 10 to 100 rpm with built in speed control.		
5	Stainless steel stirring rods (6 nos.) shall be provided with adjustable spacers to adjust the depth of stirring paddles.		
6	The stirring shaft shall be removed without disturbing other stirrers.		
7	The unit shall be supplied complete with breakers.		
8	6 No Jars, Jar Capacity : 1 liter		

A11 - Analytical Balance

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialist Pvt. Ltd, 2. Analytical Technologies Ltd. 3. CAS weighing India Pvt. Ltd, 4. Analytica Equipments (I) Pvt. Ltd, 5. Tula Digital (I) Pvt. Ltd, 6. Vortex Electronics Pvt. Ltd, 7. Avon Corporation Ltd, 8. Precisa Gravimetrics AG, 9. Shimadzu (Asia Pacific) PTE Ltd	Offered Vendor:	
2	Analytical Balance with metal housing to protect weighing cell and electronics, compact design, brilliant backlit display.		
3	The balances shall have automatic calibration with internal weight and it shall be possible to calibrate with external weights also.		
4	Weighing range : 220 gms		
5	Readability : 0.0001 g		
6	Linearity : 0.0002 g		

A12 - Ion Chromatograph

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Metrohm 2. Thermo 3. Orbit Technologies	Offered Vendor:	

2	Ion Chromatography System to analyse various Anions like Cl-, F-, Br, BrO-3, NO2, NO3, PO4-3, SO4-3, ClO-4, ClO-3 etc. Organic acids, Cations like Na+, K, Li+, NH4+, Ca+, Mg, and amines etc.		
3	Solvent Delivery Pump: Non metallic PEEK based 0-14 pH & 100% Reverse phase HPLC solvent compatible, isocratic, dual piston reciprocating microprocessor based controlled for flow range of 5ml/min in 0.01 increment with pressure pulsation: <1% & flow precision: <0.2% , operating pressure: 0-4500 psi or more. Fully controlled by Chromatography		
4	System will consist of column heater or shall have heater field up-gradation capability in future. The column heater will operate over the range of 30 to 60 °C with an accuracy of +/-0.5 °C at 40 °C.		
5	IC system will be inert having non-metallic PEEK (polyetheretherketone) fluidic components throughout the system to ensure solvent compatibility and metal contamination-free chromatography.		
6	Pump will have Vacuum degasser or the provision for add on optional Vacuum degasser.		
7	Suppressor will be operated continuously. Suppressor regeneration will be carried out either chemically or electrolytically.		
8	Suppressor will have capacity to suppress for Carbonate and Bicarbonate eluent or Hydroxide eluents. CO2 removal device will be provided along with suppressor to minimize the background conductivity for anion analysis in case of Carbonate and Bicarbonate eluent chemistry. Cation analysis shall be performed using suppressor or non-suppressed mode.		
9	Conductivity detector microprocessor digital signal processing based with 0-13000 µS or more Digital & Analog output with 0.1nS resolution and noise: ± 0.1nS with temperature compensation and temperature range of 7 to 55 Deg. C with 0.01 Deg. C accuracy.		
10	License version of Chromatography software to control complete IC system, data acquisition, processing & reporting, etc. The software will be able to provide full automatic control of the process of analyzing samples.		
11	Auto sampler (Optional): Automated sample for loading of samples having a capacity of 50 Poly vials of 5ml or 0.5 ml vial size or better .Variable volume injection for 0.1 ml to5.0 ml or better. All Autosampler vials should be closely covered in sampler by Autosampler cover to avoid environmental and light effect.		
12	It should be transfer data into computer/laptop		

A13 - Weather monitoring station

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Virtual Hydromet Pvt Ltd. 2. Envirotech Instruments Pvt.Ltd. 3. Aimil Ltd. 4. Netel (India) Limited. 5. Novalynx 6. Orlab	Offered Vendor:	
2	Weather monitoring station including wind speed sensor, wind direction sensor, rainfall sensor, relative humidity and temperature sensor.		
3	Weather monitoring station shall be supplied with data logger, Data reporting software, PC and printer.		
4	APPLICATION : Measurement of meteorological parameters in ambient atmosphere at Pre-defined intervals, storage and display of meteorological data.		
5	TECHNICAL SPECIFICATION : Weather monitoring station comprising of following:		
5.1	WIND SPEED SENSOR		

5.1.1	Measuring Range : 0-50 m/s		
5.1.2	Resolution: 0.1 m/s		
5.2	WIND DIRECTION SENSOR:		
5.2.1	Measuring Range : 0 to 360 degree angle		
5.2.2	Resolution: 2 degree		
5.3	AMBIENT TEMPERATURE SENSOR:		
5.3.1	Measuring Range : -20 to 70 degree centigrade		
5.3.2	Resolution: 0.5 degree centigrade		
5.4	RELATIVE HUMIDITY SENSOR :		
5.4.1	Measuring Range : 0 - 100% RH		
5.4.2	Resolution : 1°C		
5.5	RAINFALL SENSOR :		
5.5.1	Sensor: Tripping bucket Rain gauge sensor		
5.5.2	Measuring Range : 0 to 999.9 mm		
5.5.3	Resolution : 1 mm		
5.6	SOLAR RADIATION:		
5.6.1	Measuring Range : 0 to 1300 W/m2		
5.6.2	Resolution : 1 W/m2		
5.7	DATALOGGER: Data logger having 8 sensor channels and 8 digital channels, upto 256 KB memory capacity with buffer battery power supply through built in 12 V/6.5 Ah, Real time clock with calendar and Liquid Crystal Display for instantaneous values of wind speed, direction, RH, Solar radiation and temperature, data readout through memory card and RS232		
5.8	SOFTWARE: Suitable software package for data transfer to computer, measured value acquisition, graphical presentation system for meteorological data including preparation of wind roses.		
5.9	MOUNTING ACCESSORIES: Tripod stand with provision of mounting all sensors with fittings and connecting cable of approximate length of 10 mt from sensors to data logger.		
5.10.	CONSTANT VOLTAGE TRANSFORMER : Suitable constant voltage transformer for stabilized voltage (230 V AC, 50 Hz) to the weather station.		
5.11	COMPASS : Standard magnetic compass for setting direction of Wind direction sensor.		
5.12	AMBIENT CONDITION : Equipment shall be suitable for operation in ambient temperature from 0 to 50 degree Celsius and relative humidity of 0 to 98%.		

A14 Portable Dew Point Meter.

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Endee 2. Virtual 3. Techmark 4. Orlab	Offered Vendor:	
2	Dew point range : 60 to 0 deg C		
3	Sensor Type: Capacitance thin film polymer sensor		
4	Indication: Digital		
5	TECHNICAL SPECIFICATIONS :		
5.1	Range: (-) 60 o to 0 o C		
5.2	Resolution: ± 0.1 o C		

5.3	Maximum Operating Pressure :	1 bar		
5.4	Accuracy :	± 2 deg C Dew point		
5.5	Sensor Connection:	Internal Sensor Connection required with the Dew point meter		
5.6	Calibration:	Calibration will be manual		
5.7	Sensor:	Capacitance thin film polymer Sensor		
5.8	Indication:	Digital		
5.9	Power supply:	230 V AC		
5.10.	Cabinet:	Table mount with carrying case		

A15 Dial Type Barometer

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Wishwani scientific 2. Vikash Scientific 3. Popular 4. Reputed indigenous make	Offered Vendor:	
2	Dial Diameter: 100 mm		

A16 Maximum & Minimum Thermometer

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Wishwani scientific 2. Vikash Scientific 3. Popular 4. Reputed indigenous make	Offered Vendor:	
2	The thermometer shall register both maximum and minimum temperature. Range: -40°C to +50 °C		

A17 Dry & Wet bulb Thermometer

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Wishwani scientific 2. Vikash Scientific 3. Popular 4. Reputed indigenous make	Offered Vendor:	
2	This is shall be mercury filled wet and dry Bulb thermometers mounted on scales with amended graduations in 2 Deg. C intervals.		
3	Nominal range 10 Deg. C to 50 Deg. C.		
4	Hand blown glass cistern.		
5	Overall dimensions 108 mm width x 225 mm high, with holes for wall mounting along with wick and booklet of relative humidity tables.		

A18 Stack monitoring kit

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Vayubodhan upkaran 2. Netel india ltd. 3. Polltech instruments	Offered Vendor:	
2	Stack monitoring kit for iso-kinetic sampling consisting of control, flow totaliser module (dry gas meter), impinger and condenser module, pitot tube and other accessories.		
3	Specification:		
3.1	Stack monitoring Kit as per IS 11255, consisting of :-		
3.1.1	Instrument Panel with fibre cover consisting of thermocouple, inclined cum vertical manometer, stop watch, rotameters, Cold Box Assembly.		
3.1.2	Vacuum Pump Assembly		
3.1.3	Probe Set consisting of probe pipe, pitot tube, thermocouple, filter holder, interconnecting hose pipes, nozzles .etc.		
3.1.4	Dry Gas Meter		
4	Technical Specifications:		
4.1	Stack Temperature Range: Ambient to 600 Deg C.		
4.2	Stack Velocity Range: 0-50 m/sec		
4.3	Particulate sampling: 10– 60 lpm		
4.4	Gaseous sampling: 1-2 lpm in a of Borosillicate glass impingers.		
4.5	Digital Temperature Indicator : 0-600 deg. C		
4.6	Thermocouple : Thermocouple sensor in SS casing, Length of insertion 1 m with 2m long cable		
4.7	Pitot Tube : S-type pitot tube fabricated from SS, 1.5 m in length		
4.8	Rotameter: Rotameter with 2% FSD accuracy, 0-60 lpm for Particulates and 0.6-5 lpm for gases		
4.9	Differential Density Manometer Assembly		
4.10.	Extension Vacuum Hose Pipe, 10 m long		
4.11	Sampling Probes: Made from SS, 1.5m length		
4.12	Filter Holder: Fabricated from SS suitable to hold either cellulose filtration thimble (size- 28mm ID & 100mm long) or glass micro fibre, thimble (Size-19mmID, 90 mm long)		
4.13	Whatman Cellulose Thimble (size-28mm ID & 100mm long) – 1 pkt. with kit		
4.14	Nozzles: A set of 3 SS nozzles (1/4, 3/8, 1/2 inch)		
4.15	Digital Clock: 0-60 minutes, 1 second, readout with start and stop watches.		
4.16	Sampling Train: 5 borosilicate glass impingers of 250 ml cap., accommodated in cold box .		

A19 - Portable water quality analyzer

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Orbit technologies 2. Vortex electronics 3. Analytica Equipments	Offered Vendor:	
2	Portable water quality analyzer for measuring pH, ORP, ION, conductivity, TDS, salinity, dissolved oxygen, Turbidity and temperature in water and waste water samples.		
3	It shall have large backlit Liquid crystal display.		
4	Instrument shall have below technical requirement		
4.1	pH Range : 0.00 ... 14.00,		
4.2	Accuracy : ±0.1 pH		

4.3	ORP Range	: 1000 to +1000 mV,		
4.4	Accuracy	: ±1 mV		
4.5	Dissolved oxygen	: 0.00 to 20.00 mg/L, Accuracy:±0.1 mg/L		
4.6	Saturation measuring	: 0.0 to 200 %, Accuracy:±1%		
4.7	Conductivity	: 0 µs/cm to 200 ms/cm,		
4.8	Accuracy	: ±1% full scale		
4.9	TDS Range	: 0 to 20 ppt		
4.10	Turbidity	: 0 to 1000 NTU		
4.11	Accuracy	: <5% of the Full scale NTU.		
5	Instrument shall be supplied with pH/ORP probe, Conductivity probe, and Dissolved oxygen probe, Turbidity measuring devise, short instruction manual, standard solutions and carry			

A20 - Autoclave

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Jain Scientific Glass Works. 2. Divya Remedies. 3. Yorco Sales Pvt. Ltd. 4. Narang Scientific Works Pvt. 5. Macro Scientific Works (Regd.). 6. Popular Traders.	Offered Vendor:	
2	GENERAL : autoclave is required for sterilization & preparation of Culture media for microbiological tests.		
3	SPECIFICATION OF EQUIPMENT :		
3.1	The Autoclave should be double wall construction with boiler made of stainless steel 16 gauge sheets.		
3.2	The Autoclave should be 50 liters capacity approximately.		
3.3	There should be mineral wool/glass wool insulation between Boiler and outer shell.		
3.4	Lid should be made of thick stainless steel plate and tightened all – around by radial locking / wing nut arrangement.		
3.5	There should be joint less gaskets made of neoprene rubber.		
3.6	This sterilizer should be hydraulically tested upto 40 psi.		
3.7	Sterilizer should be fitted with arrangement to indicate water level inside the boiler.		
3.8	Pressure gauge, air/Steam release cock and double safety valves should be provided.		
4	There should be Immersion type heating element of adequate wattage to achieve desired temperature and pressure. Stainless Steel basket should be provided.		

A21 - BOD incubator

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialities Pvt. Ltd. 2. Usha Instruments & Chemicals 3. Divya Remedies 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd).	Offered Vendor:	
2	Temperature range: 5 Deg. C to 50 Deg. C Temp Stability: ± 2 Deg. C		
3	Power: 230 V, 50 Hz, and 2.5 Amps		
4	It shall be provided with a double walled clear see-through door for visual inspection of the samples without opening the door.		
5	Thermostatically Controlled BOD Incubator of Volume 230 Ltrs.(approx.)		

A22 - COD Reactor

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialities Pvt. Ltd., 2. Jain Scientific Glass Works, 3. Spectralab Instruments Pvt., 4. Yorco Sales Pvt. Ltd., 5. Macro Scientific Works (Regd.) , 6. Orbit Technologies Pvt. Ltd., 7. Popular Traders, 8. Hindustan Apparatus Mfg. Co.	Offered Vendor:	
2	COD reactor/digester to be used to for the sample digestion for the measurement of COD and all other thermal digestion processes. Reactor shall be dry temperature control device with safety cover and Cell shafts 12 cell shafts for reaction cells 16 ± 0.2 mm.		
3	Reaction time setting 20 min, 30 min, 60 min, 120 min (via fixed programs) Temperature setting 100 °C, 120 °C, 148 °C and 150 °C via fixed programs Controlling accuracy ± 1 °C ± 1		
4	Temperature stability ± 0.5 K		
5	Over temperature protection 190 °C ± 5 °C		
6	Heating time (with empty thermo block) from		
6.1	25 °C to 100 °C approx. 5 min		
6.2	120 °C approx. 7 min		
6.3	148 °C approx. 10 min		
7	Digestion unit shall come along with the following accessories and reagents: cuvettes Pk/25 empty digestion vessels. 250 tests reagents for up to 1500 ppm COD.		

A23 - Inoculation Chamber

Sl. No	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: Reputed indigenous make	Offered Vendor:	
2	The Inoculation chamber should be Vertical laminar flow cabinet with 100% exhaust system, suitable for exhaust duct upto 6 ft. to throw the contaminated air from the work area into the atmosphere outside the room.		
3	The size (working size) of the Inoculation chamber should be approx. 3 x 2 x 2 ft.		
4	A plenum should be provided under the S.S. perforated working table, with exhaust system which should work in coordination with the main air flow system.		
5	The whole cabinet should be made out of stainless steel.		
6	The side panels should be made of thick transparent plexi glass duly framed.		
7	The unit should be fitted pre-filter and HEPA filter so that air is drawn through pre-filter and is		
8	The air should flow down vertically from top towards the work table.		
9	HEPA filter and virus burn out should also be provided at the exhaust.		
10	The unit should be fitted with duly balanced, direct drive motor blower units sized to provide		
11	The unit should be complete with S.S. Table Top, Transparent front door (5 mm), Static		
12	The work area should be properly illuminated by diffused, glare free fluorescent light fitted to		
13	The number, location, rating and make of motor / motors being used in the equipment should		
14	The equipment should work on 230 Volts AC, 50 Hz single phase supply.		
15	The following spare accessories should be quoted		
15.1	• HEPA Filter		
15.2	• Pre Filter		

Compliance Sheet [Package - 2]

B1 - Apparatus for oxidation stability test

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Culture Instruments. 2. Hindustan apparatus 3. Equivalent Vendor	Offered Vendor:	
2	Test Capacity: 4 oxidation cells		
3	Temperature Range: ambient to 100°C		
4	Temperature Control Stability: 0.1°C		
5	Bath Medium: white technical oil		
6	Electrical Requirements : Operation on 230V AC		

B2 - Red wood viscometer for oil analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1.Hindustan Apparatus Mfg. Co. 2 .Petroleum Instruments 3.Divya Remedies 4. Popular traders	Offered Vendor:	
2	A standard viscometer in which the viscosity is determined by the time, in seconds, certain quantity of liquid to pass out through the orifice under given conditions; used for determining viscosities of fuel oils.		
3	According to IP 70 USED OR DETERMINATION OF VISCOSITY OF LUBRICATING OILS AND FUELS WITH STAINLESS STEEL JET :		
3.1	Viscosity below 2000 secs		
3.2	Electrically heated model with control (Voltage varrier copper type)		
3.3	Spare receiving flask (50 ml)		
3.4	Thermometer for Redwood (with Calibration Certificate) *I.P 8C (0/45 X 0.2 C) *I.P. 9C (40/85C X 0.2C)		
3.5	Calibration certificates of the thermometer should be supplied along with the equipment		

B3 - Interfacial tension apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Culture Instruments 2. Equivalent Vendor	Offered Vendor:	
2	250mm borosilicate glass capillary tube		
3	Engraved graduations		
4	Graduated from 0 to 10cm, in 1mm divisions		
5	Cork holds capillary tube inside outer tube		
6	Outer tube accommodates rubber tubing		

B4 - Automatic Flashpoint Apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Divya Remedies. 2. Yorco Sales Pvt. Ltd. 3. Macro Scientific Works (Regd.). 4. Popular Traders. 5. Hindustan Apparatus Mfg. Co.	Offered Vendor:	
2	The apparatus is microprocessor controlled fully automatic to determine the closed cup flashpoint ensuring accurate and repeatable measurement.		
3	Automatic correction of flash point per actual barometric pressure shall have electric and gas igniters.		
4	Temperature range: 79 to 400° deg C.		
5	APPLICATION: Automatic measurement of Flash Point of oil and lubricants.		
6	TECHNICAL SPECIFICATION :		
6.1	MEASURING RANGE : 15°C to 370 °C		
6.2	FLASH POINT DETECTION : Differential thermocouple/Ionization.		
6.3	STIRRING SPEED : 120 & 250 rpm		
6.4	TEMPERATURE CONTROL: Programmable, software for temperature control.		
6.5	CORRECTIONS: Automatic correction of flash point, as per actual barometric pressure.		
6.6	OPERATION: Micro processor controlled, 14 pre-programmed test methods, programmable library for the user with suitable software support for easy to operate .		
6.7	ENCASEMENT : Encasement/cabinet of Corrosion resistant stainless steel material.		
6.8	POWER SUPPLY : 230 V , 50 Hz.		
6.9	DATA OUTPUT : RS 232 interface.		
6.10	AMBIENT CONDITION : Equipment shall be suitable for operation in ambient temperature from 0 to 50 degree Celsius and relative humidity of 0 to 98%		

B5 - Penetrometer for grease testing

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Petroleum Instruments (India) Pvt. Ltd., 2. Equivalent Vendor	Offered Vendor:	
2	Test Method Compliance ASTM D217 IP 50 ISO 2137 FTM 791-373		
3	AUTOMATIC GREASE WORKER		
4	Power supply 230V ±10% 50Hz		
5	Power 800W		
6	Weight 37 kg		
7	Dimensions 41x30x50 cm		
8	AUTOMATIC GREASE WORKER 2 POSITIONS		
9	Power supply 230V ±10% 50Hz		

B6 - Dean & Stark Apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Reputed Indigenous make	Offered Vendor:	
2	Dean & stark app. for estimation of moisture in lubricating oils as per IP-74, ASTM D 95.		
3	The apparatus shall consist of receiver 10ml graduated, with 19/26 outer joint and 24/29 inner joint, round bottom flask 1000ml with 24/29 outer joint and liebig condenser 200 mm with 19/26 joint.		

B7 - Explosimeter

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Endee 2. Equivalent Vendor	Offered Vendor:	
2	An explosimeter is a device which is used to measure the amount of combustible gases present in a sample. When a percentage of the lower explosive limit (LEL) of an atmosphere is exceeded, an alarm signal on the instrument is activated.		
3	The device, also called a combustible gas detector, operates on the principle of resistance proportional to heat—a wire is heated, and a sample of the gas is introduced to the hot wire. Combustible gases burn in the presence of the hot wire, thus increasing the resistance and disturbing a Wheatstone bridge, which gives the reading. All standard accessories required for proper operation shall be supplied along with the instrument		
4	Gas To Be Detected : All Explosive Gases		
5	Range : 0 to 100% LEL		
6	Detection Principle: Catalytic Pellister		
7	Display: LCD		
8	Battery : Rechargeable Battery		
9	Battery Operating Time : 3 Hours		
10	Temperature : -10 to 50 Deg C		
11	Alarm : Audible & Visual		
12	Warm up time : 10 Sec		

B8 - Centrifuge for Oil Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Divya Remedies. 3. Yorco Sales Pvt. Ltd. 4. Macro Scientific Works (Regd.). 5. Vortex Electronics Pvt Limited. 6. Popular Traders. 7. Remi	Offered Vendor:	
2	The driving motor and the centrifuge chamber have been specially designed to suit the hazardous requirements of oil centrifuge application.		
3	These units are equipped with a Stepless speed regulator, Safety Lid interlock to prevent cover opening during centrifugation, Digital speed meter and 0-60 minutes digital countdown timer, Dynamic break for quick deceleration, Imbalance detector with cut off.		

4	Max. Speed: rpm: 5250, No. of tubes: 4. each tube shall have a capacity of 100 ml and shall be of glass.		
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B9 - Coulometric K.F. Titrator for Oil Analysis

Sl. No.	Technical Requirement		Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor:	1. Merck Specialitics Pvt. Ltd. 2. Labindia Instruments Pvt. Ltd. 3. Toshniwal Instruments Manufact. 4. Analytica Equipments(I) Pvt. L. 5. Spectralab Instruments Pvt. 6. Orbit Technologies Pvt.Ltd. 7. Metrohm Ag.	Offered Vendor:	
2	Coulometric Karl Fischer Titrator for measuring moisture content in Transformer oil,lube oil in ppm range.			
3	Measuring range:5 ppm to 5%			
4	Principle of measurement: Coulometric method			
5	The instrument should be supplied with Titration cell with all necessary small parts formounting			
6	Name of Equipment: Karl-Fisher Titrator			
7	General: The instrument is used for measurement of moisture in oil.			
8	Specifications of Equipment:			
8.1	Type:	Microprocessor Based Digital Automatic Karl Fischer Titration Apparatus (Coulometric)		
8.2	Suitability:	Suitable for estimating very minute traces of moisture in samples such as Transformer Oils / Insulating Oils & Petrochemical Products		
8.3	Method:	Coulometric Karl-Fisher Titration		
8.4	Moisture Measuring Range:	Upto 10 mg		
8.5	Readability:	0.001 mg		
8.6	Accuracy:	0.01 mg (Highest Accuracy with simple operation)		
8.7	Display Format:	Liquid Crystal Display in ppm (mg/Kg)		
8.8	Printer:	Printer Port provided to connect printer		
8.9	Power Supply:	230V AC, 50Hz		
8.10	Serial Interface:	RS 232 port		
8.11	It shall have coulometric cell without diaphragm, constant current pulse time control by			
8.12	The equipment shall have facility to compensate drift automatically and independent memory			
8.13	The instrument shall have facility to connect to printer/computer and balances separately along with in-built clock calendar.			
8.14	Essential/Standard Accessories and spares should be included along with Built-in magnetic stirrer, Titration cell (200 ml), Reagent for Coulometric KF Titration and Water Standard.			

B10 - Gas Chromatograph

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Aimil 2. Shimadzu 3. Thermo	Offered Vendor:	
2	Complete Gas chromatography (GC) system for measuring dissolved gases in transformer oil. GC shall consist of Oven, FID, TCD detectors, gas extraction system, methanizer and other accessories required for dissolved gas analysis.		
3	Instrument shall be supplied with calibration gas standards, PC and printer.		
4	GC Controller: Microprocessor Based Gas Chromatograph with Data Processor, Digital Pressure and flow control for carrier gas, along with auto leak check facility in the digital measurement through hardware complete with necessary standard accessories. Column Oven		
5	Temperature Range: Ambient - 400°C		
6	Oven Capacity: 15 - 25 litres		
7	Temperature Deviation: 2°C maximum		
8	Temperature variation coefficient : 0.01°C/°C		
9	Temperature program steps: Up to 20 (cooling program possible)		
10	Programmed rate setting range: -250°C ~250°C/min		
11	Total time for all steps: 9999.99 minutes max.		
12	Linear heating rate: 30°C/min upto 150°C; 20°C/min upto 250°C 10°C/min upto 380°C; 7°C/min upto 400°C		
13	Cooling Rate: 250°C or 300°C to 50°C in 6 or 7 mins		
14	Columns: Capillary columns: 2; Packed columns: 2 Sample Injection Unit		
15	Temperature Range: Up to 400°C		
16	Heating Settings: 1°C steps		
17	Number of units that can be installed : Up to Three simultaneously		
18	Type: Dual packed, single capillary injection- Split/splitless (Compatibility to complete range of capillary columns) Carrier Gas flow Controller		
19	Range: 0-100 m2/min		
20	Steps: 6 or 7		
21	Thermal Conductivity Detector (TCD) and FID Detector System		
22	Temperature Range: 400°C		
23	The chromatograph shall be equipped with Column Oven, Sample Injection unit, Carrier gas flow		
24	Suitable Capillary and packed column as per application to be provided.		
25	Filled Nitrogen gas cylinder (99.9 % pure, 7-8 cu.m.), Hydrogen gas cylinder (99.9 %, 7cu.m.) and		
26	Standards for calibration of TCD and FID Detector System.		
27	Computer System : Branded PC of reputable Indian manufacturer with printer with compatible software alongwith 5 KVA online UPS with 30 minutes backup.		

28	All essential accessories required for the operation of the Gas Chromatograph should be quoted.		
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B11 - Orsat Apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Jain Scientific Glass Works. 2. Vikas Scientific Works. 3. Divya Remedies. 4. Popular Traders. 5. Labco	Offered Vendor:	
2	For measurement of carbon dioxide, carbon monoxide & oxygen in furnace flue gases; the apparatus shall include:-		
3	(a) Three test gas manifold & rubber bellow - 1Nos		
4	(b) Three Absorption pipette with fitted glass tubes shall be having total filling capacity 250ml (appr.) & have fine glass tubes for CO ₂ & O ₂ absorption pipette whereas for CO these tubes shall have copper wire with glass tubes		
5	(c) Gas burette complete with outer water jacket, capacity 100ml with bulb at top-1 Nc		
6	(d) Leveling bottle cap. - 250 ml-1Nos		
7	The above items shall be fitted in Good quality wooden cabinet with front & rear sliding doors with lifting handle-1Nos		
8	Accessories		
8.1	Three test manifold & rubber bellow - 3 Nos		
8.2	Absorption pipette - 3 Nos		
8.3	Gas burette - 3 Nos		
8.4	Leveling bottle cap. 250 ml - 3 Nos		

B12 Hydrogen Purity Test Apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Yokogawa India Limited. 2. Honeywell Automation India. 3. Endee 4. Nova analytical limited	Offered Vendor:	
2	Function: Sensing & Measurement of Hydrogen in Air, gas holders, valves, pipelines, etc.		
3	Range : 0 - 100 % purity		
4	Sensor : Thermal Conductivity Detector		
5	Readout : LCD Digital display.		
6	Sampling Method : suction		
7	Alarms : Audio-Visual alarm for LO, Hi ranges & Battery low		
8	Response Time : Less than 10 seconds.		
9	Power : rechargeable batteries + charger		
10	Instrument shall be supplied with all required accessories.		

B13 Bench top TOC analyzer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Shimadzu 2. OI analytics 3. Star 4. Orbit technologies	Offered Vendor:	
2	Bench Top TOC analyzer shall have the following specifications.		
3	Measuring Technique: UV/Heated Persulfate.		
4	Analyzer shall comply with all specifications according to Standard Methods 5310C, EPA 415.2, EPA SW-86 Method 9060A.		
5	The system shall include dual, self-calibrated Non-Dispersive Infrared (NDIR) detectors for maximum sensitivity and durability.		
6	System shall have inbuilt auto sampler with a capacity of 100 vials or more.		
7	Laboratory TOC analyzer shall meet the following specification.		
8	Accuracy: 2% Full scale		
9	Analysis Time: 3 minutes		
10	Particulate handling Up to 750 µm		
11	Linearity ±2% FS, whichever is greater		
12	TOC analyzer shall be supplied with Data Server and User Interface Software, Start-up Kit and Operator's Manuals.		

B14 Flue Gas Analyzer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Aimil Ltd. 2. Orbit Technologies Pvt.Ltd. 3. Kane International Ltd. 4. Mru GmbH. 5. Endee 6. Testo	Offered Vendor:	
2	Flue gas analyzer shall have the following specifications:		
3	Components Measured NOx/SO2/CO/CO2/O2		
4	Analysis Principle		
4.1	O2, CO, NO, NO2, SO2: by Electrochemical		
4.2	CO2: by NDIR		
5	Flue Gas & Air Temperature Measurement: Temperature Sensor		
5.1	O2 Measuring Range: 0 to 25 %		
5.2	CO measuring Range: 0 to 8000/20000 ppm		
5.3	NO Measuring Range: 0 to 4000 ppm		
5.4	NO2 Measuring Range: 0 to 1000 ppm		
5.5	SO2 Measuring Range: 0 to 4000 ppm		
5.6	CO2 Measuring Range: 0 to 20%		
6	Flue Gas Temperature: 0 to 999.9 deg C		
7	Efficiency: 1 to 99.9%		

8	Sample Gas Flow Rate Approx.:1.1 L /min		
9	Display measured value in LCD screen		
10	Instrument shall be battery operated.		
11	Flue gas analyzer shall have internal memory and facility to transfer the data to PC Instrument shall be supplied with all required accessories as a ready to use analyzer.		

B15 Oil Content Analyzer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Horriba ltd. 2. Turner design, USA 3. Orbit technologies	Offered Vendor:	
2	Oil content analyzer with following specification shall be supplied.		
3	Display: LCD		
4	Measurement Method Solvent Extraction		
5	Accuracy Better than 2% of Full Scale		
6	Repeatability Better than 2% of Full Scale		
7	Linear Range: 0 –200/1000 ppm most crudes or dilute sample for higher range Sensitivity: 1 ppm		
8	Calibration: Single-point and blank		
9	Response Time: 5 Seconds		
10	Measures: Diesel, Lube Oil, Fuel Oil, Crude Oil and Gas condensates		
11	Applications: Produced water, Industrial Waste Water, Oil Spill Response.		
12	Minimum Detection Limit : <1 ppm for most oils		
13	Instrument shall supplied with sample cuvettes,2 liter extraction solvent and calibration standard.		

B16 Atomic Absorption Spectrophotometer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Perkin elmer 2. Thermo 3. GBC scientific 4. Orbit technologies	Offered Vendor:	
2	The instrument is required to determine the following elements in solution as listed below:		
2.1	(a) Sodium		
2.2	(b) Potassium		
2.3	(c) Copper		
2.4	(d) Iron		
2.5	(e) Magnesium		
2.6	(f)Aluminum		
2.7	(g)Boron		

2.8	(h) Nickel		
2.9	(i) Mercury		
3	DESCRIPTION		
3.1	The instrument will essentially consist of but not be limited to a source of light emitting the line spectrum of an element (hollow cathodic lamp), a device for vaporizing the sample (burner), a of isolating an absorption line (monochromator or filter and adjustable slit) and a photoelectric detector with associated amplifying and electronic measuring and recording equipment. The instrument will be equipped with all accessories necessary to determine the elements listed above. The instrument will operate on 240V, 50Hz, single phase supply.		
3.2	Name of Equipment: Atomic Absorption Spectrophotometer		
3.3	General: Instrument is required for measurement of concentration of metals and heavy metals in liquids.		
4	Specifications of Equipment:		
4.1	Optics : True Double Beam optical design		
4.2	Monochromator : The system should be based on Echelle Grating/ Aberration Corrected Czerny-Turner Mounting Hollow Graphic Grating or equivalent with grating lines 1600 lines/mm or more		
4.3	Focal Length : 250 mm or more		
4.4	Band width : Variable Band Width from 0.2 to 1.0 nm or 0.2 to 2 nm with automatic switching		
4.5	Detector : Detector technology based on PMT/SSD or equivalent		
4.6	Wavelength : Min :185 – 190 nm; Max : 900 nm		
4.7	Sensitivity : 0.9 abs. for 5 ppm Cu solution		
4.8	Turret : Six lamp turret or more		
4.9	Burner Assembly : Air Acetylene burner head and N2O burner head		
4.10	Software for Parameter Control : All the method parameters related with lamp selection, calibration, control of flow gases should be through integrated software		
4.11	Gas Control : The instrument should have programmable gas controls both for air, N2O and C2H2		
4.12	Software : Software for controlling analyzer, setting-up the method parameters, analyzing the samples and performing calibration		
4.13	Lamps for AAS : Coded Hollow Cathode lamp or better for Automatic recognition & automatic other parameter settings, e.g. lamp current, slit width for following elements- Sodium, Potassium, Copper, Iron, Magnesium, Aluminum, Boron, Nickel, Mercury		
4.14	Standards for calibration : Standards (Reputed Make) be provided for all the elements as mentioned above in pack of 100 ml (min).		
4.15	Background Correction : Deuterium background correction		
4.16	Hydride Vapour Generator System : Heated automatic Hydride Vapour Generator system for the high sensitivity determination of Mercury and metallic hydride forming elements such as Bi, As, Sb, Sn, Se and Te, alongwith sample flask, reagent reservoir and quartz cell, software controlled.		
4.17	Graphite Furnace : Heated Graphite Atomizer system (Temp. Ambient to 3000°C); easy switch over between Flame and Furnace with software controlled Dual Atomiser System. The furnace should have suitable cooling system.		
4.18	Auto Sampler : Auto sampler for Flame and Furnace		
4.19	Fume Extraction System : Equipment should be supplied along with compatible Fume Extraction system		
4.20	Power Source : 230V AC, 50Hz		

4.21	Voltage Stabilizer : 5 KVA or more		
4.22	Provision for gas leak detection with auto flame shut off.		
4.23	Argon cylinder, Acetylene gas cylinder and Nitrous Oxide cylinder along with suitable regulators, colour coded pressure tubings and air compressor should be supplied from reliable/standard Indian source.		
4.24	Computer System : Branded PC & Printer (HCL/HP/Dell/Lenovo) compatible with the software mentioned above with Intel Core i5 or better Processor, 18" or better LED Monitor, Windows 8.1 or better, 4GB DDR3 or better RAM and HDD 1.0 TB or better; Black & White Laser, Printer with speed 25 PPM or better.		
4.25	Detailed printed Catalogue must be provided with the offer submitted alongwith undertaking from the vendor to supply the genuine make equipment. The certification in this regard from OEM shall be required at the time of supply of equipment.		

B17 Constant Temperature Bath

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Reputed Indigenous make	Offered Vendor:	
2	This shall be used to maintain the temperature of the water in the temperature range 5 deg. C above ambient to 100 deg. C. Accuracy of temperature control shall be ± 0.01 deg. C.		
3	The tank shall be of stainless steel with stainless steel (or) aluminum housing and a glass view panel. An electric heater with digital temperature indicator cum controller shall be provided. Suitable capacity pump / stirrer shall be provided for the circulation/ agitation of the tank media. Capacity of the tank shall be minimum 25 litres. This temperature bath shall be supplied with necessary accessories.		

B18 Water Distillation Assembly

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Reputed Indigenous make	Offered Vendor:	
2	The double distillation unit shall consist of suitable capacity electrical heaters. Body shall be glass. Capacity of the plant shall be 2.0 lph and a storage tank of capacity 10 ltrs shall also be supplied to store the distilled water.		

B19 Vacuum Pressure Pump

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha 2. Divya 3. Macro 4. Popular	Offered Vendor:	
2	Teflon diaphragm based oil-free, portable AC powered vacuum pump for Lab use operating on 230V / 50 Hz.		
3	Accessories:		
3.1	Cellulose nitrate membrane filter dia 47mm, pore size 0.45 μ m Qty- 4Packets (each packet having 100 filters)		
3.2	All glass filter holders-47mm borosilicate glass filter holder for vacuum filtering of aqueous liquids with clamp, All parts contacting liquid are borosilicate glass with ground glass sealing surface Qty-2 set		

B20 Heating Mantle for Oil Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Divya 2. Yorco 3. Macro 4. Popular 5. Hindustan	Offered Vendor:	
2	Heating mantel (Single unit) which can withstand high temperature up to 350 deg. C with energy regulator and can hold flask size of 2 liters.		

B21 Magnetic Stirrer cum hot Plate

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Magnetic stirrer shall be provided with a stainless steel hot plate. The heating energy shall be controlled by stepless speed and energy regulator.		
3	Max speed: 1200 RPM, Stirring Capacity 2 liters.		

B22 Lab Refrigerator

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: Reputed indigenous make	Offered Vendor:	
2	Standard Laboratory Model		
3	Quantity - One (1) No for storage of chemicals & one (1) no for storage of samples.		
4	Type : Electrically operated with freezer, chill trays, crispators and provided with magnetic doorlatch, pilot bulb, thermostat temperature control, automatic voltage stabilizer, leads, plugs , Double door with auto defrosting etc.		
5	Capacity : 230 litres		
6	Voltage : 230V AC nominal with input voltage range		

B23 Hot Plate

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Hot Plate for continuous heating up to 350 deg. C with cast iron top Size: 200 mm x 300 x 150 mm		

B24 Magnetic Stirrer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	A magnetic stirrer or magnetic mixer is a laboratory device that employs a rotating magnetic field to cause a stir bar immersed in a liquid to spin very quickly, thus stirring it.		
3	TECHNICAL SPECIFICATIONS :		
3.1	Magnetic Stirrer should be electrically operated.		
3.2	It should be fitted with a speed regulator with maximum speed of 1200 RPM.		
3.3	Top plate should be made of stainless steel.		
3.4	Capacity – 2 Litres		
3.5	The magnetic stirrer should be supplied with Teflon coated stirring bar.		
3.6	The magnetic stirrer is required without hot plate.		

B25 KIPP'S Apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Borosil glass works 2. Wishwani 3. Jain scientific 4. Galaxy Trading Corporation	Offered Vendor:	
2	Kipp's apparatus, also called Kipp's generator, is an apparatus designed for preparation of small volumes of gases.		

3	The apparatus is made of three vertically stacked cylinders. The solid material is placed into the middle cylinder; the acid is put into the top cylinder. A tube extends from the top cylinder into the bottom cylinder. The middle cylinder has a tube with a stopcock attached, which is used to draw off the evolved gas. When the stopcock is closed, the pressure of the gas in the middle cylinder rises and expels the acid back into the top cylinder, until it is not in contact with the solid material anymore, and the chemical reaction stops.		
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B26 Photometer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Orlab 2. Reputed imported make	Offered Vendor:	
2	Colorimeter shall have pre programmed methods for common water and boiler water parameters like iron, Silica, Phosphate, Hydrazine, Copper and Iron etc., Colorimeter shall be used for both field as well as laboratory testing.		
3	Colorimeter shall be supplied with following:		
3.1	Eight sample cells		
3.2	Silica Reagent set for 500 tests		
3.3	Iron Reagent set for 500 sets		
3.4	Hydrazine reagent set for 500 tests		
3.5	Copper reagent set for 500 tests		
3.6	Phosphate Reagent set for 500 tests		
3.7	Micro pipette with tips		
3.8	Carry case		
3.9	Instructions Manual		

B27 Potentiometric Titration Apparatus

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialitics Pvt. Ltd. 2. Analytica Equipments(I) Pvt. L. 3. Spectralab Instruments Pvt. 4. Orbit Technologies Pvt.Ltd. 5. Metrohm Ag. 6. Equivalent	Offered Vendor:	
2	Potentiometric titration is a technique similar to direct titration of a redox reaction. No indicator is used; instead the voltage across the analyte, typically an electrolyte solution is measured. To do this, two electrodes are used, a neutral electrode and a standard reference electrode. The voltage is recorded at intervals as the titrant is added		
3	Name of Equipment : Potentiometer Titration Apparatus		
4	SPECIFICATION OF EQUIPMENT : The potentiometer Titration Apparatus is required with the		
5	Functions : Potentiometric Titration		
5.1	Karl-Fischer Titration		
5.2	pH/m V measurement		
5.3	Temperature measurement		
5.4	Temperature compensation for pH		
5.5	Dispenser (Delivery pump)		

6	Titration Modes Acid-base titration					
6.1	Redox Titration					
6.2	Karl-Fischer Titration					
6.3	Curve (Constant rate) titration					
7	Measuring :	Parameters	Range	Resolution	Accuracy	
7.1		pH	0.0 to 14.0	0.003pH	±0.01	
7.2		mV	± 0.0 to 1999	0.1 mV	±0.5 mV	
7.3		Temperature	0.0 to 100	0.1°C	±1°C	
8	pH Calibration pH calibration, with Standard Buffer or user selectable standard with Auto or Manual Temp. compensation.					
9	Solution Dispensing Mechanism Highly accurate sipper pump with auto calibration					
10	Display Range & Resolution of volume dispense 99.9 ml with 0.001 ml resolution by using statistic analysis.					
11	Moisture content calculation 0.0 to 100%					
12	Calibration In built automatic KF factor calculation facilities after standardization the KF reagent.					
13	For KF Factor One can use same factor for different sample or can restandardize the KF reagent.					
14	Stirrer In built Magnetic Stirrer with adjustable speed					
15	End Point Alarm After titration is over it gives audible deep.					
16	Time for End Point 0 to 50 Second hold time. When endpoint is achieved, unit waits for stable end point.					
17	Display & Keyboard LCD digital display and soft touch keyboard with 20 keys.					
18	Print Provision for printing data be provided.					

B28 Gas Heating Assembly

Sl. No.	Technical Requirement		Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor:	1. Reputed Indigenous make	Offered Vendor:	
2	The Gas Heating Assembly (Gas Stove) should conform to IS: 4246.			
3	It should be a Double Burner Cooking Gas Stove without cover and with Non-Automatic Ignition System.			
4	Size – Approx. Dimensions (when packed) 690 x 370 x 110 mm.			
5	It should be sleek, streamlined, high efficiency with stainless steel body.			
6	It should have brass burner tops and stainless steel drip-trays.			
7	It should have one small burner and one big burner.			
8	Detailed printed leaflet be supplied along with quotation.			

B29 Stop Watch

Sl. No.	Technical Requirement		Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor:	1. Reputed Indigenous make	Offered Vendor:	
2	Stop Watch 1/100th of second, Digital with date, time and one lap function from Reputed indigenous make			

Compliance Sheet [Package - 3]

C1 - Proximate analyzer

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Orbit Technologies Pvt.Ltd. 2. Leco Corporation. 3. Precisa Gravimetrics Ag.	Offered Vendor:	
2	Proximate Analyzer (Thermo Gravimetric Analyzer) for coal and coke, graphite etc shall have the		
3	Shall be able to analyze 1 to 19 samples (19 samples + 1 reference) UNATTENDED.		
4	To determine moisture, volatiles, fixed carbon, ash, and LOI.		
5	Furnace Temperature Range: 50 – 1000 deg C		
6	Sample Size: 0.1 – 10 grams		
7	Standard Deviation: +0.0002 grams		
8	Weight Loss/ Gain Range: 0-100%		
9	Temperature stability: ± 1 °C at 105 and ± 2 °C at all other higher ranges controlled with		
10	Shall have Dual Ceramic carousels, fully automatic with placement & removal of crucible –		
11	All heated parts shall be ceramic - carousels, crucibles, pedestal, covers.		
12	Ramp rate of 50 deg C/min. at 230 V/50 Hz, for volatile measurement, required as per ASTM D-		
13	Programmable ramp rates 25 °C to 107 °C 5 ~ 30°C/min, 104 °C to 1000 °C 5~ 50°C/min, 550°C		
14	Automatic restart after power failure		
15	Built-in Analytical Balance 120gms, accuracy: 0.1 mg		
16	Selectable methods configurations for ISO, ASTM, DIN etc		
17	Compressed air assisted cooling for faster cool down		
18	The system shall be operated with Windows based software with 8 editable programs, 50		
19	Operating Voltage: 20A 220 VAC 50/60 Hz Furnace capacities: 6 kW		
20	Instrument shall be supplied with 20 no's ceramic crucible and covers, Computer, printer etc		

C2 - Oxygen Bomb Calorimeter for Coal Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Parr Instrument company/ Orbit 2. Leco Corporation	Offered Vendor:	
2	Automatic bomb calorimeter shall have following specifications:		
3	Type: True Isoperibol with jacket temperature controller to a precision of 0.1°C Instrument:		
4	Measurement Range: 1,000 K Cal /Kg to 8,000 Kcal / Kg for 1 gm of Sample.		
5	Precision: 0.1 % RSD or better		
6	Repeatability / Reproducibility: As Per BIS 1350 (Part –2), 1970, ASTM D-5865/04 & DIN 51900		
7	Resolution : 0.0001 Cal/gm		
8	Analysis Mode: Equilibrium mode / Dynamic mode or any other mode. Temperature Measuring		
9	Removable bomb and bucket type (in order to meet BIS standard)		
10	Display: Color touch screen with graphical user interface		
11	Correction: Spiking, Ash/ Nitrogen or Acid, Fuse wire, Sulphur and Hydrogen.		

12	Memory Capacity: Minimum 1,000 tests results or more.		
13	Computer / Printer/ Balance Connection: RS 232 Interface		
14	Sample Crucible Capacity: 0.5 gm – 1.5 gm.		
15	Power requirement: 230 VAC +/- 10 %, 50/60 HZ As per Indian condition. Processing Capacity:		
16	Standard Accessories:		
16.1	Oxygen bomb: The oxygen combustion bomb shall have permanent fuse wire and made with		
16.2	One set mandatory spares to be supplied Electronic Balance (0.0001gram readability) with		

C3 - Muffle Furnace for Coal Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Hindustan Apparatus Mfg. Co.	Offered Vendor:	
2	Heating elements shall be of KANTHAL wire in coil form wrapped on the muffle, embedded in		
3	Size: 20 x 20 x 30 cm		
4	Accessories:		
4.1	Two (2) numbers each of stainless steel tongs of sizes 15 & 24 inch		
4.2	One (1) spare heating element		

C4 - Oven for Coal Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Vortex Electronics Pvt Limited. 8. Hindustan Apparatus Mfg. Co.	Offered Vendor:	
2	Range: Electrically operated outer chamber made of mild steel & inner chamber made of		
3	Temp. Range 5deg.C above ambient to 250deg.C Max. temp. Accuracy : +/- 2deg.C		
4	Size: 60X60X90cm		
5	Accessories:		
5.1	Two (2) mercury thermometer, range 40 to 250 °C		
5.2	Twelve (12) silica crucible of 50ml capacity, with lid		
5.3	Temp. Sensor		
5.4	Heating element		

C5 - Lab Pulversier for Coal Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Testing Instruments. 2 .S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Lab pulverizer Which can be mounted and securely bolted on steel stand with main drive pulley,		

C6 - Sieve Shaker for Coal Analysis

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Testing Instruments. 2 .S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Electrically operated Ro-Tap sieve shaker will be furnished to accommodate seven 50mm		
3	The shaker will be provided with a timer switch so that the test is automatically terminated after		
4	Accessories:		
4.1	Two (2) polished brass lid and pan for the above sieves of 200mm diameter		
4.2	Sieves; 850microns, 710microns, 600microns, 500microns, 425 microns, 355 microns, 250		

C7 - Jaw Crusher

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Testing Instruments. 2 .S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders	Offered Vendor:	
2	Jaw size: 100X150mm		
3	Maximum feed size: upto 50 mm		
4	Product size: 5 to 15 mm		
5	Capacity: 100 to 200 kg/Hr		

C8 - Roll Crusher

<u>Sl. No.</u>	<u>Technical Requirement</u>	<u>Offered Specification (Bidder to Specify against each Particulars)</u>	<u>Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)</u>
1	Approved Vendor: 1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	The machine is to be provided with hopper of suitable size fabricated from mild steel sheet.		
3	Maximum feed size: 8 mm		
4	Product size: 1mm to 2 mm		

C9 - Humidity Oven

<u>Sl. No.</u>	<u>Technical Requirement</u>	<u>Offered Specification (Bidder to Specify against each Particulars)</u>	<u>Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)</u>
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Vortex Electronics Pvt Limited. 8. Hindustan Apparatus Mfg. Co.	Offered Vendor:	
2	Temperature range: + 50 C to 600 C		
3	Accuracy: ± 1 deg. C		
4	Temperature and humidity controlled by digital temperature controller cum indicator- LED (dual		
5	Type : Standard laboratory model.		

C10 - Coal Sample Riffler

<u>Sl. No.</u>	<u>Technical Requirement</u>	<u>Offered Specification (Bidder to Specify against each Particulars)</u>	<u>Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)</u>
1	Approved Vendor: 1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Riffle Sample divider: Should consist of metal box fitted with series of chutes of equal width		
3	Slot Width: 13 mm		
4	No. of Slots: 14		
5	Capacity: 2.1 DM3		
6	Ambient Condition: Equipment shall be suitable for operation in ambient temperature from 0-50		

C11 - Furnace for Determination of Volatile Matter

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Usha Instruments & Chemicals. 2. Jain Scientific Glass Works. 3. Divya Remedies. 4. Yorco Sales Pvt. Ltd. 5. Narang Scientific Works Pvt. 6. Macro Scientific Works (Regd.). 7. Hindustan Apparatus Mfg. Co.	Offered Vendor:	
2	Maximum operating Temperature -1000°C		
3	Temperature sensor required - Thermocouple Type N mineral insulated		
4	Over temperature protection sensor-Required		

C12 - Abrasive/Erosive index machine

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Main Equipment: The main equipment should comply with IS 9949-1986 Re affirmed 1994,		
3	The equipment should be able to handle high ash coal (upto 45% ash)		
4	Mill Pot: Mill pot or Motor should be of Steel.		
5	Blade Assembly: Blade assembly should consist of four number of carbon steel blades.		
6	Driver unit: Driver unit to be fitted with 2.5 to 3 HP, three phase motor to run at 1450 RPM.		
7	Gauges: Gauges for checking the gap between the edges of the blade and internal wall bottom		
8	Accessories: Sieves having nominal aperture / perforated plate having size of 6.3 mm, 12.5 mm		
9	Painting: The machine shall be painted with two coats of red oxide primer and two coats of light		
10	POWER SUPPLY: 220 volts A.C 3 phase, 50Hz		
11	AMBIENT CONDITION: Equipment shall be suitable for operation in ambient temperature 0 to 50		

C13 - Laboratory plate mill

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Plate Mill: Disc type grinder to grind coal sample to produce about 600 microns (25 mesh) in one		
3	Disc: Should have rotating disc having planetary motion in the vertical plane. The disc should be		
4	Size Reduction: The plate should reduce 450-500 gm sample of coal to 100 mesh in one min or		

5	Motor Capacity: 1 HP, Triple V-belt pulley drive and proper mounting		
6	Power Supply: 3 phase, 50 Cycles, 440 Volt, AC supply		
7	Feed Size: 5.0 mm		
8	Ambient Condition: Equipment shall be suitable for operation in ambient temperature from 0-		

C14 - Raymond mini mill

Sl. No.	Technical Requirement		Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor:	1. Testing Instruments. 2. S.D. Instruments & Equipments. 3. Usha Instruments & Chemicals. 4. Divya Remedies. 5. Yorco Sales Pvt. Ltd. 6. Macro Scientific Works (Regd.). 7. Popular Traders.	Offered Vendor:	
2	Mini Mill: Should be swing type pulveriser designed to powder laboratory samples to 100- 150			
3	Powdering Device: Should have swing hammer type pulveriser design. The hammer to be fitted			
4	Size Reduction: The mini mill should be able to reduce the size to 10 -100 mesh size.			
5	Motor Capacity: 0.5 HP, Triple V-belt pulley drive I direct coupled & mounting			
6	Power Supply: 3 phase, 50 Cycles, 440 Volt, AC supply			
7	Ambient Condition: Equipment shall be suitable for operation in ambient temperature from 0-			

C15 - Analytical Single Pan Balance

Sl. No.	Technical Requirement		Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor:	1. Merck Specialist Pvt. Ltd, 2. CAS weighing India Pvt. Ltd, 3. Analytica Equipments (I) Pvt. Ltd, 4. Tula Digital (I) Pvt. Ltd, 5. Vortex Electronics Pvt. Ltd, 6. Avon Corporation Ltd, 7. Precisa Gravimetrics AG, 8. Shimadzu (Asia Pacific) PTE Ltd	Offered Vendor:	
2	Capacity: 200 gm			
3	Accuracy: 0.1 mg			
4	Type of display: Digital display			
5	Operating Temperature: 10-45OC			

C16 - Ordinary Balance

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Merck Specialist Pvt. Ltd, 2. CAS weighing India Pvt. Ltd, 3. Analytica Equipments (I) Pvt. Ltd, 4. Tula Digital (I) Pvt. Ltd, 5. Vortex Electronics Pvt. Ltd, 6. Avon Corporation Ltd, 7. Precisa Gravimetrics AG, 8. Shimadzu (Asia Pacific) PTE Ltd	Offered Vendor:	
2	Capacity: 4000 gm		
3	Accuracy: 0.1 gm		
4	Type of display: Digital display		
5	Operating Temperature: 10-45OC		

C17 - Ash Fusion Analyser

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. IR technologies (Leco), Leco USA, 2. Orlab instruments pvt ltd (Sylab), 3. Sylab France	Offered Vendor:	
2	An automatic ash fusion system for the determination of the ash fusion points of ash derived		
3	The software of the system shall clearly show the sample images for IDT, ST, HT and FT as per		
4	System shall use the most modern technology for monitoring, computing, storing results and		
5	The ash fusion system have the below technical specifications.		
6	Maximum Temperature: 1600 deg C		
7	Temperature ramp rate shall meet ASTM and ISO norms		
8	Resolution 10 deg. C		
9	Specific temperature determination precision 200deg. C		
10	6 samples simultaneously analyzed, fully automatic, the analyzer can run overnight (3 runs / day)		
11	Heating Element: Silicon carbide		
12	The system can able to analyze the specimen shapes of all ISO & ASTM defined specimen		
13	Image collection of individual sample 10 deg. C by 10 deg. C, image collection of whole camera		
14	The system shall be operated through an external or embedded PC through windows		
15	Appropriate software shall be provided for automatic operation of the instrument and storage of		
16	There shall be provision for operating the system at various atmospheres such as oxidizing or		
17	Auto shut off facility of furnace and gases after completion of the test.		
18	The instrument will have proper ventilation facility of hazardous gases.		
19	Automatic light off mode during the test for clear examination of fusion points of the samples		
20	Power supply: 220 VAC, 50 Hz		
21	The complete system shall be supplied with Furnace, External CCD camera with IR filter, Tray-S		

C18 - CHNS Analyser

Sl. No.	Technical Requirement	Offered Specification (Bidder to Specify against each Particulars)	Document attached in Support of Offered Specification (Catalogue / Confirmation by OEM)
1	Approved Vendor: 1. Thermo 2. Leco 3. Orbit Technologies	Offered Vendor:	
2	It shall be based on the principle of dynamic Flash combustion (Modified Dumas Method),		
3	System shall not have Adsorption Filter in the Pathway for trapping Moisture.		
4	Shall be Field upgradeable to O in future with the changes only in Furnace, reactors and		
5	The flows of both gases shall be controlled by Electronic Flow meter which is Temperature		
6	The Instrument shall have Mimic screen indication the status of the Parameters like Furnace,		
7	Furnace / Combustion Temperature:		
7.1	CHN-1000 deg. C and around 1800 deg. C during combustion of sample		
7.2	The Analyser shall have the facility of viewing the flash of combustion of the sample.		
8	Software shall be capable of full instrument control, data acquisition, processing, reprocessing,		
8.1	- shall be compatible with Windows™ 2000, XP and Vista operating systems		
8.2	- Flash EA Methods (CHN, CHNS etc) preset		
8.3	- Oxy Tune Function (oxygen dosing system by Electronic Flow Controller Thermo-		
8.4	- User compound library		
8.5	-Automatic Heat Value Calculation (i.e. GHV and NHV) for solid and liquid fuels		
8.6	- Automatic Minimum Formula Calculation (for fine chemicals and synthesis products)		
8.7	- Maintenance control program		
8.8	- Wake up, start up and shut off functions		
8.9	- LIMS compatibility		
8.10	- LAN Compatibility		
8.11	- Data Export/Import – ASCII Report file		
8.12	- Data Export/Import – Excel summary Result file		
8.13	- Automatic Leak Test		
8.14	- “Green Light / Red Light”: green or red light shows at glance if the data obtained are within the		
8.15	- Automatic Evaluation of the Empirical Formula:		
8.16	- 21CFR part 11 compliant		
9	Detector range (for C; H, N, S) : 0.01 % to 100%		
10	Sample size: 0.01 – 100 mg (according to the sample nature) Analysis time: CHNS 12 min,		
11	Theoretical Value : Experimental Value		
11.1	0.01 % (100 ppm) : 100 ppm ± 10		
11.2	0.001 : 0.1 % ± 0.01		
11.3	0.01 : 1.00 % ± 0.02		
11.4	0.1 : 10.00 % ± 0.1		
11.5	0.5 : 50.00 % ± 0.3		
11.6	0.9 : 90.00 % ± 0.3		
12	Conformance tested by pure organic elemental analysis standards Utilities		
13	Helium: GC grade, He flow: 140 ml/min (measurement channel) and 100 ml/min (reference)		
14	Oxygen: 99.995 % purity		

15	In Stand-By condition the Helium flow shall decrease to 10 ml/min while the Oxygen flow		
16	Sample Feeding:		
16.1	Built in Auto sampler for solids & liquids with minimum 32 samples in a single tray, of solid or		
16.2	The Autosampler shall be fully motorized and shall not require servo air as utility.		
17	Safety standards		
17.1	Safety CEI EN 61010-1; 1994+A2:1996+ CEIEN 61010-2-010: 1995		
17.2	+A1:1997 According to EEC Directive n. 73/23 modified by EEC Directive n. 93 /68		
18	Electromagnetic compatibility		
18.1	CEI EN 55011: 1991 + A1: 1997+A2: 1996 and EN 50082-2: 1995 and EN 61000-3-2:1995+A13:		
18.2	Test Method – as per ASTM D 5291, ASTM D 5622, ISO / TS 12902, Solid mineral fuels –		
19	Specification for Electronic Microbalance		
19.1	Capacity: 6.1 g		
19.2	Resolution: 1ug [linear throughout the range up to 6.1g]		
19.3	Repeatability: 0.8 ug / 0.6 ug (0 ...2g)		
19.4	Linearity: 4 ug (0 ... 2g) Stabilization time: 8 ... 12 sec		
19.5	Display: Touchscreen, removable display		
19.6	Menu: Touchscreen operated 7 languages with info field and functions keys		
19.7	Interface: 1 RS232 standard.		
19.8	Slot for an optional second interface:RS232, LocalCan and Minimetler		

Terms & Conditions of Reverse Auction

Against this enquiry for the subject item with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit „online sealed bid“ in the Reverse Auction. Non-submission of „online sealed bid“ by the bidder for any of the eligible items for which techno- commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. 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.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. 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.
7. 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, Service Tax for Services 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.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL"s standard practice.
12. Bidders shall 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. In case BHEL decides to go for reverse auction, the H1 bidder (s) (whose quote is highest in online sealed bid) may not be allowed to participate in further RA.



BHARAT HEAVY ELECTRICALS LIMITED

HEEP-HARIDWAR, UTTARAKHAND (249403)

General Instructions and Standard Terms & Conditions for bidding against Tender Enquiry (GISTC) For Foreign Bidders (Version June-2017, Rev: 01)

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23. NOTE.

1. GENERAL.

These general terms & conditions shall apply to all the Tender Enquiries, notice inviting tenders, request for quotations concerning the supply of goods and / or rendering of services to Bharat Heavy Electricals Ltd., HEEP, Haridwar (hereinafter referred to as BHEL or the Purchaser).

2. ORIGIN OF QUOTATION.

- a) The quotation should preferably be from the principal bidder. However tender specific authorized registered dealer / agent can also submit the bid on

their behalf, failing which the quotation is liable to be ignored. BHEL prefers to deal directly with the principal manufacturers.

- b) An agent cannot quote on behalf of more than one principal in the same Tender Enquiry.

3. SUBMISSION OF TENDER.

- a) Bid / Quotation must be enclosed in sealed cover on which tender enquiry number and the due date MUST BE written and be invariably sent under REGISTERED POST / SPEED POST / COURIER / Dropped in the Tender Box: addressed as follows:-

Quotation Against Enquiry No. _____

Dated: _____

Due on: _____

To,
THE HEAD OF MATERIALS MANAGEMENT,
Heavy Electrical Equipment Plant,
Bharat Heavy Electricals Limited,
HARIDWAR-249403 (Uttarakhand), INDIA.

- b) In case of Three / Two Part Bid, technical bid containing technical offer, duly signed; and un-priced copy of the Price Bid should be kept in one envelope. Price Bid containing only the price should be kept in a separate envelope. All envelopes indicating Part-1 or Part-2 or Part-3 as the case may be to be put in a bigger envelope. Please note that un-priced bid should be the exact replica of price bid but without prices.
- c) The bid / quotation must be posted before due date, keeping allowance for postal transit time. Alternatively, the tenders duly sealed and super-scribed as above may be deposited in the Tender Box. Quotations sent by any mode but not received

Quotations / Bids not in accordance with General Instructions and Standard Terms & Conditions are likely to be ignored.



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in time will be ignored. Tender received through authorized E-mail is also acceptable. However, in time submission of tender in tender box shall be the responsibility of the bidder, sent through any mode. Documents submitted with the offer / bid shall be signed and stamped in each page by authorized representative of the bidder.

- d) Any additional documents submitted by supplier / bidder, during processing of registration application / tender or after placement of order shall not be accepted unless it is submitted with forwarding letter and duly signed and stamped as mentioned above in clause c.
- e) The bids of the bidders who are on the banned list and also the bids of the bidders, who engage the services of the banned firms, shall be rejected. The cutting / overwriting in the bid / offer must be duly attested by the signatories to the bid. The list of firms banned by BHEL is available on BHEL web site www.bhel.com.
- f) Being PMD vendor, if you are not quoting against this tender enquiry, please send your regret letter positively for our reference with valid reasons for not participating in the tender enquiry. Repeated lack of response on the part of bidder may lead to deletion of such PMD vendor from BHEL's approved vendor list.
- g) The bidders will submit Integrity Pact, duly signed by its authorized signatory, along with their bids wherever estimated tender value is Rs. 5 Crore or more.
- h) In case of open tender, the unregistered bidder shall submit inter alia duly filled-in Supplier Registration Form (SRF) along with the bid. Bidders can download the SRF from www.bhel.com

- i) BHEL reserves the right to award tendered quantities among more than one bidder (after acceptance of L1 price by the other bidders). BHEL can also consider awarding of part of the tendered quantity to other than L-1 bidder at L1 counter offered rates, if the quantity offered by the L-1 bidder is less than the quantity tendered for.
- j) BHEL may also reduce the Tender Quantity for offering it to Micro & Small Enterprise (MSE) Indian Vendors as per applicable Government of India rules whose prices are within 15% of L1 prices as per directives of Government of India.

4. TENDER OPENING.

Tender opening is scheduled to start in the Tender Room at 2:00 PM, on the due date. Therefore bid/quotations must reach this office / tender Box latest by 1:45 PM on due date. Only participating bidders are allowed to attend tender opening. **TENDERS RECEIVED AFTER THE SPECIFIED TIME OF THEIR 'SUBMISSION' WILL BE TREATED AS LATE TENDERS AND SHALL NOT BE CONSIDERED UNDER ANY CIRCUMSTANCES.** The bidders or their authorized representatives may be allowed to attend tender opening if duly authorized by their principals, through a tender specific letter, for price bid opening on that particular day. General authorization letter is not acceptable.

5. SPECIFICATION, DRAWINGS & STANDARD.

- a) Bidders must give their detailed specification in the quotation along with relevant technical literature / catalogue etc. against the tender enquiry.
- b) The Bid should be accompanied with relevant copies of catalogues, drawings or specification as per tender enquiry. If these documents are not furnished, the offer is liable to be rejected.

Quotations / Bids not in accordance with General Instructions and Standard Terms & Conditions are likely to be ignored.



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- c) Wherever national / international (N/IN) standards are referred, the latest N/IN standards are to be followed. Mention year & date of standard revision that shall be followed for the supply.
- d) All Drawings and Standards are proprietary of BHEL. It must not be used in anyway detrimental to the interest of the company.

6. PRICE SCHEDULE.

- a) Kindly quote your prices in figures and words both. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 status.
- b) Prices quoted should not be more than the prices quoted to any other BHEL units / offices / divisions. Vendor to submit copy of latest Purchase Order placed by any unit of BHEL for similar items in the technical bid. In case no order has been placed on such items, specific confirmation that no order has been placed on such items should be provided.
- c) Bidders need to quote their prices on CFR any sea port in Mumbai or FCA basis to the named airport in Euro / USD / JPY / UK Pound / SF / Singapore Dollar or any other Internationally freely tradable currency only. The name of the currency should be clearly indicated in your bids.
- d) Offers received other than CFR basis may result in non-consideration of such bids.
- e) However if BHEL agrees to accept the FOB condition, to arrive at landed cost at our plant / site, the FOB prices shall be loaded for 3% (of FOB Value) towards marine insurance, port handling charges & inland freight or actual freight / port handling charges as per BHEL contract whichever is higher.

f) Basis of Evaluation for Bid / Quotation in foreign currency:

- I. Currency exchange rate (TT selling rates of SBI) for evaluation of the bid/quotation received in foreign currency will be as follows:
- II. Single part bid – Date of tender opening.
- III. Two / Three part bid – Date of part 1 opening.
- IV. Reverse auction – Date of part-1 opening.

NB: Financial evaluation of L1, L2 ----- status will be on the basis of Landed Cost to BHEL.

g) Evaluation of Indian Agents Commission:

- I. BHEL prefers to deal directly with foreign bidder, wherever required, for procurement of Goods. However if the Foreign Principal desires to avail services of an Indian Agent then the Principal should ensure compliance to applicable guidelines.
- II. The FOB / CIF price quoted will be deemed to be inclusive of Indian Agency commission. Agency commission if payable shall be converted to Indian Rupees at TT buying rates of exchange ruling on tender opening date which shall not be subjected to any further exchange rate variation, as disclosed by the bidder in his quoted FOB / CIF price will be paid in Indian Rupees on receipt & acceptance of Materials or it's installation at destination, as the case may be. The lower of the TT buying rate prevailing on the date of technical bid opening shall be considered for computation of Agency commission.
- III. In a tender either the Indian Agent on behalf of Principal / OEM or the Principal / OEM itself can bid, but both cannot bid simultaneously for same item / product in the same Tender. If both OEM and its authorized agent submit their bids

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BHARAT HEAVY ELECTRICALS LIMITED

HEEP-HARIDWAR, UTTARAKHAND (249403)

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separately in that case only the offer of OEM can be considered as an exception.

h) While submitting your bids please clearly indicate:

- I. Expected weight of goods (lots wise).
- II. The size of packed goods.
- III. Whether the goods can be dispatched in containers?
- IV. Port of Loading.
- V. Port of Discharge.

7. REVERSE AUCTION.

- a) BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after Techno-Commercial Evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides for RA. Detailed guidelines available at our site www.bhel.com
- b) In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-Submission of 'online sealed bid' by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

8. DELIVERY TERMS.

- a) Goods shall be dispatched by sea, unless stated otherwise in the tender enquiry or purchase order.

- b) In the event of bidder offering CFR delivery terms for delivery in FCL (Full Container Load), the bidder shall provide 21 days' time free of detention for General Purchase Container / High Cube Container and 14 days for the other types from the date of delivery at delivery port. Wherever the detention free period offered is less than the above specified period, the consequential cost at port of clearance shall be to the account of the bidder. Number of detention free days must be mentioned on Bill of Lading (BL).
- c) In case of CFR delivery, Port congestion charges or any additional charges claimed by shipping line till delivery at destination port shall be to the bidder's account.
- d) Specifically confirm your agreement to change the mode by Air at BHEL's request as per mutually agreed terms even after placement of Purchase Orders.
- e) The Trans-shipment is not permissible in case of Break Bulk Cargo. In rest of the case Trans-shipment condition in BHEL purchase order / letter of credit will be as per Uniform Custom and Practice for documentary credits, UCP 600 of International Standard Bank proceed re-issued by International chamber of Commerce (ICC).
- f) No demurrage / godown rent will be payable to the vendor / vendor's transporter for any delay in payments attributable to the vendor.
- g) The shipping line should be ready to move the containers to consignees nominated CFS (Container Freight Station) yard and Indian agent of shipping line should issue Cargo Arrival Notice (CAN) 7 days in advance for filing the IGM (Import General Manifest) at discharge port.

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- h) In case of CFR contract, bidder to supply the material through a Certified Sea worthy vessel.
- i) A certificate of origin (COO) sanctioned in country of origin from chamber of commerce of the manufacturing country is mandatory to be provided. However a certificate of origin (COO) from the countries under the restricted list of Govt. of India will not be acceptable.
- j) For reasons of delay in receipt of documents from suppliers or due to the same being found to be incomplete, and / or faulty, the suppliers shall be responsible to reimburse in all demurrages / wharfages, if any paid by BHEL (for stated reasons).
- k) **The invoices being issued by shipping lines must be in the name of BHEL. Otherwise, BHEL will have to forego Input Credit on GST.**
- l) While booking the shipment, bidder to also finalize **destination charges** and the same should appear over BL or agreed tariff to be provided to BHEL before arrival of shipment.
- m) If cargo is stuffed in container then the same should be allowed to be moved to CFS of importers choice without any additional charges.
- n) Load port charges shall be settled by the supplier and not be passed on to BHEL in form of destination charges.
- o) NNDs (Non Negotiable Documents) (preferably with OBLs) should be sent at least 7 days in advance i.e. 7 days before the arrival of vessel so as to enable BHEL to move the containers to JWC CFS.
- p) **Information related to OBL / AWB Documents:**
- I. Consignee name and address should be same as mentioned in the Purchase order.
- II. Notify party: Name and address will be as follows :(For discharge port Mumbai or Nhava Sheva)
Bharat Heavy Electricals Limited
14th Floor World Trade Centre-1, Cuffe Parade, Colaba, Mumbai -400005
Email: msseahwr@bhel.in &
ppximx@bhelhwr.co.in (in case of Sea Shipments)
Email: msair@bhel.in and
ppximx@bhelhwr.co.in (in Case of Air shipments)
For latest updating please refer our web site:
www.bhelhwr.co.in
- III. OBL should clearly mention the Indian agent address and contact details.
- IV. OBL should be issued as per UCP 600.
- V. In case of incoterms other than FOB, OBL should mention the container detention free period.
- VI. In case of placement of an Order, BHEL requests bidder to supply one Original Bill of Lading / AWB directly to their Mumbai office with other non-negotiable documents to ensure timely clearance of goods. The other Original Bill of Ladings may be routed through bank based on the other agreed terms and conditions of purchase order.

9. PENALTY FOR LATE DELIVERY.

- a) Date of delivery will be considered as per the delivery terms mentioned in the Purchase Order. Penalty will be applicable on total order value @0.5% per week or part thereof subject to maximum of 10% of the PO value unless otherwise specified in Special Conditions of tender enquiry. Acceptance / Non Acceptance of this CONDITION

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must be specifically mentioned in your quotation. Any deviation from this will be loaded accordingly i.e. BHEL shall load maximum penalty under penalty for late delivery Clause, to the extent the same is not agreed by the bidder, for the purpose of evaluation.

- b) Bidders are requested to quote the best delivery meeting the delivery requirements. BHEL reserves the right to reject the offers not meeting BHEL's delivery requirement.
- c) Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.
- d) Bidder shall deliver the goods in the manner and schedule agreed under the terms and conditions of Purchase order.
- e) The delivery date for penalty purpose will be the Bill of Lading Date / Air way bill.

10. PAYMENT TERMS.

- a) BHEL's standard payment term is Payment after Receipt and Acceptance of Material / Item at HEEP, BHEL-Store or at desired destination unless otherwise specified in Special Terms attached to the tender enquiry.
- b) BHEL reserves the right to accept or reject the offer of the bidder who quotes the payment term other than BHEL's standard payment term.
- c) Loading on account of deviation in payment terms shall be done as per extant rules of BHEL-Haridwar.
- d) Where the payments are through bank, the documents may be presented for negotiation through BHEL designated banks which will be

specified in Purchase order. Documents should be submitted within 5 days of vessel sailing and receipt of OBL from shipping line.

- e) In case BHEL agrees for payment through LC, the same shall be irrevocable, unconfirmed and will be opened 30 days prior to the scheduled delivery and will be valid for a period of 60 days.

11. BANK GUARANTEE.

In case the bank guarantees are required to be deposited towards security deposit / performance guarantee or for any other purpose as per the terms of this tender enquiry, such bank guarantees of the requisite value in the denominated currency of the purchase order should be from one of the Indian branch of BHEL consortium banks and the bank guarantee should be in the proforma as prescribed by BHEL. The proforma of bank guarantee and the list of consortium banks are displayed at BHEL website www.bhelhwr.co.in. However, in case the bank guarantee is not from BHEL consortium banks, then the bidder has to get the bank guarantee confirmed from one of the Indian branch of BHEL consortium banks and the bank charges for such confirmation will be borne by the bidder.

12. GUARANTEE / WARRANTY AND CORRESPONDING REPAIRS / REPLACEMENT OF GOODS.

- a) Goods shall comply with the specifications for material, workmanship and performance. Unless otherwise specified, the warranty shall be for a period of 18 months from the date of receipt. If the delivery is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. The rejected goods shall be taken away by the Seller at his cost and replaced on

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Delivered Duty Paid (DDP) (FOR - BHEL Stores / designated destination basis) within such period. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including Repair / Replenish rejected goods & disposal of rejections, at the risk & cost of the Seller. In case the defects attributable to Seller are detected during processing of the goods at BHEL or at our subcontractor's works, the Seller shall be responsible for free replacement / repair of the goods as required by BHEL.

- b) In case the material is rejected, then date of replacement will be considered as the actual date of delivery.
- c) The bidder shall have to pay 5% incidental charges while taking back supplied material if it is found rejected on receipt. The rejected material shall be sent back only after receipt of replacement / submission of BG/refund of amount paid.

13) QUALITY REQUIREMENT.

Your bid / quotation should have specific confirmation regarding meeting all our quality requirements such as. (i) Test Certificate (TC), (ii) Guarantee Certificate (GC) / Warranty Certificate (WC), (iii) Quality Plan (QP) (if applicable); and (iv) Pre-Dispatch Inspection at your works (if applicable).

14. VALIDITY.

The quotation should be valid for a minimum period of 90 days effective from the date of opening of tender, unless otherwise specified in the tender enquiry.

15. RIGHT OF ACCEPTANCE.

- a) **BHARAT HEAVY ELECTRICALS LIMITED HARIDWAR** reserves the right to reject any or all the bids / quotations without assigning any reason thereof. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced quantity without any extra charges.
- b) Any discount / revised offer / bids submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of offer / bid submission (Part-1). Conditional discounts shall not be considered for evaluation of tenders.
- c) Unsolicited discounts / revised offers / bids given after Part-1 bid opening shall not be accepted. No change in price will be permitted within the validity period asked for in the tender enquiry.
- d) In case of changes in scope and / or technical specification and / or commercial terms & conditions having price implication, techno-commercially acceptable bidders shall be asked by BHEL to submit the impact of such changes on their price bids. In case a bidder opts to submit revised price bid instead of impact called for, then latest price bid shall prevail. However in both situations, original price bid will be necessarily opened.
- e) The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be returned after finalization of contract. EMD shall be forfeited in the event of bidder opting out after tender opening.
- f) BHEL reserves the right to short close the existing Purchase Order / Rate Contract / Work Order or any extension thereof at any stage.

16. TRANSIT INSURANCE.

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- a) Transit Insurance will be covered by BHEL under its open Marine Insurance Policy. Seller shall inform dispatch particulars (Purchase Order, RR / GR / BL / AWB, Invoice value etc.) to Finance department (Store bill Section), BHEL Ranipur Haridwar (Uttarakhand -India) with value of consignment to the Purchaser within 07 days of dispatch for BHEL to arrange insurance coverage in its policy. Failure on the part of seller to inform dispatch particulars will make him liable to pay for any transit damages / losses suffered by the Purchaser.
- b) If Quoted Prices are inclusive of transit insurance, no weightage shall be given while evaluating the bids for Cost of Insurance, being in BHEL Scope.

17. PHYTOSANITARY CERTIFICATE:

- a) As per the Indian Law, all consignments being imported into India by air/sea require a phytosanitary certificate from the country of origin-if articles have been packed with wooden packaging materials. This is mandatory. Please confirm in your offer/dispatch documents that the required phytosanitary certificate will be submitted.
- b) Packaging material means any kind of material of plant origin used for packing which include hay, straw wood shavings, wood chips, saw dust, wood waste, wooden pallets, dunnage mats, wooden packages, coir pith, peat or sphagnum moss etc.

18. RISK PURCHASE.

In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part

thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract.

19. FORCE MAJEURE CLAUSE.

Notwithstanding any other thing contained anywhere else in the contract or PO (Purchase Order), In case the discharge of obligation under the contract by either party is impeded or made unreasonably onerous, neither party shall be considered in breach of the contract to the extent that performance of their respective obligation is prevented by an event of Force Majeure that arises after the effective date (PO date).

In the above clause, Force Majeure means an event beyond the control of the parties to the contract which prevents a party from complying with any obligation of the contract including but not limited to:

- a) Act of God (Such as but not limited to earthquake, drought, tidal waves, floods etc.).
- b) War (whether war be declared or not), Hostilities Invasion, Act of foreign enemy etc.
- c) Rebellion, revolution, insurrection, civil war etc.
- d) Contamination of Radio Activity from any nuclear fuel or from any other nuclear waste or any other hazardous materials.
- e) Riots, commotions, strike unless restricted to the employees of supplier.
- f) Acts of terrorism.

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- g) Other unforeseeable circumstances beyond the control of the parties and which the affected party cannot avoid even by using its best efforts.
- h) Cancellation of contract by customer.
- i) Change in law / government. Regulation making the performance impossible.

The party claiming to be affected by force majeure shall notify the other party in writing immediately without delay on the intervention and on the cessation of such circumstances.

Irrespective of any extension of time, if an event of force majeure occurs and its effect continues for more than 180 days the affected party shall have right to cancel the contract.

As soon as reasonably practicable following the date of commencement of a Force Majeure Event, and within a reasonable time following the date of termination of a Force Majeure Event, either Party invoking it shall submit to the other Party reasonable proof of the nature of the Force Majeure Event and of its effect upon the performance of the Party's obligations under this Agreement.

The party shall, and shall ensure that its Subcontractors shall, at all times take all reasonable steps within their respective powers and consistent with Good Operating Practices (but without incurring unreasonable additional costs) to:

- a) Prevent Force Majeure Events affecting the performance of the party's obligations under this Agreement;
- b) mitigate the effect of any Force Majeure Event; and
- c) Comply with its obligations under this Agreement.

If the war like situation has developed in a country where a seller's works is located in this P.O. or there is political instability and Indian Embassy located in that country forbids or advises for not having any business dealing

with the sellers located in such zone / region/ country then BHEL reserves the right to cancel the order.

20. NON-DISCLOSURE AGREEMENT.

All Drawing and Technical Documents relating to the product or it's manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder, for any infringement of the provisions contained herein.

21. SETTLEMENT OF DISPUTES / ARBITRATION.

Any dispute / difference arising out of or in connection with this contract, including any question regarding its existence, validity or termination, shall be referred to and finally resolved by arbitration under the Arbitration and Conciliation Act, 1996 of India by a Sole Arbitrator to be appointed with mutual consent of the parties. Such Sole Arbitrator shall be either a retired judge of Supreme Court or High Court or District Court of India or some Advocate having practiced in Indian Courts. The seat or place of arbitration shall be New Delhi, India. The language to be used in the arbitration shall be English. The governing law of the contract shall be the substantive law of India. In case the parties fail

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to agree on the appointment of arbitrator within 2 months of the notice invoking arbitration by one party, then the arbitrator shall be appointed in accordance with the Arbitration and Conciliation Act, 1996 of India.

JURIDICTION: The courts of New Delhi, India, shall have exclusive jurisdiction.

22. INFORMATION TO THE BIDDERS.

- a) Purchase related information is available at our Business-to-Business (B2B) Portal available on our website www.bhelhwr.co.in. The user ID & password can be obtained by sending a request to concerned purchase executives.
- b) Intimate your change in mail address or communication address or changes, if any, by email to ppx_idx@bhelnhr.co.in giving your bidder Code.
- c) Please resolve your rejections and unexecuted overdue purchase order immediately which are posted at our B2B Portal, which can be visited through our site www.bhelhwr.co.in.
- d) Copy of this Tender Enquiry is being sent through the post/ Courier / E-mail or by any existing means.
- e) Invoice description and Unit of measurement should be strictly in accordance with Purchase order.
- f) Unit of measurement for dimension and weight should be in metric system only.

23. NOTE.

- a) Special conditions of enquiry, if enclosed By BHEL, will supersede the respective standard / general terms of enquiry.

- b) Any other Standard terms and Conditions of the bidder attached / referred against the tender enquiry will be treated as null and void ab initio.
- c) In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulged in malpractices, cheating, bribery, fraud or any other misconducts or formation of cartel so as to influence the bidding process or influence the price etc. Guidelines for Suspension of Business Dealings with Suppliers / Contractors shall prevail over which is available at BHEL website <http://www.bhel.com>
- d) 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.

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1. GENERAL.

These general terms & conditions shall apply to all the Tender Enquiries, notice inviting tenders, request for quotations concerning the supply of goods and / or rendering of services to Bharat Heavy Electricals Ltd., HEEP, Haridwar (hereinafter referred to as BHEL or the Purchaser).

2. ORIGIN OF QUOTATION.

- a) The quotation should preferably be from the principal bidder. However tender specific authorized registered dealer / agent can also submit the bid on their behalf, failing which the quotation is liable to be ignored. BHEL prefers to deal directly with the principal manufacturers.

- b) An agent cannot quote on behalf of more than one principal in the same Tender Enquiry.

3. SUBMISSION OF TENDER.

- a) Bid / Quotation must be enclosed in sealed cover on which tender enquiry number and the due date MUST BE written and be invariably sent under REGISTERED POST / SPEED POST / COURIER / Dropped in the Tender Box: addressed as follows:-

Quotation Against Enquiry No. _____

Dated: _____

Due on: _____

To,

**THE HEAD OF MATERIALS MANAGEMENT,
Heavy Electrical Equipment Plant,
Bharat Heavy Electricals Limited,
HARIDWAR-249403 (Uttarakhand), INDIA.**

- b) In case of Three / Two Part Bid, technical bid containing technical offer, duly signed and un-priced copy of the Price Bid should be kept in one envelope. Price Bid containing only the price should be kept in a separate envelope. All envelopes indicating Part-1 or Part-2 or Part-3 as the case may be to be put in a bigger envelope. Please note that un-priced bid should be the exact replica of price bid but without prices.
- c) The bid / quotation must be posted before due date, keeping allowance for postal transit time. Alternatively, the tenders duly sealed and super-scribed as above may be deposited in the Tender Box. Quotations sent by any mode but not received in time will be ignored. Tender received through authorized E-mail is also acceptable. However, in time submission of tender in tender box shall be the responsibility of the bidder, sent through any mode. Documents submitted with the offer / bid shall be signed and stamped in each page by authorized representative of the bidder.
- d) Any additional documents submitted by supplier / bidder, during processing of registration application / tender or after placement of order shall not be accepted unless it is

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submitted with forwarding letter and duly signed and stamped as mentioned above in clause c.

- e) The bids of the bidders who are on the banned list and also the bids of the bidders, who engage the services of the banned firms, shall be rejected. The cutting / overwriting in the bid / offer must be duly attested by the signatories to the bid. The list of firms banned by BHEL is available on BHEL web site www.bhel.com.
- f) Being PMD vendor, if you are not quoting against this tender enquiry, please send your regret letter positively for our reference with valid reasons for not participating in the tender enquiry. Repeated lack of response on the part of bidder may lead to deletion such PMD vendor from BHEL's approved vendor list.
- g) The bidders will submit Integrity Pact, duly signed by its authorized signatory, along with their bids wherever estimated tender value is Rs. 5 Crore or more.
- h) In case of open tender, the unregistered bidder shall submit inter alia duly filled-in Supplier Registration Form (SRF) along with the bid. Bidders can download the SRF from www.bhel.com
- i) BHEL reserves the right to award tendered quantities among more than one bidder (after acceptance of L1 price by the other bidders). BHEL can also consider awarding of part of the tendered quantity to other than L-1 bidder at L1 counter offered rates, if the quantity offered by the L-1 bidder is less than the quantity tendered for.

4. TENDER OPENING.

Tender opening is scheduled to start in the Tender Room at 2:00 PM, on the due date. Therefore bid / quotations must reach this office / tender Box latest by 1:45 PM on due date. Only participating bidders are allowed to attend tender opening. **TENDERS RECEIVED AFTER THE SPECIFIED TIME OF THEIR 'SUBMISSION' WILL BE TREATED AS LATE TENDERS AND SHALL NOT BE CONSIDERED UNDER ANY CIRCUMSTANCES.** The bidders or their authorized representatives may be allowed to attend tender opening if duly authorized by their principals, through a tender

specific letter, for price bid opening on that particular day. General authorization letter is not acceptable.

5. SPECIFICATION, DRAWINGS & STANDARD.

- a) Bidders must give their detailed specification in the quotation along with relevant technical literature / catalogue etc. against the tender enquiry.
- b) The Bid should be accompanied with relevant copies of catalogues, drawings or specification as per tender enquiry. If these documents are not furnished, the offer is liable to be rejected.
- c) Wherever national / international (N/IN) standards are referred, the latest N/IN standards are to be followed. Mention year & date of standard revision that shall be followed for the supply.
- d) All Drawings and Standards are proprietary of BHEL. It must not be used in anyway detrimental to the interest of the company.

6. PRICE SCHEDULE.

- a) Kindly quote your prices in figures and words both. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 status.
- b) Prices quoted should not be more than the prices quoted to any other BHEL units / offices / divisions. Vendor to submit copy of latest Purchase Order placed by any unit of BHEL for similar items in the technical bid. In case no order has been placed on such items, specific confirmation that no order has been placed on such items should be provided.
- c) Prices should be quoted on F.O.R. Destination basis. Transit insurance shall be arranged by BHEL and not to be included in the prices. The offers quoted on other than F.O.R destination basis may result in non consideration of such bids.

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- d) In case BHEL accepts the EX-Works prices, such offers will be loaded by 1.5% of EX-Works value towards freight or with actual freight charges as per BHEL freight rate contract whichever is higher.
- e) In case of Indigenous items covered by DGS & D Rate Contract, the bidders should submit latest valid copy of the rate contract along with bid / quotation
- f) Applicable **IGST / CGST / SGST** and any other statutory levy should be indicated separately and clearly in the bid / quotation.
- g) Bidders can dispatch goods through any Indian Bank Association approved transporters having their branch at HARIDWAR / destination. If material is dispatched through other than Indian Bank Association approved transporter, material to be delivered on door delivery BHEL Stores basis.
- h) In case of dispatch of material through any other unapproved transporter, payment shall be made only after receipt of material and any additional charges payable to the transporter shall be to the bidder's account.
- i) No demurrage / godown rent will be payable to the vendor / vendor's transporter for any delay in payments attributable to the vendor.

NB: Financial evaluation of L1, L2 Status will be on the basis of Landed Cost to BHEL.

7. REVERSE AUCTION.

- a) BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after Techno-Commercial Evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides for RA. Detailed guidelines available at our site www.bhel.com
- b) In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to

participate in Reverse Auction will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-Submission of 'online sealed bid' by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

8. DELIVERY TERMS.

- a) Goods shall be delivered on 'FOR Destination' basis to the named destination unless otherwise called for in the tender enquiry.
- b) Loading on account of 3rd party inspection charges in case of Indian bidders shall be 0.20%.

9. PENALTY FOR LATE DELIVERY.

- a) Date of delivery will be considered as per the delivery terms mentioned in the Purchase Order. Penalty will be applicable on total order value @0.5% per week or part thereof subject to maximum of 10% of the PO value unless otherwise specified in Special Conditions of tender enquiry. Acceptance / Non Acceptance of this condition must be specifically mentioned in your quotation. Any deviation from this will be loaded accordingly i.e. BHEL shall load maximum penalty under penalty for late delivery Clause, to the extent the same is not agreed by the bidder, for the purpose of evaluation.
- b) Bidders are requested to quote the best delivery meeting the delivery requirements. BHEL reserves the right to reject the offers not meeting BHEL's delivery requirement.
- c) Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.
- d) Bidder shall deliver the goods in the manner and schedule agreed under the terms and conditions of Purchase order.
- e) **DELIVERY IN CASE OF REJECTION:** In case the material is rejected, then date of replacement will be considered as the actual date of delivery.
- f) **DELIVERY AGAINST BANK DOCUMENTS:** In case payment terms quoted by bidder are documents through bank, and

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the delivery terms being "FOR Haridwar / FOR Transporter Go-down" then date of delivery will be date of intimation by transporter / bidder of delivery of material at Haridwar for the penalty purpose.

- g) Where the payments are through bank, the documents may be presented for negotiation to BHEL authorized / nominated bank.

10. PAYMENT TERMS.

- a) BHEL's standard payment term is Payment after receipt and acceptance of materials / items at HEEP, BHEL-Store or at desired destination unless otherwise specified in Special Terms attached to the tender enquiry.
- b) BHEL reserves the right to accept or reject the offer of the bidder who quotes the payment term other than BHEL's standard payment term.
- c) Loading on account of deviation in payment terms shall be done as per extant rules of BHEL-Haridwar.

11. TAXES & DUTIES.

- a) The bidder to specify in their offer (part 1 bid) the category of their registration under GST like Registered, Unregistered and composite dealer.
- b) The provisional GST registration number of Bharat Heavy Electrical Ltd, Heavy Electricals Equipment Plant, Ranipur, Haridwar is "05AAACB4146P1ZL" with state Code as "05" and State Name as "Uttarakhand".
- c) Please quote our provisional GST registration number in all invoices raised for supply of goods and services under GST regime and also ensure filing of timely return and payment of tax and compliance of other applicable provisions on supplier under GST regime.
- d) No GST will be reimbursed to unregistered or composite dealer. In the event, any GST is quoted by composite dealer, the same shall be added to the cost of supply in evaluating the bid.

- e) Since, input credit of GST will be available to BHEL-Haridwar only after correct filing of return and payment of applicable GST by supplier, reimbursement of GST shall be made by BHEL-Haridwar on matching of vendor inputs at GST portal, ensuring availability of input credit to BHEL Haridwar. Payment of GST will be made to vendor after matching of input credit and vendor to ensure submission of their invoices along with consent to accept payment of tax after such matching in all cases where bills are submitted directly to BHEL-Haridwar or through bank or under LC or through any other mode.
- f) In the event of any disallowance of input credit or applicability of interest or any other financial liability arises on BHEL-Haridwar due to any default of supplier under GST, such implication shall be to supplier's account.
- g) In the event of any change in the status of the vendor after the submission of the bid but before the supply, GST applicable at the time of supply or in the bid, based on the registration status of the vendor, whichever is lower shall be payable.
- h) Where ever applicable If PAN (Permanent Account Number) of the recipient is not available, income tax is deductible either at the normal rate or at the rate of 20 percent, whichever is higher as per Section 206AA of Indian Income Tax Act 1961.
- i) The bidder shall clearly indicate HSN (*Harmonised System Nomenclature*) / SAC (*Service Accounting Code*), its description and applicable rate of GST for each item in his techno-commercial bid.
- j) Statutory Variation in Taxes & duties as applicable at the time of supply shall be payable. However, in the event of no change in law but bidder quoting certain tax structure in bid document which is lower than the applicable one, such amount shall be the maximum amount of tax that can be claimed by bidder.
- k) IMPORTED GOODS OFFERED BY INDIAN BIDDERS AGAINST DEALER INVOICE: Wherever the material being offered is imported, the bidder must quote the prices inclusive of IGST. The rate and value of IGST as included in

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the price must be indicated separately. In case quantum of IGST is not mentioned by the bidder the same will not be considered for evaluation. However, bidder will have to pass on the benefit of IGST to BHEL at the time supply.

- l) In case of directly dispatchable items to Customer's Site, BHEL-Haridwar will inform the GST registration number of the respective customer which must be mentioned on the vendor's invoice. Vendor to ensure availability of such information from BHEL-Haridwar before dispatch of any material. However while filing GSTN-1, BHEL Haridwar GSTN number to be quoted.

Note: - Vendors must ensure compliance of all the applicable rules and procedure as envisaged in the GST Regime. Any loss to BHEL-Haridwar due to fault / non-compliance by the vendor will be to the vendor's account.

12. BANK GUARANTEE.

In case the bank guarantees are required to be deposited towards security deposit/performance guarantee or for any other purpose as per the terms of this tender enquiry, such bank guarantees of the requisite value in the denominated currency of the purchase order should be from one of the Indian branch of BHEL consortium banks and the bank guarantee should be in the proforma as prescribed by BHEL. The proforma of bank guarantee and the list of consortium banks are displayed at BHEL website www.bhelhwr.co.in. However, in case the bank guarantee is not from BHEL consortium banks, then the bidder has to get the bank guarantee confirmed from one of the Indian branch of BHEL consortium banks and the bank charges for such confirmation will be borne by the bidder.

13. GUARANTEE / WARRANTY AND CORRESPONDING REPAIRS / REPLACEMENT OF GOODS.

Goods shall comply with the specifications for material, workmanship and performance. Unless otherwise specified, the warranty shall be for a period of 18 months from the date of receipt. If the delivery is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. The rejected goods shall be taken

away by the Seller at his cost and replaced on Delivered Duty Paid (DDP) (FOR - BHEL Stores / designated destination basis) within such period. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including Repair / Replenish rejected goods & disposal of rejections, at the risk & cost of the Seller. In case the defects attributable to Seller are detected during processing of the goods at BHEL or at our subcontractor's works, the Seller shall be responsible for free replacement / repair of the goods as required by BHEL.

- b) **RETURN OF REJECTED MATERIAL FOR REPLACEMENT:** The bidder shall have to pay 5% incidental charges while taking back supplied material if it is found rejected on receipt. The rejected material shall be sent back only after receipt of replacement / submission of BG/refund of amount paid.

14. QUALITY REQUIREMENT.

Your bid/quotation should have specific confirmation regarding meeting all our quality requirements such as. (i) Test Certificate (TC), (ii) Guarantee Certificate (GC) / Warranty Certificate (WC), (iii) Quality Plan (QP) (if applicable); and (iv) Pre-Dispatch Inspection at your works (if applicable).

15. VALIDITY

The quotation should be valid for a minimum period of 90 days effective from the date of opening of tender, unless otherwise specified in the tender enquiry.

16. RIGHT OF ACCEPTANCE.

- a) **BHARAT HEAVY ELECTRICALS LIMITED HARIDWAR** reserves the right to reject any or all the bids / quotations without assigning any reason thereof. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced quantity without any extra charges.
- b) Any discount / revised offer / bids submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of offer / bid submission (Part-1). Conditional discounts shall not be considered for evaluation of tenders.

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- c) Unsolicited discounts / revised offers / bids given after Part-1 bid opening shall not be accepted. No change in price will be permitted within the validity period asked for in the tender enquiry.
- d) In case of changes in scope and / or technical specification and / or commercial terms & conditions having price implication, techno-commercially acceptable bidders shall be asked by BHEL to submit the impact of such changes on their price bids. In case a bidder opts to submit revised price bid instead of impact called for then the latest price bid shall prevail. However in both situations, original price bid will be necessarily opened.
- e) The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be returned after finalization of contract. EMD shall be forfeited in the event of bidder opting out after tender opening.
- f) BHEL reserves the right to short close the existing Purchase Order / Rate Contract / Work Order or any extension thereof at any stage.

17. TRANSIT INSURANCE.

- a) Transit Insurance will be covered by BHEL under its open Insurance Policy. Seller shall inform dispatch particulars (Purchase Order, RR/GR/, Invoice value etc.) to "Finance department (Store bill Section), BHEL Ranipur Haridwar (Uttarakhand -India) with value of consignment to the Purchaser within 07 days of dispatch for BHEL to arrange insurance coverage in its policy. Failure on the part of seller to inform dispatch particulars will make him liable to pay for any transit damages / losses suffered by the Purchaser.
- b) If Quoted Prices are inclusive of transit insurance, no weightage shall be given while evaluating the bids for Cost of Insurance, being in BHEL Scope.

18. RISK PURCHASE.

In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfillment of any other terms and

conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract.

19. FORCE MAJEURE CLAUSE.

Notwithstanding any other thing contained anywhere else in the contract or PO (Purchase Order), In case the discharge of obligation under the contract by either party is impeded or made unreasonably onerous, neither party shall be considered in breach of the contract to the extent that performance of their respective obligation is prevented by an event of Force Majeure that arises after the effective date (PO date).

In the above clause, Force Majeure means an event beyond the control of the parties to the contract which prevents a party from complying with any obligation of the contract including but not limited to:

- a) Act of God (Such as but not limited to earthquake, drought, tidal waves, floods etc.).
- b) War (whether war be declared or not), Hostilities Invasion, Act of foreign enemy etc.
- c) Rebellion, revolution, insurrection, civil war etc.
- d) Contamination of Radio Activity from any nuclear fuel or from any other nuclear waste or any other hazardous materials.
- e) Riots, commotions, strike unless restricted to the employees of supplier.
- f) Acts of terrorism.
- g) Other unforeseeable circumstances beyond the control of the parties and which the affected party cannot avoid even by using its best efforts.
- h) Cancellation of contract by customer.
- i) Change in law/ government. Regulation making the performance impossible.

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The party claiming to be affected by force majeure shall notify the other party in writing immediately without delay on the intervention and on the cessation of such circumstances.

Irrespective of any extension of time, if an event of force majeure occurs and its effect continues for more than 180 days the affected party shall have right to cancel the contract.

As soon as reasonably practicable following the date of commencement of a Force Majeure Event, and within a reasonable time following the date of termination of a Force Majeure Event, either Party invoking it shall submit to the other Party reasonable proof of the nature of the Force Majeure Event and of its effect upon the performance of the Party's obligations under this Agreement.

The party shall, and shall ensure that its Subcontractors shall, at all times take all reasonable steps within their respective powers and consistent with Good Operating Practices (but without incurring unreasonable additional costs) to:

- a) Prevent Force Majeure Events affecting the performance of the party's obligations under this Agreement.
- b) mitigate the effect of any Force Majeure Event and
- c) Comply with its obligations under this Agreement.

If the war like situation has developed in a country where a seller's works is located in this P.O. or there is political instability and Indian Embassy located in that country forbids or advises for not having any business dealing with the sellers located in such zone / region/ country then BHEL reserves the right to cancel the order.

20. NON-DISCLOSURE AGREEMENT.

All Drawing and Technical Documents relating to the product or it's manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the

bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder, for any infringement of the provisions contained herein.

21. SETTLEMENT OF DISPUTES / ARBITRATION.

In all cases of dispute the matter shall be referred for ARBITRATION by sole arbitrator to be appointed by the Unit Head of Bharat Heavy Electricals Ltd., at HARIDWAR. The award of the Arbitrator shall be final and binding on both the parties. The place of Arbitration shall be Haridwar.

JURISDICTION: The courts of Haridwar, India, shall have exclusive jurisdiction.

22. WHARFAGE / DEMURRAGE RESPONSIBILITY.

In the event of delay in receipt of documents by Manager (Stores-Shipping) BHEL-Haridwar and in case where dispatches are made through Unapproved Transporter the sole responsibility for wharfage /demurrage for such delay shall be that of supplier.

23. CONDITIONS FOR AVAILING MICRO & SMALL ENTERPRISES (MSE'S) BENEFITS.

- a) "MSE Suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (**five years** from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at annexure-1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is found or the requisite documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be

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uploaded on the portal. Documents should be notarized or attested by a Gazetted officer."

- b) Any new supplier will be eligible for registration with BHEL as MSE supplier provided at least any one of the following documents are submitted along with application for registration :-

- 1) Valid NSIC Certificate or
- 2) Udyog Aadhaar Memorandum or
- 3) Entrepreneurs Memorandum part II (EM II) certificate (valid based on deemed validity of 5 years) or
- 4) EM II certificate along with attested copy of CA Certificate (as per prescribed format at annexure-A) applicable for the relevant financial year (latest audited), where the deemed validity of EM II is over.
- 5) Any Start-Up Organization will be eligible to avail all the benefits as provided by Govt. guidelines after submitting the required documents.

However, credentials of all MSE suppliers will be verified before advancing the intended benefits.

- c) MSE bidders claiming SC/ST status will have to submit SC/ST certificate of the Proprietor from competent authority. Attested (notarized or attested by Gazetted officer) copy to be submitted along with the offer.
- d) In case techno-commercial accepted bidders include MSE source and their prices (based on landed cost – considering quoted prices) are within the price band of 15% w.r.t. L-1 bidder, then BHEL can offer 20% of quantity of respective item (rounded off to nearest number) to MSE bidders at L-1 price and in case, more than one MSE bidder is in 15 % band and the same is accepted by more than one MSE bidders then 20% quantities of respective items will be considered for ordering on proportionate basis amongst MSE bidders.
- e) While distributing the 20% quantity amongst MSE bidders the decimal points in quantity shall be ignored for all the

bidders except the L-1 amongst MSE bidders. Balance quantity after allocating the quantity to other MSE bidders ignoring the quantities in decimal, shall be given to L-1 (amongst MSE) bidder. However if there are more than one MSE bidder at the same price level than preference for additional quantities due to ignoring off the decimal (as mentioned above) shall be given to the bidder offering favorable terms to BHEL and if the conditions offered are also same then preference will be given to the bidder having high SPR rating.

- f) In case there are more than one MSE bidders (with different landed cost to BHEL) within 15% price band of lowest bidder and quantity to be offered is 1 no. only, then preference shall be given to the MSE bidder with lowest landed cost .
- k) In case there are more than one MSE bidders (with same landed cost to BHEL) within 15% price band of lowest bidder and quantity to be offered is 1 no. only, then preference shall be given first, based on the favorable terms in the bid and in case terms are also same, the bidder with high SPR rating shall be given preference.
- l) If L1 bidder is MSE bidder, entire quantity will be given to such MSE bidder only.
- m) Note: It may however be noted that MSE guidelines as on date (Date of Technical Bid Opening Part-1) shall prevail

24. INFORMATION TO THE BIDDERS.

- a) Purchase related information is available at our Business-to-Business (B2B) Portal available on our website www.bhelhwr.co.in The user ID & password can be obtained by sending a request to concerned purchase executives.
- b) Intimate your change in mail address or communication address or changes, if any, by email to ppx_idx@bhelhwr.co.in giving your bidder Code.
- c) Please resolve your rejections and unexecuted overdue purchase order immediately which are posted at our B2B Portal, which can be visited through our site www.bhelhwr.co.in

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- d) Copy of this Tender Enquiry is being sent through the post.

25. NOTE.

- a) Special conditions of enquiry, if enclosed by BHEL, will supersede the respective standard/general terms of enquiry.
- b) Any other Standard terms and Conditions of the bidder attached/referred against the tender enquiry will be treated as null and void ab initio.
- c) In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulged in malpractices, cheating, bribery, fraud or any other misconducts or formation of cartel so as to influence the bidding process or influence the price etc. Guide- lines for Suspension of Business Dealings with Suppliers / Contractors shall prevail over which is available at BHEL website <http://www.bhel.com>
- d) 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.