

1578504/2023/PS-PEM-MAX



POWER SECTOR-PEM NODA  
TECHNICAL PRE-QUALIFICATION REQUIREMENTS  
FOR OPEN/GLOBAL TENDERS  
3X660 MW NTPC NORTH KARANPURA STPP

PACKAGE: AUXILIARY COOLING WATER (ACW) TREATMENT PROGRAM FOR FGD	
DEPARTMENT	: MECHANICAL AUXILIARY
REVISION	: 00
DATE	: 12.07.2023
PAGE	: 1 of 1

The Bidder should have executed contracts for cooling water treatment programme of at least one (1) cooling water system having a flow rate not less than 100 Cu.M/hr and the treatment programs should have been in successful operation for at least one year. These contracts should include supply of chemicals, operation and maintenance of the system.

#### NOTES:-

For establishing above, the supplier has to submit the following supporting documents:

- Copy of performance certificate from end user specifying that the product is running successfully for minimum specified period as indicated above.
- Bidder shall submit supporting documents to substantiate technical parameters specified in PQR, if the same is not mentioned in performance certificate.
- In case documents submitted for meeting PQR are in language other than English, notarized English translation shall also be submitted by bidder.
- Notwithstanding anything stated above, BHEL & NTPC reserves the right to assess the capabilities and capacity of the Bidder to perform the contract.
- Final acceptance of the Bidder is subject to End customer's approval.



TITLE: TECHNICAL SPECIFICATION FOR  
AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.  
PROJECT: 3X660 MW NTPC NORTH KARANPURA STPP  
(FGD SYSTEM PACKAGE).

BHEL DOCUMENTS NO.: PE-TS-441-156-A001

REV NO: 00

DATE: 12-Jul-23

# TECHNICAL SPECIFICATION FOR AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.

**SPECIFICATION NO.: PE-TS-441-156-A001**



**BHARAT HEAVY ELECTRICALS LIMITED**  
POWER SECTOR  
PROJECT ENGINEERING MANAGEMENT  
NOIDA

1578493/2023/PS-PEM-MAX



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## SECTION - A

## INTENT OF SPECIFICATION

	<b>TITLE:</b> <b>TECHNICAL SPECIFICATION FOR</b> <b>AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.</b> <b>PROJECT: 3X660 MW NTPC NORTH KARANPURA STPP</b> <b>(FGD SYSTEM PACKAGE).</b>	BHEL DOCUMENTS NO.: PE-TS-441-156-A001	
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## 1.0 SCOPE OF INQUIRY/ INTENT OF SPECIFICATION:

This specification is intended to cover design, engineering, manufacture, supply, fabrication, assembly, inspection/ testing at vendor's & sub-vendor's works, maintenance/ special tools & tackles, start up and commissioning spares as required, forwarding, proper packing, shipment and delivery at site, unloading, handling, transportation & storage at site, in site transportation, assembly, chemicals for one year operation, commissioning, preparation and submission of drawing/ documents including "As Built" drawings, carrying out Demonstration tests at site and equipment/ system guarantee, O&M for one year etc. inclusive of all prevailing taxes, duties and other levies and handover in flawless condition of the package ACW TREATMENT SYSTEM to the end customer complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification for 3X660 MW NTPC NORTH KARANPURA STPP (FGD SYSTEM PACKAGE).

1.1 The contractor shall be responsible for providing all material, equipment & services, which are required to fulfil the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under this specification, irrespective of whether it has been specifically listed herein or not. Omission of specific reference to any component / accessory necessary for proper performance of the equipment shall not relieve them of the responsibility of providing such facilities to complete the supply and commissioning of **ACW Chemical treatment programme.**

1.2 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which in his judgment is not in full accordance herewith.

1.3 The extent of supply under the contract includes all items shown in the drawings, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly, the extent of supply also includes all items mentioned in the specification and /or schedules, notwithstanding the fact that such items may have been omitted in the drawing.


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

1.5 The general terms and conditions, instructions to tenderer and other attachment referred to elsewhere are made part of the tender specification. The equipment materials and works covered by this specification are subject to compliance to all attachments referred to in the specification. The bidder shall be responsible for and governed by all requirements stipulated herein.

1.6 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information, ensure completeness of specification, to bring out any contradictory / conflicting requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol-III of the specification. In absence of any such clarifications, in case of any contradictory requirement, the more stringent requirement as per interpretation of BHEL/Customer shall prevail and shall be complied by the bidder without any commercial and delivery implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by BHEL/ Customer as and when brought to their notice either by the bidder or by BHEL/ customer themselves. However, such requirements shall be binding on the successful bidder without any commercial & delivery implication.

1.7 Deviations, if any, should be very clearly brought out clause by clause along with cost of withdrawal in the enclosed schedule (in Vol – III); otherwise, it will be presumed that the vendor's offer is strictly in line with

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NIT specification. If no cost of withdrawal is given against the deviation, it will be presumed that deviation can be withdrawn without any cost to BHEL/its customer.

1.8 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.

1.9 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder/vendor and Customer/Purchaser/Employer will mean BHEL and/or Customer (NTPC: National Thermal Power Corporation Limited) as interpreted by BHEL in the relevant context. Please refer GCC/SCC for better clarity.

1.10 The equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and dispatch release issued by BHEL/Customer.

1.12 Pre-bid meeting shall be held before bid submission. Bidder to ask all their queries in Prebid clarifications format only.

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## SECTION – B

### PROJECT INFORMATION

	<b>TITLE:</b> <b>TECHNICAL SPECIFICATION FOR</b> <b>AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.</b> <b>PROJECT: 3X660 MW NTPC NORTH KARANPURA STPP</b> <b>(FGD SYSTEM PACKAGE).</b>	BHEL DOCUMENTS NO.: PE-TS-441-156-A001	
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1.00.00	<b>BACKGROUND</b>  <p>North Karanpura Super Thermal Power Project (3x660 MW), a pit head coal based thermal power project, is located in Hazaribagh and Chatra districts of Jharkhand State. Basic inputs i.e. coal, water and land have already been tied up. The project is proposed for the States &amp; Union Territories of Northern, Western and Eastern Regions and the State of Jharkhand.</p> <p>The capacity of the project is 1980 MW comprising of three (3) units of 660 MW each.</p>								
1.01.00	<b>Location and Approach</b>  <p>The power project is proposed to be located near Tandwa town in Chatra districts in the state of Jharkhand on Hazaribagh-Chatra State highway at a distance of about 50 kms from Hazaribagh city. The nearest commercial airport is Ranchi at a distance of 100 kms from project site. The nearest railhead Khalari Railway Station on Ranchi-Garhwa section of Eastern Railways is about 25 kms from project site.</p> <p>Major rail/road distances from the project site are as under:</p> <table> <tr> <td><b>City</b></td><td><b>Distance Approx.</b></td></tr> <tr> <td><b>(kms)</b></td><td></td></tr> <tr> <td>Ranchi</td><td>: 80</td></tr> <tr> <td>Khalari</td><td>: 25</td></tr> </table> <p>The site is located near Tandwa town having latitude and longitude of about 23° 50' N to 23° 52' N and 84° 59' E to 85° 2' E respectively. The Vicinity Plan of the project is placed at <b>Annexure-I</b>.</p> <p>Further to the information given in this sub-section, Bidders are also advised to visit the project site and collect data on local site conditions.</p>	<b>City</b>	<b>Distance Approx.</b>	<b>(kms)</b>		Ranchi	: 80	Khalari	: 25
<b>City</b>	<b>Distance Approx.</b>								
<b>(kms)</b>									
Ranchi	: 80								
Khalari	: 25								
1.02.00	<b>Land</b> <p>The plant layout was readjusted and total land requirement was reduced from 2330 acres to about 970 acres. Out of 2277 acres of land the plant, ash dyke and transit camp is being suitably adjusted. No additional land is envisaged to be acquired in plant area. About 15 acres of land is envisaged to be acquired in Hazaribagh city for Township. Commissioner, Chatra vide dated 25.05.1999 and 14.06.2000 has given in-principle clearance for NKSTPP.</p>								
1.03.00	<b>Water</b> <p>Make up water requirement for this project would be about 20 cusec. Make up water requirement shall be met by raw water reservoir. Intake water pumps shall pump water to reservoir during the rainy season only from Garhi barrage.</p>								
1.04.00	<b>Fuel (Coal)</b>								
1.04.01	<b>Coal Requirement, Availability and Linkage</b> <p>Coal requirement for the project is estimated as 10.60 Million Tonne/Annum (MTPA), considering a GCV of 3800 kcal/kg. Ministry of Coal vide letter dated 21.10.99 accorded in-principle coal linkage of 10.00 MTPA subject to ratification by Standing Linkage Committee-Long Term (SLC (LT)), of MOC. SLC (LT) in its meeting held on 15.12.2000 firmed up the coal linkage of 10.24 MTPA for the project. Subsequently, the coal linkage was withdrawn by SLC (LT) in its meeting held on 22/23.10.08.</p> <p>Cabinet Committee on Investment (GOI) in its meeting on 20.02.13 decided in-principle to restore the original coal linkage granted to NKSTPP (i.e. from Magadh Coal Block) with the stipulation that the coal supply will commence during the 13th Five Year Plan. Ministry of Power has already taken up the matter of coal linkage restoration with Ministry of Coal videdated 12.04.2013.</p>								



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1.04.00	<b>Coal Transportation</b> Coal from Magadh block of North Karanpura Coalfields is proposed to be transported to the project site through conveyor belt system. Parallel double stream Conventional troughed conveyors of 3000 MTPH rated capacity are envisaged for external coal handling plant. It is proposed to have one internal coal handling plant of 3000 MTPH rated capacity.
1.05.00	<b>Meteorological Data</b> Important meteorological data from nearest observatory at Hazaribag is placed at Annexure- II.
1.06.00	<b>Plant Water Scheme</b> The Plant water scheme is described below.
1.06.01	<b>Equipment Cooling Water (ECW) System (Unit Auxiliaries)</b> All plant auxiliaries shall be cooled by De-mineralized water (DM) in a closed circuit. The primary circuit DM water shall be cooled through heat exchangers by Circulating Water tapped from CW system in a closed secondary circuit. The hot secondary circuit cooling water shall be cooled in the cooling towers and shall be returned back to the system.
1.06.02	<b>Ash Water System</b> It is proposed to have HCSD (High concentration Slurry Disposal) system for combined fly ash and bottom ash. No recirculation of ash water from ash disposal area is envisaged.
1.06.03	<b>Other Miscellaneous Water Systems</b> <ol style="list-style-type: none"> <li>The service water shall be taken from clarified water tank of Pretreatment plant. Service water (wash water) collected from various areas shall be treated using oil water separators, tube settlers, coal settling pits etc. as per requirement and treated water from liquid effluent treatment plant shall be recycled back to the service water system for re-use.</li> <li>The drinking water requirement of the plant shall be provided from water treatment plant.</li> <li>Steam Cycle make-up water, makeup to the primary circuit of ECW (unit auxiliaries) system, boiler fill water and makeup to the hydrogen generation plant shall be provided from Demineralising plant.</li> <li>The quality of Raw water is enclosed with this sub-section as Annexure-III.</li> </ol>

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## SECTION – C SPECIFIC TECHNICAL REQUIREMENT

	<b>TITLE:</b> <b>TECHNICAL SPECIFICATION FOR</b> <b>AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.</b> <b>PROJECT: 3X660 MW NTPC NORTH KARANPURA STPP</b> <b>(FGD SYSTEM PACKAGE).</b>	BHEL DOCUMENTS NO.: PE-TS-441-156-A001	
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## 1.0 GENERAL

This specification is intended to cover design, engineering, manufacture, supply, fabrication, assembly, inspection/ testing at vendor's & sub-vendor's works, maintenance/ special tools & tackles, start up and commissioning spares as required, forwarding, proper packing, shipment and delivery at site, unloading, handling, transportation & storage at site, in site transportation, assembly, chemicals for one year operation, Commissioning, preparation and submission of drawing/ documents including "As Built" drawings, carrying out Demonstration tests at site and equipment/ system guarantee, O&M for one year etc. inclusive of all prevailing taxes, duties and other levies and handover in flawless condition of the package **ACW TREATMENT SYSTEM** to the end customer complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification for **3X660 MW NTPC NORTH KARANPURA STPP (FGD SYSTEM PACKAGE)**.

## 2.0 SCOPE OF SUPPLY (MECHANICAL)

Broad scope of supply (mechanical) for this package is detailed below and as indicated in relevant portion of this specification.


The ACW Treatment Plant, as specified in technical specification, and shall consist of at least the followings:

- 2.1 Supply of all ACWT specialty chemicals for One (1) year operation along with necessary test coupons.
- 2.2 Operation & Maintenance for complete ACW Chemical Treatment System for One (1) year operation.
- 2.3 Six (6) Nos. Electronic barrel pump (1 Bar pressure) shall be provided to dose the chemicals with 100 m flexible tubing by bidder. MOC for pumps (Housing (wetted parts) - PP and for Diaphragm - PTFE).

## SCOPE OF SERVICES

The bidder's scope also includes following services for scope under this specification:

- 3.1 Unloading (including all chemicals in scope of supply), Storage, handling and transportation at site.
- 3.2 Pre-commissioning work such as flushing, hydraulic testing etc. Necessary consumables and instrumentation as required for inspection and testing at works as well as at site including pre-commissioning activities shall be arranged by the successful bidder at their own cost.
- 3.3 Commissioning of entire ACW treatment plant.
- 3.4 The complete Operation & Maintenance of ACW TREATMENT PLANT for One (1) year is in bidder's scope. Start date of O&M shall be intimated separately by BHEL site.

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## 1.0 Design parameters of Cooling tower:

### Basic design parameters of ACW Circuit for Cooling Tower

- Process/Mechanical

Process/Mechanical Properties	Units	value
Recirculation Rate	m <sup>3</sup> /hr	315
Cooling tower Basin Volume	m <sup>3</sup>	50
Evaporation plus Drift loss in Cooling Tower	m <sup>3</sup> /hr	7
Blow Down	m <sup>3</sup> /hr	3
Make Up Rate (Normal)	m <sup>3</sup> /hr	10

- Operational

Operational Properties	Units	value
Cold Water Temperature	°C	33
Hot Water Temperature	°C	38
MOC for ACW Piping	Carbon Steel.	
Operation	Continuous	
Operating Days/Years	Days	365

## 2.0 DESIGN AND CONSTRUCTION REQUIREMENTS OF “AUXILIARY COOLING WATER TREATMENT PLANT” (ACWTP):

ACWTP system is envisaged in circulating cooling water in order to control corrosion, scale formation & biological growth. Bidder shall design suitable ACWTP for the Cooling Tower for start-up passivation and normal chemical dosing. Bidder shall consider monitoring and control ACWTP system to maintain seamless operation.

## 3.0 GENERAL REQUIREMENT OF AUXILIARY COOLING WATER DOSING SYSTEM:

Bidder to quote for proper chemical dosing for ACW circuit considering system metallurgy as carbon steel to control Scale, Corrosion and Biological Growth.

Bidder shall study the scheme, water analysis etc contained in the specification and offer/supply the most suitable chemical(s). The chemicals proposed shall be non-toxic type. Heavy metal-based chemicals such as chromate, zinc etc are not applicable. Further the chemicals shall not have any deleterious effect on any component of the ACW System. Organic polymer / organic phosphorous / organic phosphates-based chemicals shall be used. Required documentation in support of the above shall be made available to customer if required. The products offered should be field tested and proven.

Bidder should offer ACWTP, which is well proven in other industries with similar kind of circulation rate, technically proven & suitable to this plant in terms of metallurgy, environment, safety norms and consent conditions.

## 4.0 ACW MAKE UP WATER ANALYSIS:



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SL NO.	CONSTITUENT	AS	PARAMETERS (RAW WATER)	PARAMETERS (CLARIFIED WATER)
1	CALCIUM	PPM As CaCO <sub>3</sub>	65	118.7
2	MAGNESIUM	PPM As CaCO <sub>3</sub>	41	41
3	SODIUM & POTASSIUM	PPM As CaCO <sub>3</sub>	103 (98+5)	103 (98+5)
4	TOTAL CATIONS	PPM As CaCO <sub>3</sub>	209	262.7
5	TOTAL-ALKALINITY	PPM As CaCO <sub>3</sub>	150	165.2
6	CHLORIDE	PPM As CaCO <sub>3</sub>	25	32
7	SULPHATE	PPM As CaCO <sub>3</sub>	34	65.5
8	TOTAL ANIONS	PPM As CaCO <sub>3</sub>	209	262.7
9	REACTIVE SILICA	PPM As SiO <sub>2</sub>	9	9
10	IRON	PPM As Fe	0.3	0.3
11	pH	---	7.6-8.2	7.6-8.2
12	TUBIDITY	NTU	200	2
13	ORGANIC MATTER	PPM	0.05	0.05
14	TOTAL DISSOLVED SOLIDS	PPM	318	372
15	TEMPERATURE	DEG C	20-35	20-35
16	TOTAL SUSPENDED SOLIDS	PPM	10	10

Note-1: Clarified water is being used as cooling water make up. Other parameters of Cooling Water has been derived w.r.t continuous dosing of Alum as Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> -70ppm, Lime as Ca(OH)<sub>2</sub> -30 ppm, Coagulant aid - 2ppm and Gas Chlorine-5 ppm in Raw Water.

**Note: One number single phase power connection shall be provided (by BHEL) at 5 meters from ACW treatment system for further use by Treatment Program Supplier.**

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VOLUME III

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### SCHEDULE OF PRE-BID CLARIFICATION

All clarification from the Technical Specification shall be filled in by the BIDDER clause by clause in this format only.

VOLUME	SECTION	CLAUSE NO.	PAGE NO.	SPECIFICATION REQUIREMENT	CLARIFICATION	REASONS FOR CLARIFICATION

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### SCHEDULE OF DEVIATION WITH COST OF WITHDRAWAL

#### SCHEDULE OF DEVIATION WITH COST OF WITHDRAWAL

#### TENDER ENQUIRY REFERENCE:-

#### NAME OF BIDDER:-

S L N O	VOUL ME/ SECTI ON	PA GE NO.	CLAU SE NO.	TECHNICAL SPECIFICA TION/ TENDER DOCUMENT	COMPLET E DESCRIP TION OF DEVIATIO N	COST OF WITHDRAWAL OF DEVIATION	REFERE NCE OF PRICE SCHEDU LE ON WHICH COST OF WITHDR AWL OF DEVIATI ON IS APPLICA BLE	NATURE OF COST OF WITHDR AWL OF DEVIATI ON (POSITIV E/ NEGATIV E)	REASO N FOR QUOTIN G DEVIAT ION
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#### TECHNICAL DEVIATIONS


#### COMMERCIAL DEVIATIONS


#### PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE


NAME	DESIGNATIONS	SIGN & DATE	

#### NOTES:

1. Cost of withdrawal of deviation will be applicable on the basic price (i.e, excluding taxes, duties & freight) only.
2. All the bidders has to list out all their Technical and Commercial Deviations (if any) in detail in the above format.
3. Any deviation not mentioned above and shown separately of found hidden in offer, will not be taken cognizance of.



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4. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable. in the absence of same, such deviation(s) shall not be considered and offer shall be considered in total compliance to NIT

5. Bidder shall furnish price copy of above format along with price bid.

6. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.

7. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.

8. For deviations w.r.t. Credit Period, Liquidated damages, Firm prices if a bidder chooses not to give any cost of withdrawal of deviation loading as per **GCC (General Condition of Contract)** will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.


9. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.

10. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in un-priced copy of this format.

11. Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.

12. In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.

13. In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.


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### COMPLIANCE CUM CONFIRMATION SCHEDULE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate and furnishing same with the offer:

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions/ deviations with regard to same.
- b) QP/ test procedures shall be submitted in the event of order based on the guidelines given in the specification & QP enclosed therein (as applicable). QP will be subject to BHEL/Customer approval in the event of order & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. The charges for 3rd party inspection (Lloyds, TUV or equivalent ) for imported components shall be included in the base price of the equipment by the bidder
- c) All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/Customer review/ approval. GA drawings, as submitted with offer at tender stage are for reference purpose only and shall be subject to approval during contract stage.
- d) There are no other deviations with respect to specification other than those furnished in the 'Schedule of Deviations'
- e) The offered materials shall be either equivalent or superior to those specified. Also for components where material is not specified it shall be suitable for intended duty, materials shall be subject to approval in the event of order.
- f) The commissioning spares (if any) are supplied on 'As Required Basis' & prices for same included in the base price (If bidders reply to this is "No commissioning spares are required" and if some spares are actually required during commissioning same shall be supplied by bidder without any cost to BHEL).
- g) All sub vendors shall be subject to BHEL/CUSTOMER approval
- h) Any special tools & tackles, if required, shall be in bidder's scope.
- i) Demonstration parameters shall stand valid till the satisfactory completion of demonstration test and its acceptance by BHEL/Customer.

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	TITLE:	BHEL DOCUMENTS NO.: PE-TS-441-156-A001	
	TECHNICAL SPECIFICATION FOR		
	AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.		
	PROJECT: 3X660 MW NTPC NORTH KARANPURA STPP (FGD SYSTEM PACKAGE).	REV NO: 00	DATE: 12-Jul-23

\* Bidder shall include this schedule both in technical and Price offers

### DECLARATION

I .....certify that all the technical data and information pertaining to this specification are correct and are true representation of the equipment/system covered by our format proposal number Dated ..... and there is no deviation to the specification (except indicated in the deviation sheet (cost of withdrawal).

I hereby certify that I am duly authorized representative of the Bidder's company whose name appears above my signature.

Biders Company Name .....

Authorised representative's  
Signature .....

Name .....

Bider's Name with The bidder hereby agrees to fully comply  
the requirements and intent of this  
specification for the price indicated

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

1578493/2023/PS-PEM-MAX



TITLE:

**TECHNICAL SPECIFICATION FOR  
AUXILIARY COOLING WATER (ACW) CHEMICAL TREATMENT.  
PROJECT: 3X660 MW NTPC NORTH KARANPURA STPP  
(FGD SYSTEM PACKAGE).**

BHEL DOCUMENTS NO.: PE-TS-441-156-A001

REV NO: 00

DATE: 12-Jul-23

### DRAWING DOCUMENTS/SUBMISSION SCHEDULE

- PE-V0-441-156-A001 - Schematic drawing for ACW treatment Program: Document is to be submitted within 2-week form receipt of LOI.
- PE-V0-441-156-A002 - Operation philosophy for ACW treatment system. Document is to be submitted within 2-week form receipt of LOI.