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NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited



Ref:

Date: --/--/----

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NOTICE INVITING TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES

OR

PURCHASE TENDERS FROM THIS OFFICE ALSO

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To

Dear Sir/Madam

Sub : NOTICE INVITING TENDER

Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	TENDER NUMBER	<i>BHEL/NR/SCT/ANPARA D/CHEM-CLEAN/925</i>	
ii	Broad Scope of job	Pre-Boiler Flushing & Chemical cleaning (EDTA) of BoilerS of Unit No.6 &7 at 2X500 MW Anpara d TPS	
iii	DETAILS OF TENDER DOCUMENT		
a	Volume-IA	<i>Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc</i>	<i>Applicable</i>
b	Volume-IB	<i>Special Conditions of Contract (SCC)</i>	<i>Applicable</i>
c	Volume-IC	<i>General Conditions of Contract (GCC)</i>	<i>Applicable</i>
d	Volume-ID	<i>Forms and Procedures</i>	
e	Volume-II	<i>Price Schedule (Absolute value).</i>	<i>Applicable</i>
iv	Issue of Tender Documents	1. <u>Sale from BHEL PS Regional office at :</u> <i>Start : 13.07.2013 , Time :09.00 hrs</i> <i>Closes: 01.08.2013 , Time : 12.00 hrs</i> 2. From BHEL website (www.bhel.com) Tender documents will be available for downloading from website till due date of submission	<i>Applicable/</i> <i>Not applicable</i>
v	DUE DATE & TIME OF OFFER SUBMISSION	<i>Date 02.08.2013 , Time : 15.00 hrs</i> <i>Place : BHEL-PSNR, NOIDA</i>	<i>Applicable</i>
vi	OPENING OF TENDER	<i>Date : 02.08.2013 , Time : 15.30 hrs</i> <i>(within 2 hours of the latest due date and time of offer submission).</i>	<i>Applicable</i>

		Notes: (1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day. (2) Bidder may depute representative to witness the opening of tender	
vii	EMD AMOUNT	Rs.1,50,000/-	Applicable
viii	COST OF TENDER	Rs 2000/-.	Applicable/Not Applicable
ix	LAST DATE FOR SEEKING CLARIFICATION	Date: 01.08.2013 Along with soft version also, addressing to undersigned & to others as per contact address given below	Applicable
x	SCHEDULE OF Pre Bid Discussion (PBD)	Date :	Applicable/Not applicable.
xi	INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)		Applicable/Not Applicable
xii	Latest updates	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums) <u>and not in the newspapers</u> . Bidders to keep themselves updated with all such information	

- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.
- 3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Noida issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Noida, Sundays and second/ last Saturdays
- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Noida. For other details and for 'One Time EMD' please refer General Conditions of Contract.
- 5.0 **Procedure for Submission of Tenders:** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:
- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
 - PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
 - One set of tender documents shall be retained by the bidder for their reference

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below.
(All pages to be signed and stamped)

Sl no	Description	Remarks
Part-I A		
	<p>ENVELOPE – I superscribed as : PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:</p> <p>CONTAINING THE FOLLOWING:-</p>	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	<p>Duly filled-in 'No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above.</p> <p>Note:</p> <p>a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained.</p> <p>b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding.</p> <p>i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL</p> <p>ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender</p>	
iii.	<p>Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria.</p> <p>It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.</p>	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : <u>Technical</u> Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

PART-I B		
	<p>ENVELOPE – II superscribed as: PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK :</p>	

	PROJECT: DUE DATE OF SUBMISSION: CONTAINING THE FOLLOWING:-	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender <u>OR</u> Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender 2. Cost of Tender (Demand Draft or copy of Cash Receipt as the case may be)	

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE-III superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: CONTAINING THE FOLLOWING	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	
ii	Volume II – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	OUTER COVER	
	ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION: CONTAINING THE FOLLOWING:	
i	<ul style="list-style-type: none"> ○ Envelopes I ○ Envelopes II ○ Envelopes III 	

SPECIAL NOTE : All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 Assessment of Capacity of Bidders:

Bidders capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise as per the following:

- I. **LOAD:** Load takes into consideration ALL the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

- i). Total number of Packages
 Total number of Packages in hand = P
 Where

- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

- II. **PERFORMANCE:** Here 'Monthly Performance' of the bidder for all the packages (under execution/ executed during the 'Period of Assessment' in all the Power Sector Regions of BHEL) SIMILAR to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, for all the unit wise identified packages (refer Table I)

- i). Calculation of Overall 'Performance Rating' for 'similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':
 This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

- a) $P_1, P_2, P_3, P_4, P_5, \dots, P_N$ etc be the packages (under execution/ executed during the 'Period of Assessment' in all Regions) SIMILAR to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = P_T (ie $P_T = P_1 + P_2 + P_3 + P_4 + \dots + P_N$)
- b) Number of Months ' T_1 ' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package P_1 . Similarly T_2 for package P_2 , T_3 for package P_3 , etc for the tendered scope. Now calculate cumulative total months ' T_T ' for total similar Packages ' P_T ' for all Regions (ie $T_T = T_1 + T_2 + T_3 + T_4 + \dots + T_N$)
- c) Sum ' S_1 ' of 'Monthly Performance Evaluation' Scores ($S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, S_{1-5}, \dots, S_{1-N}$) for similar package P_1 , for the 'period of assessment' ' T_1 ' (ie $S_1 = S_{1-1} + S_{1-2} + S_{1-3} + S_{1-4} + S_{1-5} + \dots + S_{1-N}$). Similarly S_2 for package P_2 for period T_2 , S_3 for package P_3 for period T_3 , etc for the tendered scope for all Regions. Now calculate cumulative sum ' S_T ' of 'Monthly Performance Evaluation' Scores for total similar Packages ' P_T ' for all Regions (ie ' $S_T = S_1 + S_2 + S_3 + S_4 + S_5 + \dots + S_N$ ')
- d) Overall Performance Rating ' R_{BHEL} ' for the similar Package/Packages (under execution/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL):

Aggregate of Performance scores for all similar packages in all the Regions
 = -----

Aggregate of months for each of the similar package for which performance should have been evaluated in all the Regions

$$= \frac{S_T}{T_T}$$

e) Bidders to note that the risk of non evaluation or non availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder

f) Table showing methodology for calculating 'a', 'b' and 'c' above

Sl no	Item Description	Details for all Regions							Total
		(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	P ₁	P ₂	P ₃	P ₄	P ₅	...	P _N	Total No of similar packages for all Regions = P _T ie Sum (Σ) of columns (iii) to (ix)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment for corresponding similar Package (as in row 1)	T ₁	T ₂	T ₃	T ₄	T ₅	...	T _N	Sum (Σ) of columns (iii) to (ix) = T _T
3	Monthly performance scores for the corresponding period (as in Row 2)	S _{1-1,} S _{1-2,} S _{1-3,} S _{1-4,} ... S _{1-T1}	S _{2-1,} S _{2-2,} S _{2-3,} S _{2-4,} ... S _{2-T2}	S _{3-1,} S _{3-2,} S _{3-3,} S _{3-4,} ... S _{3-T3}	S _{4-1,} S _{4-2,} S _{4-3,} S _{4-4,} ... S _{4-T4}	S _{5-1,} S _{5-2,} S _{5-3,} S _{5-4,} ... S _{5-T5}	S _{N-1,} S _{N-2,} S _{N-3,} S _{N-4,} ... S _{N-TN}	-----
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S ₁	S ₂	S ₃	S ₄	S ₅	...	S _N	Sum (Σ) of columns (iii) to (ix) = S _T

ii) Calculation of Overall 'Performance Rating' (R_{BHEL}) in case 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. 'R_{BHEL}' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

- a) 'Period of Assessment.
- b) 12 months preceding the cut-off month
- c) 24 months preceding the cut-off month
- d) 36 months preceding the cut-off month

In case, R_{BHEL} cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'

iii) Factor “L” assigned based on Overall Performance Rating (R_{BHEL}) at Power Sector Regions.:

Sl no	Overall Performance Rating (R _{BHEL})	Corresponding value of ‘L’
1	=60	NA
2	> 60 and ≤ 65	0.4
3	> 65 and ≤ 70	0.35
4	> 70 and ≤ 75	0.25
5	> 75 and < 80	0.2
6	≥ 80	NA

III. ‘Assessment of Capacity of Bidder’:

‘Assessment of Capacity of Bidder’ is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages $P_{Max} = (R_{BHEL} - 60)$ divided by corresponding value of ‘L’
i.e. $(R_{BHEL} - 60)/L$

Note:

- In case the value of P_{Max} results in a fraction, the value of P_{Max} is to be rounded off to next whole number
- For $R_{BHEL} = 60$, $P_{Max} = '1'$
- For $R_{BHEL} \geq 80$, there will be no upper limit on P_{Max}

The Bidder shall be considered ‘Qualified’ as per ‘Assessment of Capacity of Bidder’ for the subject Tender if $P \leq P_{Max}$
(where P is calculated as per clause 9.1)

IV. Explanatory note:

- Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, etc at the individual level irrespective of rating of Plant, and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, CI, Civil, Structure, etc is considered individual level of package. For example in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e the ‘identified packages as per Table-1 below), the ‘PERFORMANCE’ part against sl no II above, needs to be evaluated considering all the identified packages (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder’s capacity to execute the tendered scope is assessed in line with III above
- Identified Packages (Unit wise)

Table-1

	Civil	Electrical & CI	Mechanical
	i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

- c) Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 shall be considered "NEW VENDOR".

A 'NEW VENDOR' shall be considered qualified subject to satisfying all other tender conditions

A 'NEW VENDOR' if awarded a job (of package/packages identified under this clause) shall be tagged as "FIRST TIMER" on the date of first LOI from BHEL.

The "FIRST TIMER" tag shall remain till execution of work for a period of not less than 09 months, from the commencement of work of first package

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as "FIRST TIMER" excepting for the Tenders which have been opened on or before the date of the bidder being tagged as 'FIRST TIMER'.

After removal of 'FIRST TIMER' tag, the Bidder shall be considered 'QUALIFIED' for the future tenders subject to satisfying all other tender conditions including 'Capacity Evaluation of Bidders'.

- d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the Overall Performance Rating 'R_{BHEL}' only, starting from the upper band.
- e) 'Under execution' shall mean works in progress as per the following:
- i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries
 - ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)
 - iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.
- Note : BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (i), (ii) and (iii) above, depending upon the balance scope of work to be completed.
- f) Performance evaluation in CL 9 above is applicable to Prime bidder and consortium partner (or Technical tie up partner) for their respective scope of work.

10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

- 12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.
- 13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.
- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.
- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), if applicable, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.
- 16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.
- 17.0 In case BHEL decides on a 'Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.
- 18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.
- 19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .
- However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDS' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.
- 20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.
- 21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.
- 22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.
- 23.0 Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:
- 23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement with a validity period of six months initially. In case the consortium is awarded the contract, then the Consortium Agreement between the Prime Bidder and Consortium Partner or partners shall be extended till contractual completion period including extension periods if any applicable.

- 23.2 'Stand alone' bidder cannot become a 'Prime Bidder' or a 'Consortium bidder' or 'Technical Tie up bidder' in a consortium (or Technical Tie up) bidding. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non compliance, consortium bids of such Prime bidders will be rejected.
- 23.3 Number of partners for a consortium Bidding (or Technical Tie up) shall be as specified in the PQR
- 23.4 Prime Bidder shall be as specified in the Pre Qualification Requirement, else the bidder who has the major share of work
- 23.5 In order to be qualified for the tender, Prime Bidder and Consortium partner or partners shall satisfy (i) the Technical 'Pre Qualifying Requirements' specified for the respective package, (ii) "Assessment of Capacity of Bidder" as specified in clause 9.0
- 23.6 Prime Bidder shall comply with additional 'Technical' criteria of PQR as defined in 'Explanatory Notes for the PQR'
- 23.7 Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified
- 23.8 In case customer approval is required, then Prime Bidder and Consortium Partner or partners shall have to be individually approved by Customer for being considered for the tender.
- 23.9 Prime Bidder shall be responsible for the overall execution of the contract
- 23.10 In case of award of job, Performance shall be evaluated for Prime Bidder and Consortium Partner or partners for their respective scope of work(s) as per prescribed formats
- 23.11 In case the Consortium partner or partners back out, their SDs shall be encashed by BHEL. In such a case, other consortium partner or partners meeting the PQR have to be engaged by the Prime Bidder, and if not, the respective work will be withdrawn and executed on risk and cost basis of the Prime Bidder. The new consortium partner or partners shall submit fresh SDs as applicable.
- 23.12 In case the prime Bidder withdraws, the whole contract shall be considered cancelled and short closed.
- 23.13 After execution of work, the work experience shall be assigned to the Prime Bidder and the consortium partner or partners for their respective scope of work. After successful execution of two similar works with the same consortium partner or partners under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'stand alone' bidder for similar works, subject to certification from BHEL about the active involvement of the Prime Bidder for satisfactory execution of the works.
- 23.14 The consortium partner shall submit SD equivalent to 2% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value. In case there are two consortium partners, then each partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value.
- 23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also
- 24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.
- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.

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

27.0 Order of Precedence

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

- a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
- b. Notice Inviting Tender (NIT)
- c. Price Bid
- d. Technical Conditions of Contract (TCC)—Volume-1A
- e. Special Conditions of Contract (SCC) —Volume-1B
- f. General Conditions of Contract (GCC) —Volume-1C
- g. Forms and Procedures —Volume-1D

for BHARAT HEAVY ELECTRICALS LTD

(SCT)

Enclosure

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List .
- 03 Other Tender documents as per this NIT.

ANNEXURE - 1**PRE QUALIFYING REQUIREMENTS**

JOB	Pre-Boiler Flushing & Chemical cleaning (EDTA) of BoilerS of Unit No.6 &7 at 2X500 MW Anpara d TPS
TENDER NO	BHEL/NR/SCT/ANPARA D/CHEM-CLEAN/925

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no of supporting document. Bidder must fill up this column as per applicability
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium/Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	NOT APPLICABLE	
B	Technical Bidders who wish to participate should have executed during the last seven years, as on date of opening of technical bid , works of similar nature covered in this tender, in power plant of rating at least 190 MW or higher. (Relevant documents in support of above shall be submitted by bidder)		
C	Financial TURNOVER Bidders should have achieved an average annual financial turnover (Audited) of Rs 24 Lakhs or more over last three Financial Years (FY) i.e (2009-10, 2010-11, 2011-12). Bidder shall submit audited annual accounts (balance sheets and profit & loss account) in support of this. (Relevant documents, meeting above requirements at C & D, shall be submitted by bidders.)		
D	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)		By BHEL
E	Approval of Customer (if applicable) Note: Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval.	NOT APPLICABLE	BY BHEL

F	Price Bid Opening Note: Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E		BY BHEL
G	Consortium criteria (if applicable)	NOT APPLICABLE	
<p><u>Explanatory Notes for the PQR (unless otherwise specified in the PQR):</u></p> <p>1.If the Qualifying work is executed in the last seven years period, as specified above, even if it has been started earlier, the same will also be considered meeting the qualifying requirements.</p> <p>2. The word 'work of similar nature' means Pre-Boiler Flushing & Chemical cleaning of Boiler along with supply of temporary system consists of pumps & pipes.</p>			

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

ANNEXURE - 2**CHECK LIST**

NOTE:- Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (<input type="checkbox"/>) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with PRE QUALIFICATION CRITERIA (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
7	Audited profit and Loss Account for the last three years	Applicable/Not Applicable	YES/NO
8	Copy of PAN Card	Applicable/Not Applicable	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable/Not Applicable	YES/NO
10	Integrity Pact	Applicable/Not Applicable	YES/NO
11	Declaration by Authorised Signatory	Applicable/Not Applicable	YES/NO
12	No Deviation Certificate	Applicable/Not Applicable	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable/Not Applicable	YES/NO
14	Declaration for relation in BHEL	Applicable/Not Applicable	YES/NO
15	Non Disclosure Certificate	Applicable/Not Applicable	YES/NO
16	Bank Account Details for E-Payment	Applicable/Not Applicable	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable/Not Applicable	YES/NO

18	Tie Ups/Consortium Agreement are submitted as per format	Applicable/Not Applicable	YES/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/Not Applicable	YES/NO
20	Analysis of Unit rates	Applicable/Not Applicable	YES/NO

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED ABOVE APPLICABLE DOCUMENTS ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)

Against this enquiry for the subject item / system with detailed scope of supply as per our tender specification, BHEL-PSNR, NOIDA may resort to "REVERSE AUCTION PROCEDURE" i.e. **ONLINE BIDDING on INTERNET.**

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. 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.
3. In case BHEL decides to conduct reverse auction, BHEL's service provider shall contact the vendor directly and impart them the training.
4. Business rules like event date, time, start price, bid decrement, extensions, etc. also will be communicated through service provider for compliance.
5. Vendors have to fax the compliance form in the prescribed (provided by service provider) before start of Reverse auction. Without this the vendor will not be eligible to participate in the event.
6. **Total Price quoted shall be inclusive of all taxes except service tax in line with the NIT conditions for the subject work in Indian Rupees (INR), which is to be worked out as per the BOQ (Rate Schedule) given in tender enquiry and subsequent changes made, if any. EXCEL Sheet shall be provided, if applicable.**
7. Reverse auction will be conducted on schedule date & time.
8. At the end of reverse auction event, the lowest bidder value will be known on the network.
9. The lowest bidder has to fax the duly signed filled-in prescribed format as provided on case-to-case basis to BHEL through service provider after completion of event on the same day preferably.
10. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vender to conduct business with BHEL as per prevailing procedure.
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 standard practice.

Authorization of representative who will participate in the on line Reverse Auction Process;

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

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TECHINICAL CONDITIONS OF CONTRACT (TCC)

TENDER NO. BHEL/NR/SCT/ANPARA D/CHEM-CLEAN/925

FOR

**PRE-BOILER FLUSHING & CHEMICAL CLEANING (EDTA) OF BOILERS OF UNIT
NO.6 & 7 AT 2X500 MW ANPARA D TPS.**



Bharat Heavy Electricals Limited
(A Govt. Of India Undertaking)
Power Sector – Northern Region,
Plot No. 25 , Sector - 16A ,
Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA

TENDER NO. BHEL/NR/SCT/ANPARA D/ CHEM-CLEAN/925

Sl.No.	Description	Chapter No.	Page No.
1.	Project Information	Chapter-I	
2.	Scope of Works	Chapter-II	
3.	Facilities in the scope of Contractor/BHEL (Scope Matrix)	Chapter-III	
4.	T&Ps and MMEs to be deployed by Contractor	Chapter-IV	
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8.	Taxes and other Duties	Chapter-VIII	
9.	Others	Chapter-IX	
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11.	Unpriced Rate Schedule	Chapter-XI	

Chapter - 1: Project Information

Name of the Owner	:	Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd (UPRVUNL)
Address	:	Anpara-D Thermal Power station District- Sone bhadra Uttarpradesh
Installed capacity	:	New Project
Nearest Railway station:		Singrauli -- 20 km Renukoot -- 40 km Varanasi -- 200 km
Nearest City	:	Varanasi-200 Km
Nearest Airport	:	Varanasi - 200 km
Maximum Temperature	:	48 Deg C
Minimum temperature	:	Approx 2 Deg C

2.0 SCOPE OF WORK

- 2.1 BHEL has been awarded the work of Design, Manufacture, supply, installation, erection & commissioning of BTG & associated civil works package of **2x500 MW Units at Anpara D TPS by UPRVUNL**. The equipment consists of Boiler, Electro-static precipitator, Fans, milling systems, steam turbines, generators, boilers feed pumps, condensate extraction pumps and piping along with the associated auxiliary supports and controls.
- 2.2 The steam Generator is a controlled circulation boiler with rifled water wall tubes.

Boiler Design Data:

SH outlet Pressure	- 179 Kg/cm ²
SH outlet Temperature	- 540 ° C
Feed Water Temperature (at eco inlet)	- 255 ° C
Maximum Continuous Rating	- 1625 t/h

WATER HOLDING CAPACITY

1. Circulation System	-178 m ³
2. Drum (full)	- 60 m ³
3. Economizer	-105 m ³
4. Superheater ..	-167 m ³
5. Reheater	-173 m ³

2.3 The scope of work under this tender broadly consists of:

- 2.3.1 Pre boiler flushing consists of alkali flushing of feed lines, condensate lines, drip lines, deaerator and heaters etc. Then Chemical cleaning (by using EDTA) of Boiler of Unit No.6 &7.
- 2.3.2 The Bill of Temporary Material indicated in **Annexure I (BHEL supplied)** for carrying out chemical cleaning to be provided by BHEL as free of cost. The contractor will transport this material from stores/location of the material to the site of erection and after completion of chemical cleaning these material to be dismantled and returned to the BHEL store. Tentative scheme is enclosed with the specifications .The actual scheme of pipelines for the chemical cleaning and flushing process will be provided by BHEL at site.

Note; Any loss /damage of the BHEL material will be recovered from the contractor at the prevailing market rates.

- 2.3.3 MS tanks (60 cu. M) for mixing the chemicals and 50 Cu. M for storage of EDTA will be design, fabricated by contractor at site only. The material for the fabrication will be provided by BHEL. The tentative BOM of the MS tanks as per **Annexure-II**. After completion of Chemical cleaning MS tanks to be dismantled and plates, angles, channels to be returned to the BHEL store.

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- 2.3.4 The Bill of Temporary Material indicated in **Annexure III (in contractor scope)** for carrying out chemical cleaning to be arranged by successful bidder within lump sum quoted price. All required materials listed in the specifications or even any additional requirement to perform and complete the process shall be provided by the contractor within the awarded price. The bidder must take care of such variations in their offer
- 2.3.5 All the consumables including reagents for the successful completion of chemical cleaning will be supplied by the contractor in lump sum quoted rate.
- 2.3.6 Chemicals required for chemical cleaning of boilers will be supplied as a free issue item by BHEL/ owner. They are to be received, transported, preserved, used and handled by the contractor.
- 2.3.7 During the EDTA process, all the permanent boiler instruments are isolated except providing a temporary pressure gauge of suitable capacity in the drum for monitoring pressure in the drum during Chemical cleaning using EDTA.
- 2.3.8 Provisions should be made at the following locations for the measurement of temperature:
- A) Two locations in the drum (left & right) for the measurement of boiler Water temperature. Long thermocouples of around 400 mm length or required length shall be installed directly in the spare / unused stubs in the drum
 - B) Water wall metal temperature measurements as given below:
At AB elevation, 4 number thermocouples shall be installed on corner water wall tubes (outside the furnace) and at GH elevation 2 numbers thermocouples shall be installed in the front and rear water wall (outside the furnace) at accessible locations.
 - C) Two more thermocouples with pads one each at left and right side of ECO coil shall be welded at suitable locations, inside the boiler (or penthouse) to measure the metal temp in the gas side.
- (Totally 06 nos. thermocouples will be used for measurement of water wall tube metal temperature and 02 nos. for economizer tube temperature)
- 2.3.9 Peening type temporary thermocouples are to be provided in the temp measurement points on the water walls and economizer. Provision has to be made for monitoring temperature in the control room. Instrument cables for measurement of temperature should be temperature compensated. They are to be laid from the measuring instrument to the control room.
- 2.3.10 Thermocouples to be used should be accurate in the range of 0-200°C. All the instruments pressure & temp. Gauges should be calibrated with valid calibration certificates.
- 2.3.11 To get representative samples of the process solution, sampling points with sample coolers are to be provided at the following locations:
- A) Drum water sample to be drawn from CBD sampling cooler and from a spare tapping point in water side through the permanent saturated steam cooler.

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- B) Two numbers of sampling point is to be provided from bottom ring header through hand-hole cover.
 - C) One number of sampling line to be drawn from the middle CC pump casing (which is to be run during acid cleaning)
- 2.3.12 Temporary drum level indications – 02 in numbers, one at the control room and the other near circulating pumps – along with electric bulbs, switches and cables are to be provided.
- 2.3.13 Two nos. temporary gauge glasses are to be erected by the contractor for local drum level indication. Temporary gauge glasses (range 900mm) will be supplied by the contractor.
- 2.3.14 Other than master drain all other drains of water wall and economizer connected to common low point header can be kept open for eco recirculation purpose.
- 2.3.15 All drum internals can be kept installed.
- 2.3.16 Only the source of power will be provided by the owner at one point at project site. Cables from the source of power to power distribution boards, Motor control centers and to individual equipment are to be provided and laid by the contractor. Earthing of individual motors is to be provided by contractor.
- 2.3.17 Chemical cleaning system / equipment is to be completed as per the approved scheme.
- 2.3.18 All temporary connections to the existing systems, all modifications in existing pipelines, valves and in civil works are to be normalized by the contractor after pre-boiler flushing and chemical cleaning of boiler. All temporary supports erected for these operations are to be removed by the contractor after completion of the operations.
- 2.3.19 Laboratory equipment's for testing of chemicals along with chemical reagents for testing are to be arranged by contractor. Testing personnel (chemists) are to be arranged by the contractor.
- 2.3.20 Electrical testing equipment like tong-tester, multimeter, megger etc. are to be arranged by the contractor. Ammeter for each motor is to be provided in its MCC.
- 2.3.21 Civil works related to pumping units, supports etc are to be carried out by the contractor.
- 2.3.22 All temporary lines are to be hydraulically tested (at working pressure of fluid) as required.
- 2.3.23 The contractor has to make arrangement for pumping out the spent/ neutralized EDTA after 15 days of aeration from neutralizing pit to a suitable location. Proper effluent treatment arrangement is to be made available at site. A neutralizing pit of suitable capacity is to be made.
- 2.3.24 The contractor shall fabricate pipes, special bends, etc. threading and welding as required.

- 2.3.25 The contractor shall erect & test all the piping systems, covered in the specification including sampling lines, hangers & supports, valves & accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, pre-heating, stress relieving, testing, cleaning. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except where flanged screwed or other type joints are specified or shown on the drawings. All piping shall be erected true to the lines & elevation as indicated in the drawings.
- 2.3.26 Wherever piping erected by the contractor is connected to equipment/ piping erected by the other agencies the joint at the connecting point shall be the responsibility of the contractor of this specification.
- 2.3.27 The contractor shall be responsible for correct orientation of all valves so that seats, stems & hand wheels will be in desired location. It is the responsibility of the contractor to obtain the information regarding orientation of valves not fully located on drawings before the same are installed.
- 2.3.28 The adjustment of all supports erected for maintaining the proper slopes of piping wherever required is also included in the scope of the contractor.
- 2.3.29 No temporary supports should be welded on the piping. In case of absolute necessity prior approval should be taken from BHEL Engineer. In such cases heat treatment if required, shall be carried out by the contractor as part of subject work.
- 2.3.30 All supports and anchors shall be installed to obtain safe and reliable and complete pipe installation as per instructions of Engineer. Any additional support as called for by Engineer shall have to be fabricated and provided by the contractor. Contractor shall install piping in such a way that no excessive or destructive expansion forces exist under any condition. The contractor shall ensure that all supporting elements, anchors & restraint have been installed and adjusted in accordance with the drawings / sketches & other written instructions of the Engineer.
- 2.3.31 All the valves, including motorised valves, flap valves, etc. shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre-commissioning also. Welding or jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates.
- 2.3.32 Additional platforms and ladders of permanent nature incidental to the job for approaching different equipment/ valves as per site requirement, which may not be indicated in drawings, shall be fabricated and installed by the contractor. The materials required will be supplied by BHEL free of cost.
- 2.3.33 Erection and welding of necessary instrumentation tapping points, valves to be provided on equipment, auxiliaries and pipe lines covered within the scope of this specification, will also be the responsibility of the contractor and will be done as per the instructions of BHEL Engineer at no extra cost.

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2.3.34 BHEL shall have lien on all T&P's, IMTEs & other equipment of the Contractor brought to the Site. BHEL shall continue to hold the lien on all such items throughout the period of Contract. No material brought to the Site shall be removed from the Site by the Contractor or his Sub-contractors without the prior written approval of the BHEL Engineer.

2.3.35 Adequate number of safety equipments like goggles, masks, aprons, gloves, gum boots etc. are to be arranged by the contractor.

Minimum requirements for a boiler shall be as under

Gum boots (various sizes)	6 Pairs
Rubber gloves	6 Pairs
Rubber or Polythene aprons	6 Nos
Helmets	12 Nos
Safety goggles plain glass	6 Nos
Face mask (transparent, plastic)	6 Nos

First aid box Containing dilute ammonium hydroxide, 50% sodium bicarbonate solution, eye lotion, bandages, tincture of iodine, cotton, burnol etc.

2.4 Tentative Chemical Cleaning Process Procedure is as follows:

2.4.1 ALKALI FLUSHING:

2.4.1.1 The requisite quantities of (a) Tri-sodium Phosphate (TSP) & (b) Di Sodium Hydrogen Phosphate to be added to the mixing tank along with DM Water and the solution will be thoroughly mixed by recirculation so that final solution in the Boiler contains 0.1 % TSP and 0.05 % DSP. The solution will be injected into the boiler through the bottom ring header drains and economizer drain operating the chemical filling pump. Further DM water will be taken in the boiler up to normal level.

2.4.1.2 Light up the boiler as per O&M instructions and gradually raise the boiler water temperature to 130–140 °C. Trip the boiler and keep the fans running for cooling. Keep one CC pump running.

2.4.1.3 After 30 minutes, stop the running CC pump. Drain the boiler at 90 °C to the plant water disposal system, by keeping open the drain valves fully (without any throttling). The drain solution will be diluted with plenty of service water.

2.4.2 HOT WATER RINSE:

2.4.2.1 Once the draining is completed, refill the boiler with de-mineralised water and light up the boiler. Gradually raise the boiler water temperature to 130-140°C. Trip the boiler and keep the fans running for cooling.

2.4.2.2 During all rinsing operations (hot & cold) all the CC pumps are to be made ready and to be operated in rotation.

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2.4.2.3 After 30 minutes stop the running CC pump and drain the boiler in the hot condition to the plant's water disposal system by keeping open the drain valves fully (without throttling). The pH and PO₄ will be measured in the drain water. The pH and PO₄ are to be reduced to a level below 7.5 and 10 ppm respectively

2.4.3 COLD WATER RINSE:

2.4.3.1 Cold water rinses will be done by fill and dump method. During these steps, draining will be done to the plant's water disposal system. pH will be monitored during draining of each cold water rinse stage. The rinsing operation will be continued until the pH of the drain water is almost equal to pH of inlet water used for rinsing.

2.4.3.2 Flush all sampling and blow down lines. Check all temperature / pressure measurements relevant to the process for monitoring at UCB and ensure their reliability.

2.4.4 LIGHTING UP:

2.4.4.1 Drum air vents, SH air vents & start up vents are to be opened before lighting up the boiler.

2.4.4.2 Initiate boiler light up as per O & M instructions.

2.4.4.3 Drum level is to be monitored closely and controlled below normal level by operating down comer blow down from UCB or draining and filling the boiler at drain header. Drum level Temporary indication shall be displayed at UCB and near drain header.

2.4.5 ACID CLEANING & PASSIVATION:

2.4.5.1 In this process the mixture of chemical solutions containing EDTA, inhibitor, ammonia (if required) and hydrazine in DM water is filled in the boiler. Boiler is fired and the temperature raised to 140-1450 C and held for 4 hours and subsequently cooled. The removal of deposit constituents and subsequent Passivation of the metal surfaces will occur during this single step.

2.4.5.2 The required quantity of ammoniated EDTA (40% wt / wt) solution will be kept ready in the EDTA storage tank.

2.4.5.3 The inhibitors "BHELMAX" & "BHELSOL", Hydrazine hydrate and ammonia for addition in the Chemical dissolving tank will also be made available near the mixing tank.

2.4.5.4 All the Boiler Blow down valves are kept shut and drum vent valves & start up vent open during boiler filling.

2.4.5.5 40 Cu.m of DM water will be drawn in the dissolving tank. The temporary chemical fill pump will be started and system put into recirculation. The required quantity of Ammoniated EDTA (40% wt/wt) solution will be transferred from the EDTA storage tank to the dissolving tank. The EDTA concentration in the dissolving tank will be checked. Transferring the

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EDTA solution will be stopped, when the EDTA concentration reaches around 3 + 1% by weight. Required quantity of Hydrazine hydrate and inhibitors (BHELMAX & BHEL SOL) will also be added. Recirculation will be done till all the chemicals uniformly mixed up. With this one batch of EDTA Chemical solution will be ready for filling into the boiler.

2.4.5.6 The approx. quantities of various chemicals that are to be mixed per batch of 40 m³ is given below:

1. EDTA ammoniated (40 %) concentrate: 3 to 4 m³
2. BHELMAX : 60 kgs
3. BHEL SOL : 60 lit
4. N₂H₄.H₂O (80%) : 60 litres

Ammonia will be added if required to adjust the pH between 9.0 to 9.8. DM water will be used to make up to 40 m³.

This solution will be filled into the Boiler through LP drain header with the temporary chemical fill pump.

The cleaning solution is quite harmless w.r.t corrosion and hence there is no time limitation for filling the boiler and retaining the solution inside the boiler.

2.4.5.7 Repeat the preparation of Chemical solution and batch filling as explained in point no 8.4.5 till water level in the drum reaches the center line of the gauge glass

The composition of the filling solution shall be as below:

EDTA content	:	3 + 1% W/v
Hydrazine	:	1000 ppm (min)
pH	:	9.0 to 9.8

2.4.5.8 The boiler will be lighted up as per normal operating procedure with minimum firing rate (say 2 oil guns in AB elevation)

2.4.5.9 The drum and super heater vents are to be closed when steaming starts, say at 1 kg / sq. cm. in the drum and keep the SH start up vent crack open.

2.4.5.10 The drain valve in S.H. header –1 will be kept in crack opened condition.

2.4.5.11 Note the time at which the temperature of boiler water reaches 110 °C.

2.4.5.12 Continue raising the temperature of boiler water to a saturation temperature of 140 °C.

2.4.5.13 Once the temperature of boiler water reaches 140 °C, control the firing rate in such a way that the boiler water temperature is maintained at 140 to 145 °C, for a min period of 4 hours. Then trip the boiler but continue running of CC pump.

2.4.5.14 Continue running the ID / FD fans to bring down the boiler water temperature. In case it appears that the results of iron concentration may not level out when temp is expected to be 110°C, ID/FD fans shall be stopped, suitably, during the cooling down phase & boiler shall be boxed

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up with CC pump running and kept in this condition to achieve the EDTA contact period of 8 hours with temperature exceeding 1100C.

- 2.4.5.15 Samples have to be taken every 30 minutes from the sampling points at locations given as per 7.3, from the time when the temperature in the system has reached 1100C and analysed for pH, EDTA concentration, and Iron content.
- 2.4.5.16 After attaining the completion criteria of pickling process, as per clause 2.4.6, the system shall be allowed to cool with the ID & FD fans in operation (ID & FD fans are to be restarted, in case they have been stopped to meet the completion criteria, to bring down the boiler water temperature). Open the drum air vents when the pressure reaches to 1 kg/sq.cm.
- 2.4.5.17 Boiler water temperature & Water Wall metal temperature at the locations indicated as per 7.2 are to be measured and logged.
- 2.4.5.18 When the temperature comes down to 950C, stop the running CC pump and the system shall be drained completely in hot condition to the effluent pit by opening all the drain valves.

2.4.6 PROCESS COMPLETION CRITERIA:

- 2.4.6.1 Cleaning process is to be continued till iron concentration in three consecutive samples show equilibrium status.
- 2.4.6.2 When the iron concentration in the cleaning solution is constant, it indicates that all the oxides have been dissolved. However, a minimum EDTA contact period of 6 hours from the time of attaining the required temperature (110 deg. C) shall be allowed.
- 2.4.6.3 If the iron concentration values do not level out and attain equilibrium status, regardless of analytical results, the EDTA contact period with temperature exceeding (1100C) shall not be allowed for more than 8 hours (approx).

2.4.7 TREATED DM WATER RINSING:

- 2.4.7.1 Prepare a blended solution of ammonia & Hydrazine with calculated quantities in the Dissolving tank in order to achieve a solution pH 9.0 to 9.5 and hydrazine content 50 ppm in the DM water being filled in the boiler.
- 2.4.7.2 Fill the boiler with the above treated DM water through low point drains and economizer as practiced earlier, up to just above the centre gauge glass.
- 2.4.7.3 Start the middle CC pump and light up the boiler as per O&M instruction. Drum level will drop after starting the CC pump. Again fill the boiler with treated DM water solution to make up the level up to 100 mm above NWL.
- 2.4.7.4 Raise boiler water temperature up to 1200C and then shut down the boiler. Allow the boiler to cool down naturally.

- 2.4.7.5 When the boiler water temperature comes down to 95 °C stop the CC pump and drain the boiler to the effluent pit and allow the system for natural aeration.
- 2.4.7.6 Open upper & lower drums for inspection. Manually clean the drums if required.
- 2.4.7.7 Fit the bottom drum internals and restore the boiler and prepare it for regular operation for steam blowing, safety valve floating etc.

2.4.8 INSPECTION CRITERIA:

- 2.4.8.1 The test coupons placed at identified locations will be taken out. All coupons shall be free of deposits and shall have uniform coating of the protective layer.
- 2.4.8.2 The drum surface shall be visually inspected for uniform smooth coating of protective layer.
- 2.4.8.3 The low point headers will be inspected and loose debris if any, will be removed.

2.4.9 CHEMICAL CLEANING WASTE TREATMENT & DISPOSAL

- 2.4.9.1 Treatment and disposal of the waste and effluents of the chemical cleaning process shall comply with the requirements / stipulations of State Pollution Control Board norms.
- 2.4.9.2 Hot DM water flushing shall be drained into plant normal drain.
- 2.4.9.3 The organic spent EDTA chemical solution after the cleaning process is drained into a pit. The pH of the effluent will be in the range of 8.5 to 9.0 and hence no treatment for pH adjustment is required as it would meet the pH requirement for disposal.
Typical relative composition of the process solution (Temp. 75 °C) immediately after draining is given below:
EDTA < 15 g/l
N₂H₄ < 0.05 g/l
Fe < 10.0 g/l
- 2.4.9.4 Compressed air shall be used to destroy the residual Hydrazine & organics and the effluent shall be disposed after aeration for 10 days, as per state pollution control board norms. Effluent will be disposed to ash dyke in installments through existing ash slurry system (The organic chemical is completely bio-degradable).

2.4.10 NOTE:

- 2.4.10.1 Drains to be provided at lowest points of temporary piping.
- 2.4.10.2 All temporary connections to Boiler should be of good quality. They will be hydraulically tested at 14 kg/cm² with the temporary boiler filling pump.

- 2.4.10.3 Service water supply should be available near the pump operating areas.
- 2.4.10.4 Additional Check lists/Modifications in the lay-out, if found necessary, to be made at site in consultation with site Commissioning In-charge.
- 2.4.10.5 All the sampling points along with sample coolers and the temperature measurement points with necessary thermocouples shall be provided as indicated in 7.3 & 7.2 respectively.

2.4.11 TERMINATION CRITERIA AT A GLANCE

Termination Criteria for each step will be as follows:

- 2.4.11.1 Alkali Flushing, Hot water flushing & cold water rinses:

pH: < 7.5
PO4 < 10 ppm

Acid cleaning & Passivation:

- 2.4.11.2 Cleaning process is to be continued till iron concentration in three consecutive samples show equilibrium status.
- 2.4.11.3 When the iron concentration in the cleaning solution is constant, it indicates that all the oxides have been dissolved. However, a minimum EDTA contact period of 6 hours from the time of attaining the required temperature (110 °C) shall be allowed.
- 2.4.11.4 If the iron concentration values do not level out and attain equilibrium status, regardless of analytical results, the EDTA contact period with temperature exceeding 110°C shall not be allowed for more than 8 hours (approx).
- 2.4.11.5 Declare the completion of pickling process once the EDTA strength and iron concentration level out and reach equilibrium.

Treated DM Water Rinsing:

- 2.4.11.6 Completion criteria will be with one treated DM water rinse.

2.4.12 Inspection criteria:

- 2.4.12.1 The test coupons placed at identified locations will be taken out. All coupons shall be free of deposits and shall have uniform coating of the protective layer.
- 2.4.12.2 The drum surface shall be visually inspected for uniform smooth coating of protective layer.
- 2.4.12.3 Chemical Cleaning Waste Treatment & Disposal:
pH: 5.0 to 9.0
The effluent will be disposed after ten days of aeration as per local Pollution control board norms.

2.5 EMERGENCY PROVISIONS

- 2.5.1 Flushing and washing water supplies
- 2.5.2 Ample supplies of tepid flushing and washing water supplies shall be provided at all possible points of discharge, spillage or escape of chemicals.
- 2.5.3 Adequate provisions shall be made for emergency treatment of the eyes, comprising eye wash bottles, located conveniently to places where discharge, spillage or escape of chemicals can occur.
- 2.5.4 Safety shower shall be provided.
- 2.5.5 A suitable first aid treatment room with outside telephone facilities shall be provided within a reasonable distance of the place where chemicals are being used.
- 2.5.6 The protective clothing and apparatus required for emergency use shall be made available near the acid cleaning area.

2.6 FIRST AID TREATMENT

- 2.6.1 Splashes of the eye
- 2.6.2 Immediately flood the eye with water. To be effective the eyelids must be opened. The eyelids should be pushed apart using the thumb and index finger of the left hand. The casualty will probably not be able to open the eye himself because of painful spasms.
- 2.6.3 If an eye wash bottle is used the jet should not be directed at the front of the eye. It should be directed in from the side, so that flow is over the surface of the eye.
- 2.6.4 Irrigation should be continued for 5 – 10 minutes after which the casualty should be taken to the first aid room.
- 2.6.5 Irrigation should be continued in the first aid room. Remember vision is saved by thorough irrigation; no other treatment can prevent damage if this is omitted.
- 2.6.6 After thorough irrigation the eye should be covered with a pad; the patient should be referred for medical opinion.

2.7 Irritation of the skin

- 2.7.1 If signs of skin irritation occur, the persons should be removed from contact and referred for medical opinion. In the event of the splashing of the skin with chemicals the effected area should be washed thoroughly avoiding spreading contamination to the face and eyes.
- 2.7.2 Test area will be cordoned off and unauthorized persons entry shall be prohibited. Suitable signboard shall be displayed.

2.7.3 Whenever any inspection is made during the cleaning process, the location should be adequately ventilated.

2.8 EMERGENCY PROCEDURES:

2.8.1 The testing team should be aware of the operating procedures of fire extinguishers to be used for quenching minor or major fires.

2.8.2 The testing team should be aware of the procedure to be followed in case of accidents involving personnel injury.

2.8.3 In case of failure of running pump the stand by pump should be started immediately without delay.

2.8.4 An operator posted at the pump area, should be instructed to stop the pumps and properly isolate the system in the event of emergency. All operators should be well conversant with the emergency operating instructions.

2.9 PROCEDURE FOR DETERMINATION OF TOTAL EDTA CONCENTRATION IN PROCESS SOLUTION DURING CHEMICAL CLEANING.

1. PRINCIPLE OF THE METHOD:

EDTA reacts with Zirconium ions under strong acid conditions to form a chelate. The end point of the titration is indicated by a Xylenol orange indicator.

2. REAGENTS AND APPARATUS REQUIRED:

APPARATUS:

1. Erlenmeyer flask 300 ml capacity.
2. Pipettes
3. Hot plate
4. Magnetic stirrer

REAGENTS

1. Hydrochloric acid (conc.)
2. Standard Zirconium oxy chloride ($ZrOCl_2 \cdot 8H_2O$) 0.1 M solution in 1 N HCl (Take a 1000 ml volumetric flask and add 32.23 gram of $ZrOCl_2 \cdot 8H_2O$ and add DM water to about 500 ml. To this add 85 ml of conc. HCl. Make up to 1000 ml mark with DM water and mix well)
3. Ascorbic acid
4. Xylenol orange indicator.

3. TEST PROCEDURE :

1. pipette out 10 cc of the water sample into a 300 ml Erlenmeyer Flask.
2. Add 10 ml of conc. HCl (the pH value is about 1.0)
3. Add a spatula of ascorbic acid.

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4. Boil of the solvent on the heating plate for about 5 minutes. (The yellow colour of the ferric ion should disappear due to reduction to ferrous iron.
5. Immediately after the addition of 0.05 ml of 0.05 % xylenol orange indicator the sample is titrated with 0.1M $ZrOCl_2$ until the colour changes from yellow to red violet; The colour changes from yellow to red violet. The colour change shall remain constant for at least 3 min.

4. CALCULATION :

The total EDTA concentration % = Volume of 0.1M $ZrOCl_2$ consumed x 0.292

2.10 PROCEDURE FOR THE DETERMINATION OF TOTAL IRON CONCENTRATION IN PROCESS SOLUTION DURING CHEMICAL CLEANING.

1. APPARATUS REQUIRED:

1. HACH DR/890 COLORIMETER
2. Volumetric flasks
3. Pipettes
4. Measuring cylinders

2. REAGENTS REQUIRED:

1. FerroVer reagent powder pouches (Supplied by HACH)

3. TEST METHOD:

1. Sample to be diluted with DM water so that the concentration of Iron will be less than 3.00 ppm in the test solution.
2. 25 ml / 10 ml of the diluted solution will be taken in the cuvette. This will be used as a blank.
3. Place the blank in the cell holder and cover the sample cell with the cap.
4. Zero the equipment and display will be showing 0.00 mg/L Fe.
5. Fill another sample cell with 25/10 ml sample
6. Add the contents of one FerroVer Iron Reagent Powder Pillow to the sample cell (the prepared sample). Cap and invert to dissolve the reagent powder.
7. Start the timer for 3 mts period.
8. Place the prepared sample into the cell holder. Cover the sample cell with the instrument cap.
9. Press READ
10. The concentration will be displayed
11. Multiply with dilution factor and report the ppm/ g/lit of Fe concentration

2.12 ESTIMATION OF HYDRAZINE.

1. REAGENTS .

- a. Standard Potassium bromate 0.1 N

Dissolve 2.7836 gram of Potassium bromate ($KBrO_3$) and 10 gram of Potassium bromide (KBr) in DM / Distilled water and make up to 1000 ml.

- b. 0.1 % Methyl orange indicator solution.

- c. Hydrochloric acid (conc.) AR.

2. PROCEDURE.

- a) place 10 ml of sample in a titration flask.
- b) Add 10 ml of conc. HCl.
- c) Add about 5 drops of Methyl orang indicator.
- d) Titrate with standard $KBrO_3$ titrant to the first appearance of yellow colour.

3. CALCULATION.

Hydrazine as N_2H_4 , ppm = titre value X 80.

Note: All the procedure mentioned above is tentative and for information only.

2.11 PRELIMINARY and CIVIL WORKS

1. Before starting erection job contractor shall ensure that area connected to his scope of work is sufficiently enclosed against ingress of dust and water and all debris have been cleared of from the floor to a designated area as per instruction of engineer. The contractor shall arrange to get the working area and surroundings cleared daily to ensure the dust free atmosphere and free from seepage water for working and shall maintain sufficient labour and general cleaning of work areas. Delay of work on this account will not be acceptable.
2. The contractor shall cover all opening on floor and put temporary hand railing on all sides of the floor to avoid any accident to the working personnel.
3. Any civil works required for safe and efficient operation of tools and tackles like grouting/ excavation/ casting of foundation/ anchor points for derricks, winches, guy ropes fastening scaffoldings etc. or any other temporary supports shall also be the contractor's responsibility. For these civil works all materials including cement/ steel and required facilities will have to be arranged by contractor at his own cost.
4. The contractor shall provide his tool stores for special tools and instruments at a convenient place near to the place of working area.

2.12 Welding requirements.

1. Contractor must ensure that the welders involved in the job are qualified as per BHEL/UPRVUNL procedures & statutory requirement (preferably IBR welder to be used)
2. Contractor to procure and use only BHEL/UPRVUNL approved welding electrodes.

3. Contractor to ensure storage, drying facilities of the welding electrodes as per BHEL norms.
4. Suitable edge preparation is required to make prior to carry out the welding.
5. Contractor to ensure proper cleaning of welds between the beads
6. No visible cracks, pinholes or incomplete fusion are allowed.
7. Under cuts should not exceed 1 mm.

2.13 **GENERAL**

Contractor shall ensure following:

- I. Contractor has to maintain contact with local hospital having ambulance facility, scanning & other ultra modern medical facilities required during emergency.
- II. Contractor has to ensure pre-employment medical check for all staff & workers.
- III. Contractor has to ensure that adequate First Aid facilities with trained nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, following

- Male nurse (in shifts)
- Oxygen set up
- Breathing apparatus
- Eye wash facility
- Stretcher
- Trauma blanket
- Medicines

In addition to above, BHEL (through its another contractor) has arranged ambulance at work site for emergency purpose, which can be utilized by contractor in case of emergency. The charges for the same will be decided mutually at site. In case, under unavoidable circumstances, if the ambulance is not available/ being used elsewhere, the contractor will have to arrange for the same as under clause A. (I).

B. The contractor shall comply with following towards Social Accountability;

- a) The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged, the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.
- b) The contractor shall not engage Forced/ Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976.
- c) The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act, 1970.

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- d) The Contractor shall abide by UN convention w.r.t. Human Rights and shall be liable for Discrimination/ Corporal punishment for failure in meeting with relevant requirements.
- e) The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours.
- f) The Contractor shall abide by the Statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.
- g) The Contractor shall arrange potable drinking water to its employees & workers.

Chapter - III: Facilities in the scope of Contractor/BHEL

3.0 FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL

S.No.	Description	Scope /to be taken care by		Remarks
		BHEL	CONTRACTOR	
1.1.0	ESTABLISHMENT			
1.1.1	FOR CONSTRUCTION PURPOSE			
A.	Open space for office	YES		Free of charge. As & where made available by M/s UPRVUNL/BHEL
B.	Open space for storage	YES		Free of charge. As & where made available by M/s UPRVUNL/BHEL
1.1.2	FOR LABOUR COLONY			
A	Open space	YES		Free of charge. As & where made available by M/s UPRVUNL/BHEL
1.2.0	ELECTRICITY			
1.2.1.	Electricity for construction purposes (chargeable/free)			Free of Charge.
1.2.1.1	Single point source	YES		
1.2.1.2	Further distribution for the work to be done which include supply of materials & execution		YES	
1.2.2	Electricity for the office, stores, canteen etc of the bidder which include:			

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1.2.2.1	Distribution from single point including supply of materials & service		YES	
1.2.2.2	Supply, Installation & connection of material of energy meter including operation & maintenance		YES	
1.2.2.3	Duties & deposits including statutory clearances for above		YES	
1.2.2.4	Demobilization of the facilities after completion of works		YES	
1.2.2.5	Electricity for living accommodation of the bidder's Staff, engineers, supervisors etc. on the above lines		YES	Chargeable basis at the rate as fixed by BHEL's Customer M/s UPRVUNL.
1.3.0	WATER SUPPLY			
1.3.1	FOR CONSTRUCTION & LABOUR COLONY:			
1.3.1.1	Making the water available at single point	YES		FREE OF CHARGE.
1.3.1.2	Further distribution as per the requirement of work including supply of materials & execution		YES	
1.4.0	LIGHTING			
1.4.1	For construction work (supply of all materials) 1. At office storage area 2. At preassembly area 3. At construction site/area		YES	
1.4.2	For construction work (execution of lighting work/arrangements) 1. At office storage area 2. At preassembly area		YES	

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	3. At construction site/area			
	Providing the necessary consumables like bulbs, Switches, etc during the course of construction		YES	
1.5.0	Communications facilities for site operations of the bidder			
	Telephone, fax , internet ,intranet, email etc.		YES	
1.6.0	COMPRESSED AIR SUPPLY			
1.6.1	Supply of compressor and all other equipments required for compressor & compressed air system including pipes, valves,storage system etc.		YES	
1.6.2	Installation of the above system and operation & maintenance of the same		YES	
1.6.3	Supply of all the consumables for the above system during the contract period.		YES	
	ERECTION FACILITIES			
2.1.1	Providing erection drawings for all the Equipments covered under this scope	YES		
2.1.2	Drawings for construction method	YES	YES	In consultation with BHEL
2.1.3	As-built-drawings-where ever deviations Observed & executed and also based on Decisions taken at site		YES	do
2.1.4	Shipping lists etc for reference & planning the activities	YES	YES	do
2.1.5	Preparation of site erection schedules and other input requirements		YES	do
2.1.6	Review of performance & revision of site erection schedules in order to achieve the end dates & commitments	YES	YES	do
2.1.7	Weekly erection schedule based on SI. No.2.1.5		YES	do
2.1.8	Daily erection/work plan based on SI. No.2.1.7		YES	do

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2.1.9	Periodic visit of senior official of bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two month		YES	
2.1.10	Preparation of preassembly bay		YES	

- 3.1 BHEL will not be responsible for any loss or damage to the contractor's equipment as a result of variation in voltage or frequency or interruptions in power supply.
- 3.2 The Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.
- 3.3 Provision of distribution lines of both electrical power and water from the central points to the required place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS/ Copper / Brass clamps, copper conductor, change over switches pipes etc. at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.
- 3.4 The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points.
- a) All electrical installations should be as per Indian Electricity rules.
 - b) All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.
 - c) Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.
 - d) All electrical connections should be made through connectors, nuts and bolts, switches, plug and sockets. Loose connections or hooking up of wires shall not be permitted.
 - e) Contractor have to make their own earthing arrangement for their equipment / DB earthing.
 - f) All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
 - g) Contractor should use "MCCB" and "ELCB" either on incoming or outgoing connections to the DBs.
 - h) Contractor should ensure that all the CBs / TPNs/ Fuses/ MCCB / ELCB cables etc. should be of adequate rating/ capacity.

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- i) For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.
- 3.5 Adequate lighting arrangement such as flood lights, hand lamps and area lighting shall be arranged by the contractor at the site of construction, storage area etc within finally accepted rates
- 3.6 In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.
- 3.7 The contractor should provide sample testing facilities like chemical lab, chemists and required accessories within the firm price of contract.
- 3.8 **Road permits / Other documents required for despatching their material has to be arranged by the party.**
- 3.9 On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and levelled and debris shall be removed, as per instructions of BHEL, by the contractor at his cost. In the event of his failure to do so, the Engineer will get it done and expenses incurred shall be recovered from the contractor along with prevailing overheads. The decision of BHEL Engineer in this regard shall be final.

Chapter - IV: T&Ps and MMEs to be deployed by Contractor

4.0 T&P AND MMD DEPLOYED BY CONTRACTOR

- 4.1 T&Ps and IMTEs (Inspection, Measuring & Testing Equipment), which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by contractor with in the finally accepted rate. In the event of the failure of contractor to bring necessary and sufficient T&Ps/ and IMTEs, BHEL will be at liberty to arrange the same at the risk and cost of contractor and hire charges as applicable shall be deducted from contractor's bill. Decision of BHEL in this regard shall be final and binding on contractor.
- 4.2 All distribution boards, connecting cables/ welding cables, wire ropes, hoses etc. including temporary air/ water/ electrical connections etc, shall have to be arranged by the contractor at his own cost.
- 4.3 Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection, measuring and Test equipment). The IMTEs shall have test/ calibration certificates from authorised/ Govt. approved/ accredited agencies traceable to National/ International standards. Each IMTE shall have a label indicating calibration status i.e. date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.
- 4.4 Re-testing/ re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer with in the contract period. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. Also if any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument. Failing which BHEL may deploy IMTEs and re-take the readings at contractor's cost.
- 4.5 Contractor to use his own T&P for the unloading, loading & transportation of the material.

S .NO.	Description	Qty.	Remarks
1.	Crane-100 MT	As per requirement	On Sharing basis

NOTES:

1. **Cl.4.2.2.16 c.) of SCC** shall read as day-today upkeep and running maintenance like filling topping up of lubricants, changing filters, etc including repair of self starter, batteries and dynamo of these cranes shall be the responsibility of the contractor. If on checking it is found that the same is not followed, BHEL will exercise its right to get the job/works done at the risk and cost of contractor. BHEL may also provided cranes through crane hiring agencies in which case the day-to-day upkeep and running maintenance shall be excluded from scope of contractor.
2. **Cl.4.2.2.16 e.) of SCC The operator for BHEL's cranes 100 MT & above capacity being provided by BHEL free of cost. Further, Helpers and fuel for operation of all BHEL cranes, shall be provided by contractor within the final accepted rates.**
3. Cranes will be provided on sharing basis on specific instruction of the BHEL Engineer as per the work requirement.
4. The contractor shall make necessary arrangement like lying of steel plates, assembly & dismantling of heavy lift attachment, boom, jib etc. for movement and operation of crane.

Chapter - VI: TIME SCHEDULE

6.0 TIME SCHEDULE

6.1 The contractor is required to commence the work within 15 days from the date of issue of LOI unless BHEL decides to fix any other later date. However, the actual date of start of work, to fix up the zero date of the contract, will be certified by BHEL Engineer after adequate mobilisation of manpower and T&Ps by the contractor.

6.2 Entire work as detailed in the tender specifications shall be completed within **08 months** from the date of start of work as per programme/schedule indicated by BHEL Engineer.

Preparatory works for Pre-Boiler flushing – 15 days approx.

Process Time for Pre-Boiler flushing, rinsing etc. – 5 days approx.

Preparatory works for Chemical cleaning – 20 days approx.

Process Time for Chemical cleaning, sample testing etc. - 5 days approx.

Aeration of effluent and their disposal-20 days approx..

Approx. time for completion for Unit #6

2 months

Time Gap

04 months

Approx. time for completion for Unit #7

2 months

NOTE:

The programme of works and time period for each unit is to be decided jointly along with BHEL Engineer/ Customer M/s UPRVUNL at site depending upon the work fronts availability.

In case, work under specifications not completed within the stipulated time period. The necessary time extension will be given as per GCC clause no.2.11.

6.3 The work under the scope of this contract is deemed to be complete in all respects, only when the contractor has discharged all the responsibilities laid down in the contract. The decision of BHEL on completion date shall be final and binding on the contractor

Chapter - VII: TERMS OF PAYMENT

7.0 TERMS OF PAYMENT

- 7.1 The 'Engineer' will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book.
- 7.2 Contractor shall submit bills for the work completed under the specification detailing work done. The format for billing shall be approved by BHEL before raising invoices.
- 7.3 Subject to any deduction which BHEL may be authorised to make under the contract, the contractor on the certificate of the Engineer at site is entitled for payment as explained hereunder:

7.3.1 THE PAYMENT FOR EACH OF THE UNIT AWARDED VALUE SHALL BE RELEASED AS PER FOLLOWING;

A. For Item No. 1

- I 35% of the Contract Value (CV) shall be payable on successful completion of chemical cleaning using EDTA of Unit No. 6 as certified by BHEL Engineer.
- II. 12.5% of Contract Value shall be payable on successful completion of alkali flushing of Unit No. 6 as certified by BHEL Engineer.
- III. 35% of the Contract Value shall be payable on successful completion of chemical cleaning using EDTA of Unit No. 7 as certified by BHEL Engineer.
- II. 12.5% of Contract Value shall be payable on successful completion of alkali flushing of Unit No. 7 as certified by BHEL Engineer.

B. Balance 5% of the contract value shall be payable as under;

- i) 2.5% of the above value shall be payable on completion of all pending work, reconciliation of material wherever required, area cleaning etc.
- ii) The balance 2.5% of the above value shall be payable after 3 months on contractors discharging his responsibilities as stipulated in this contract and on passing of final bill. The SD amount, if any, deducted by the BHEL Site from the contractor's RA bills, shall be released along with this final payment.

Note: Above payment shall be released after adjustment of the contract value based on actual work carried out.

- C. No separate payment shall be made for any temporary structures, lifting arrangements for testing and other NDT etc., as all these activities shall be performed as integral to erection work as per site requirement and as directed by Engineer.

Chapter - VIII: TAXES, DUTIES, LEVIES

8.0 TAXES, DUTIES, LEVIES

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

However, provisions regarding **Service Tax and Value Added Tax (VAT)** on output services and goods shall be as per following clauses.

8.1 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be exclusive of Service Tax and Cess on Output Services.

Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. The Service Tax Rules permit more than one option or methodology for discharging the liability of tax/levy/duty and BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the

Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. For the purpose of claiming any Service Tax from BHEL, the following procedure shall be adopted :

Contractor shall submit serially numbered Service Tax and Cess Invoices, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely:

1. The name, address and registration number of the contractor
2. The name and address of the party receiving taxable service (BHEL)
3. Description, classification and value of taxable service provided and
4. The Service Tax payable thereon.

All the four conditions shall be fulfilled in the invoice for payment of Service Tax by BHEL.

Where more than one nature of Service under Service Tax Rules is involved, the invoice mentioned above shall contain the break up of all values for each nature of Service.

8.2 VAT (Sales Tax /WCT)

The rates quoted by the Contractor shall be inclusive of VAT/Sales Tax and BHEL shall not reimburse any amount on this account due to any reason whatsoever.

The Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill.

Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted.

In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax/VAT Authorities, for bringing all their material, plant and equipment etc at site for the execution of the work, including arrangement of Road Permits if and as applicable under the relevant VAT Act.

8.3 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the contractor.

8.4 New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

Chapter - IX: Others

9.0 OTHERS

9.1 For reverse auction/ for Price Bid opening, only those bidders will be considered who will be qualified for the subject job on the basis of pre-qualification evaluation/ Techno-commercial bids. BHEL reserves the right to reject the bidders with unsatisfactory past performance in the execution of a contract. BHEL's decision in this regard shall be final & binding.

9.2 OVER RUN

9.2.1 Overrun clause no. 2.12 given in GCC shall not applicable for this contract.

9.3 Interest bearing advance

9.3.1 Interest bearing advance Clause no. 2.13 given in GCC shall not applicable for this contract.

9.4 PRICE VARIATION

9.4.1 Price variation Clause no. 2.17 given in GCC not applicable for this contract.

Chapter - X: ANNEXURES

ANNEXURE- I

**List of BHEL supplied Temporary Piping Material for Pre-boiler
flushing and Chemical Cleaning of Boiler using EDTA at 2X500 MW
Anpara D TPS**

Description	Unit	Qty.
PIPE OD219.1X8.18:	M	126
PIPE OD168.3X7.11	M	155
PIPE OD273X9.27	M	450
PIPE OD48.3X5.08	M	331
PIPE OD114.3X6.02	M	94
PIPE OD88.9X5.49	M	125
PIPE OD273.1X6.40	M	300
BW LR 90DEG ELL219.1X8.18	NOS	5
BW LR 90DEG ELL88.9X5.49	NOS	20
ELBOW 90 DEG.273X9.27 SA	NOS	21
BW LR 90DEG ELL114.3X6.02	NOS	15
TEE UNEQUAL 234WPB	NOS	8
TEE EQ. OD 114.3X6.02 SA 234WPB	NOS	6
BW EQT 273X9.27	NOS	8
BW UEQT 273X9.27	NOS	1
BW CON RED 323.9X9.53/273X9.27	NOS	1
BW CON RED 168.3X7.11/114.3X6.02	NOS	5
BW CON RED 273X9.27/219.1X8.18	NOS	14
PIPE OD21.3X3.73 EPAT SITE,D1=14.5	M	26
TEE UNEQUAL 234WPB	NOS	1
TEE EQ. OD 114.3X6.02 SA 234WPB	NOS	1
BW UEQT 323.9X9.53/ 168.3X7.11	NOS	1
BW UEQT 273.1X9.27 168.3X7.11	NOS	1
BW UEQT 273X9.27/ 114.3X6.02	NOS	1
BW Conc. Reducer 219.1x8.18/168.3x7.11sa234wpb	NOS	14
30 SW REDG. COUPLING NB 25/15 30000 SA 105	NOS	6
SW STUB NB15 CL.3000 (CS)	NOS	12
SW STUB NB40 CL.3000 (CS)	NOS	4

Note: Any additional material required (excluding material indicated in the Annexure-III) for completion of the chemical cleaning will be provided by the BHEL as free of cost.

Bill of Material of MS Tanks to be fabricated by Contractor at site

1) 60M³: size – 3m height x4m breadth x5m length .

Require materials:

1500mm breadth x 10mm thick – 36meters MS Plates.

2000mm breadth x 12mm thick – 10meters MS Plates.

Or

1000mm breadth x 10mmthick – 20meters MS Plates.

2000mmbreadth x 3mmthick – 10meters MS Plates.

Or

1000mmbreadth x 3mmthick – 20meters. MS Plates.

Channel 125mm -140meters approximately.

Angle 65mm-20meters.

2) 50M³: size – 2.5m height x4m breadth x5m length.

Require materials:

1250mm breadth x 10mm thick – 36meters. MS Plates.

2000mm breadth x 12mm thick – 10meters. MS Plates.

Or

1000mmbreadth x 10mmthick – 20meters. MS Plates.

2000mmbreadth x 3mmthick – 10meters. MS Plates.

Or

1000mmbreadth x 3mmthick – 20meters. MS Plates.

Channel 125mm -140meters approximately.

Angle 65mm-20meters.

Note:

All the material like MS plates, Channel, angle to be provided by BHEL as free issue item.

Tentative List of Temporary Piping Material & IMTEs for Pre-boiler flushing and Chemical Cleaning of Boiler using EDTA at 2X500 MW Anpara D TPS in Contractor Scope

Material (C/S)	Size	Qty.	TYPe
VALVE Hand Operated, Butt welded / Socket welded	Nb 200	09 Nos	Gate, 300 Class
	Nb 150	01 No	Gate, 800 Class
	Nb 150	04 Nos	Gate, 300 Class
	Nb 100	06 Nos	Gate, 300 Class
	Nb 150	03 Nos	NRV, 300 Class
	Nb 50	10 Nos	Globe, 300 Class
	Nb 50	02 Nos	NRV, 300 Class
	Nb 40	08 Nos	Globe, 300 Class
	Nb 25	15 Nos	Globe, 300 Class
	Nb 15	10 Nos	Globe, 300 Class

Pump, 200 Cu M / Hr , 20 Kg / cm² with strainer, base frame and spares alongwith suitable drive Motor with starter , ammeter, cable etc. with MCC and distribution board 03 Sets

Power Cable from source to distribution board 150 Meters or APR

Pump , 20 Cu M / Hr, 05 Kg/ cm² alongwith suitable drive Motor with starter , ammeter, cable etc. with MCC and distribution board 02 Sets

PVC Hose Pipe, 50 mm dia approx. 50 Meter

Sample Coolers 05 Nos.

Welding electrodes sufficient quantity

Instruments (IMTEs) :

Pressure Gauge, 0 - 25 Kg / cm² 05 Nos

Pressure Gauge, 0 - 06 Kg / cm² 03 Nos

Condensing Loop 08 Nos

Thermometer , 0 – 100 Deg. C 02 Nos

Peening Type MTM Thermocouples (K type) with pad and compensating cable upto control room 10 Nos

Thermocouple (K type), 1500 mm long with compensating cable upto control room 02 Nos

Drum gauge glass, range 900 mm long 02 Nos.

Temporary Drum level indication at Control Room & near pump alongwith cable from drum floor 02 Nos

Safety Appliances as indicated

Laboratory testing equipment & reagents

Chapter - XI: UNPRICED RATE SCHEDULE

Item No.	DESCRIPTION OF WORK	QTY.	Unit Rate (In ₹)	Total Amount (In ₹)
1	Lumpsum price for carrying out Pre-boiler flushing & Chemical cleaning of Boilers Unit No.6 & 7 at 2x500 MW Anpara D TPS.(For two units) as per tender specifications.	Lump sum	/	/
TOTAL CONTRACT VALUE(INR)				

NOTES:

- 1 The quantities indicated in above are tentative and are liable to vary depending upon the site requirement. The contractor has to handle / erect / commission all the items indicated by BHEL for achieving the milestones and completion of work.
- 2 Evaluation of bids shall be done on total price against this Rate Schedule / BOQ.
- 3 In case of any mismatch in Rate and amount on Price discrepancy, the same will be dealt as per clause No. 1.4 of GCC.

(Signature, date & seal of authorized representative of the bidder)

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