



TD 106-1 Rev No. 6	Form No.		BHARAT HEAVY ELECTRICALS LIMITED PULVERISERS, HPEP HYDERABAD		Product STD NO.	BA89251
			TECHNICAL SPECIFICATION FOR MILL CIRCUIT TANK FOR NTPC RAMAGUNDAM		Rev. No. 00	
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***TECHNICAL SPECIFICATION FOR
MILL CIRCUIT TANK FOR NTPC
RAMAGUNDAM.***

Refer Doc			PREPARED	CHECKED	APPROVED	Date of 1st Issue:
			UDAY REDDY	PVS	AMAN	23.09.2022

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1. PROJECT INFORMATION

NTPC RAMAGUNDAM (RSTPS) is a plant set up by NTPC. The station is located in the Peddapalli district of the Indian state of Telangana. about 60 kms from Karimnagar town and 100 kms from Warangal. Ramagundam Railway station is on the Delhi - Chennai main line. Ramagundam is well connected to Hyderabad by Rajiv Rahadari state highway. The aerial distance from Ramagundam to Hyderabad is 178 km while the road distance between Ramagundam to Hyderabad is 209 km and by train it is 224 Km. Nearest commercial airport is Rajiv Gandhi International Airport, Hyderabad at about 250 km

a)	Owner	NTPC RAMAGUNDAM (RSTPS)
b)	Buyer	BHEL, Hyderabad
c)	Process/Application	Flue Gas Desulphurization

A) SITE CONDITIONS

Barometric Pressure

	Barometric Pressure		
	Minimum	Reference	Maximum
Observational Record hPa			
Design Value Outdoor hPa		995.38	

Ambient Temperature

	Ambient Temperature		
	Minimum	Reference	Maximum
Observational Record Deg C			
Design Value Outdoor Deg C	27		45
Design Value Indoor Deg C			

Relative Humidity

	Humidity		
	Minimum	Reference	Maximum
Observational Record %			
Design Value Outdoor %		60	
Design Value Indoor %			

Note:

- 1) Equipment and Material must be suitable for the range of ambient site conditions

B) PROJECT LOCATION

- a. Country: India.
- b. State/Division: Telangana.
- c. District: Peddapalli.



2. GENERAL DESCRIPTION OF MILL CIRCUIT TANK

The Mill Circuit tank is provided to hold and dilute the circulating slurry of the mill circuit for desired operation of the Ball mill for limestone grinding.


S. No.	Description	Requirement
1	Quantity	
	Number of Circuit tanks	02
2	Parameters	
	Tank Details	PLEASE REFER ANNEXURE - 1 FOR TANK DRAWING
	Media to be Handled	Limestone Slurry
	Limestone and process water Analysis	ANNEXURE - 3
	Type of Agitator	Vertical mounted type.
	Duty	Continuous
	Application	Tank placed outdoor.

3. APPLICABLE CODES & REGULATIONS

The design and materials shall conform to the requirements of applicable codes and regulations of the latest edition (as applicable as on date of bid opening). The design, manufacturing, installation and testing of the agitator shall follow the latest applicable Indian/International (ISO/ASTM/AISI/ASME/EN/Japanese) Standards. If any other country standard used shall also be accepted subjected to approval by NTPC, in such case bidder shall furnish adequate information to justify that these standards are equivalent or superior to the international standard mentioned above. A copy of such standard duly translated (complete word to word translation) in English shall be furnished by vendor.

4. INTENT OF SPECIFICATION


- 4.1. The specification covers Supply part comprising of design (i.e. Preparation and submission of drawing /documents including "As Built" drawings), engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting consumables till handing over, commissioning spares for erection, start-up and commissioning, forwarding, proper packing, shipment and delivery at site.
- 4.2. 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.
- 4.3. It is not the intent to specify herein all the details of design and manufacture. However, the equipment / system shall conform in all respects to high standards of design, engineering and

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- 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 judgement is not in full accordance herewith.
- 4.4. The extent of supply under the contract includes all items mentioned in the specification and /or schedules. Similarly, the extent of supply also includes all items required for completion of the system for its safe, efficient, reliable and trouble free operation.
- 4.5. 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.
- 4.6. The general terms and conditions, instructions to tenderer and other attachment referred to elsewhere are hereby made part of the tender specifications. The equipment / material and works covered by this specification is subject to compliance to all the attachments referred in the specification. The tenderer shall be responsible for adherence to all requirements stipulated herein.
- 4.7. This specification covers the general design, selection of rubber materials, construction features, manufacture, shop inspection, testing at manufacturer's works (As per latest applicable statutes, regulation and safety codes in the locality where the lining are to be carried out) and delivery at site, surface preparation of lining surfaces, lining the surfaces to the satisfaction of the customer.
- 4.8. The rubber lining shall conform to the latest applicable Indian/British/American Standards. Nothing in this specification shall construe to relieve the contractor of the required statutory responsibility.
- 4.9. Compliance to this specification shall not relieve the vendor of the responsibility of furnishing Rubber lining materials of proper design, materials and workmanship to meet the specified requirements.
- 4.10. 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.
- 4.11. BHEL's Customer's representative shall be given full access to the shop in which the equipment's are being manufactured or tested and all test records shall be made available to him.
- 4.12. Various codes and standards to be used shall be as indicated in various parts of the specification. In case bidder uses any standard other than those indicated in the specification, the onus of establishing equivalence of the same with the specified standards will rest with the bidder and acceptance of the same shall be sole prerogative of customer. The bidder will also arrange for BHEL a copy of the standards in ENGLISH language. The cost of such service

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will be deemed to have been included by the bidder in the total cost of the package. BHEL will not entertain any additional cost on account of the same.

- 4.13. In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.
- 4.14. 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 as interpreted by BHEL in the relevant context. Please refer GCC/SCC for better clarity
- 4.15. All text/ numeric in the document / drawings to be generated by the successful bidder will be in English language only.
- 4.16. The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions. In case of deviation, it shall be listed in the vendor's proposal under separate section titled as "list of deviations/exceptions to the enquiry documents.

5. PROVENNESS CRITERIA:

The Bidders are required to meet the Qualification Requirement (QR) for as per enclosed PQR.

6. TANK DETAILS AND MEDIA ANALYSIS

Tank details and analysis of limestone & water is as per enclosed Annexure-1&3.

7. SCOPE OF SUPPLY

The bidder shall assume sole responsibility for the design, manufacturing, testing and supply to site. Technical Details of above tank are indicated in (Annexure-I).

The Scope of Supply shall include the following major items:

- a) All the plate materials required for Tank Bottom, Shell, and Roof etc. for the Tanks.
- b) All the baffle plates inside tank.
- c) All the required connections, nozzles and accessories required for each tank as per enclosed Annexure-I.
- d) All the required pad plates on the tanks for supporting outside piping.
- e) All flanges and counter flanges/blind flanges for all nozzles of tank connections including the fasteners (bolts, studs, nuts) and gaskets for these connections.
- f) All the required manhole covers/flanges including the fasteners (bolts, studs, nuts) and gaskets.
- g) All the structural material required for roofs, ladders, wind girders, rails, platforms, stairs, supports, stiffeners, curb angles etc.



- h) Piping from Vent is in bidder's scope of supply.
- i) All anchor bolts, nuts, washers including pad plates (as required for anchoring of tank as per approved design calculations).
- j) Required material for earthing of the tanks up to the nearest risers of earthing mats including earthing pads, strips etc.

The major scope of services shall include:

- a) Design, engineering, preparation of detailed fabrication drawings, bill of material, tag and piece numbers, welding procedures, Erection and commissioning procedures, preventive and overhauling recommendations etc. Stiffeners and other structural framing for supporting the tank shall be designed by the fabricator and properly shown in the fabrication drawings.
- b) Preparation and submission of all drawings.
- c) Any other service required for making the installation complete in all respect within bidder's scope and for satisfactory erection & commissioning of the system, unless specifically EXCLUDED from scope of services.
- d) Surface preparation, Painting of Tanks (Required coats) as indicated in Datasheet for Water Storage Tanks(Annexure-I) at Site/sub vendor works.
- e) Storage, preservation of Materials/Equipment at site.

8. DESIGN AND CONSTRUCTION OF TANK

(Bidder to fill and submit the enclosed technical data sheet along with offer)

8.1 Circuit tank design

Sl. No.	Description	Vendor to confirm
1.	<p>The successful bidder shall furnish design calculations (in native/original format) to BHEL during detailed engineering stage for approval along with the relevant pages of authentic supporting literature e.g. Code, Hand book, National / international Standards etc. All steps including formulas and abbreviations shall be clearly shown in the calculation. All inputs / assumptions shall be indicated in the first sheet of the calculation. Calculation shall be necessarily done in SI UNITS only for the followings: -</p> <p>a) All the slurry tanks shall be designed, fabricated, erected and tested in accordance with the IS:803, latest edition. Additional Corrosion allowance of 1.5mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the Contractor.</p> <p>b) Tanks shall be made from IS: 2062 Gr. Br -E250 mild steel plates of</p>	



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	<p>tested quality. The tanks shall be of welded construction.</p> <p>c) Plate thickness calculation (different courses of shell plate, bottom plate and roof plate thickness), agitator support plate, top wind girder (if applicable), intermediate wind girder (if applicable), tank internal pressure vis-a-vis. allowable value.</p> <p>(i) Plate thickness calculation shall be approved from BHEL / Customer during detailed engineering stage. However, if the addition / summation of calculated value of plate thickness (excluding tolerance on plate as per relevant IS) / nominal minimum thickness specified in the relevant design code / standard and corrosion allowance comes out more than the specified value then the nearest available (higher side) plate thickness in the market shall be provided for bottom, shell and roof plates without any commercial implication.</p> <p>(ii) Negative tolerance on plate thickness shall not be considered in the plate thickness calculation and also shall not be provided in the tank. Only positive tolerance shall be considered.</p> <p>d) All the manhole covers/flanges shall be of hinged & bolted type with nuts, bolts and gaskets in bidder's scope of supply. Manholes shall be provided with davit arrangement for ease of maintenance.</p> <p>e) Wind and seismic load calculations required for foundation bolt design. If required, wind girders shall be provided based on the code design calculations.</p> <p>f) Weight calculation of plates, appurtenances & structures separately shall be included in the Design calculation.</p> <p>g) Maximum Height of unstiffened shell shall be calculated based on the corroded thickness of shell courses. Section modulus of wind girders shall be based on corroded thickness of shell course.</p>	
2.	All appurtenances and mountings shall also be designed as per relevant clauses of IS: 803 as per the design code indicated in Annexure-I.	
3.	Tank shall be suitably constructed for safe, proper and continuous operation under all conditions that can be expected in a plant life without undue strain, corrosion or other operating difficulties.	
4.	Tank seams shall be so positioned that they do not pass through tank connections. Longitudinal seams of various shell courses shall be offset.	
5.	Wherever possible, the inside seam weld shall be ground smooth, suitable for	



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	application of corrosion resistant primer.	
6.	Due consideration shall be given by the supplier for wind load and earthquake effect in the design of tanks.	
7.	Reinforcement in tanks shall be provided as per design code as indicated in Annexure-I. The reinforced connection shall be completely pre - assembled into shell plate.	
8.	The joint efficiency factor of 0.7 to be adopted for design calculation. All the design calculations shall be in accordance with the specified design code.	
9.	All roofs and supporting structures shall be designed to support dead load plus a uniform live load of not less than 150 kg/m ² of projected area. Further, the static and dynamic loads of the agitator assembly along with the agitator platform & support structure for Agitator handling equipment shall be considered over and above the uniform live load.	
10.	Code conformance for flanges / counter flanges shall be as per IS2062 Gr B (Dimensional standard- ANSI B16.5 clause 150/IS 1538). Further, all fasteners used in wetted condition must be of Alloy 926 or better material so that even if it comes in contact with liquid by swelling of rubber lining, thread remains unaffected. Raw material of fastener must undergo Inter-Granular Corrosion test as per ISO- 3651, Part-1 for Nitric Acid test.	
11.	The number & size of nozzles (including flanges, counter flanges and inside piping) indicated in the sketches attached with the data sheets are tentative and bidder guidance purpose only and the same may undergo minor change during detail engineering stage for which no commercial implication shall be entertained by BHEL	
12.	Bidder shall furnish the Standard calculation along with the roof structure calculation during detail engineering for checking the stability of roof.	
13.	The tank shall be designed for filled slurry / atmospheric pressure and design temperature for the tank shall be as specified in Annexure-I.	
14.	Baffle plates shall be provided by bidder, details shall be provided during detail engineering stage	
15.	In calculating the minimum plate thickness, the specific gravity of the liquid shall be taken. Refer Annexure-1 for details.	
16.	The slope of bottom plate shall be maintained at 1:100	

8.2 RUBBER LINER

Sl. No.	Description	Vendor to confirm
1.	The lining shall completely cover the roof, sides and internals of Slurry Tanks, support angle, insert plates, openings, Man Hole / Inspection / Flange openings. etc.,	
2.	Rubber Lining a) Rubber lined surfaces shall utilize 6 mm nominal thickness chlorobutyl rubber. b) Areas of high wear (e.g. leading edges on impeller blades) shall have	

	an additional 6 mm of rubber for abrasion protection. c) No field-applied linings are permitted except for file patch kits.	
3.	Bidder shall source rubber lining work from proven supplier.	
4.	The liners shall have a minimum guaranteed wear life of not less than 8000 hrs.	

9. PACKING AND FORWARDING

S. No	Description	Vendor to confirm
a)	Proper packing to be ensured. Indigenous Supply: WBM & sub system assembly shall be wrapped in polythene bags & packed in a strong rigid wooden crate. Rain water should not enter into the WBM internals during storage in the outer yard of power plant.	
b)	Equipment and process materials shall be packed and semi-knocked down, to the extent possible, to facilitate handling and storage and other machine surfaces from oxidation. Each container, box, crate or bundle shall be reinforced with steel strapping in such a manner that breaking of one strap will not cause complete failure of packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while awaiting erection at the site. All the major equipment's shall be supplied in steel crates. The package shall be supplied in containers and it should be suitable for storage in the outside yard of the plant for a minimum period of 12 months.	
c)	Equipment and materials in wooden cases or crates shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable to tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventive compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper.	
d)	Crates and packing material used for shipping will become the property of owner (NTPC)	
e)	Packaging or shipping units shall be designed within the limitations of the unloading facilities of the receiving ports and the ship will be used. It shall be the bidder's responsibility to investigate these limitations and to provide suitable packaging and shipping to permit transportation to site.	
f)	Packing (tare) shall be part of the equipment cost and shall not be subject to return. The packing should ensure integrity and cohesiveness of each delivery batch of equipment during transportation. In case of equipment assemblies and unit's delivery in the packing of glass, plastics or paper the specification of packing with the material and weight characteristics are to be indicated.	
g)	Each package should have the following inscriptions and signs stenciled with an indelible ink legibly and clearly:	



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	<ul style="list-style-type: none"> a. Destination b. Package Number c. Gross and Net Weight d. Dimensions e. Lifting places f. Handling marks and the following delivery marking 	
h)	<p>Each package or shipping units shall be clearly marked or stenciled on at least two sides as follows.</p> <p>NTPC RAMAGUNDAM (RSTPS) Peddapalli district, Telangana-India PINCODE:505215 EPC CONTRACTOR: "BHARAT HEAVY ELECTRICALS LIMITED, INDIA"</p> <p>In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.</p>	
i)	Each part of the equipment which is to be shipped as a separate piece or smaller parts packed within the same case shall be legibly marked to show the unit of which it is part, and match marked to show its relative position in the unit, to facilitate assembly in the field. Unit marks and match marks shall be made with steel stamps and with paint.	
j)	Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied together with the shipment of materials no single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained.	
k)	The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed.	
l)	Wherever necessary besides usual inscriptions the cases shall bear special indication such as "Top", "Do not turn over", "Care" , "Keep Dry" etc. as well as indication of the center of gravity (with red vertical lines) and places for attaching slings (with chain marks).	
m)	<p>Marking for Safe handling: To ensure safe handling, packing case shall be marked to show the following:</p> <ul style="list-style-type: none"> a. Upright position b. Sling position and center of Gravity position c. Storage category d. Fragile components (to be marked properly with a clear warning for safe handling) 	
n)	Each crate or package is to contain a packing list in a waterproof envelope. All items are to be clearly marked for easy identification against the packing List. All cases, packages etc. are to be clearly marked on the outside to indicate the total weight where the weight is bearing and the correct position of the slings are to bear an identification mark relating the to the appropriate shipping documents. All stencil marks on the outside of cases are either to be made in waterproof material or protected by shellac or varnish to prevent obliteration in transit.	
o)	<p>The packing slip shall contain the following information: -</p> <p>Customer name, Name of the equipment, Purchase Order number with Date, Address of the delivery site, Name and Address of the Sender, Serial Number of circuit tank, BHEL item Code, Gross Weight and Net weight of</p>	



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	Supplied items.	
p)	Prior to transport from manufacturer's work to destination, components unit shall be completely cleaned to remove any foreign particles. Flange face other machined surfaces shall be protected by an easily removable preventive coating followed by suitable wrapping.	
q)	All necessary painting, corrosion protection & preservation measures shall be taken as specified in painting schedule. Supplier shall consider the environment zone which is defined as "very severe" during finishing/shipping.	
r)	Successful bidder shall furnish the detail packing /shipment box details with information like packing box size, type of packing, weight of each consignment, sequence no. of dispatch, no. of consignment for each deliverable item against each billing break up units/ billable blocks. Without these details the BBU shall not be approved during detail engineering. Also, complete billing break-up with above mentioned details shall be submitted within 10days of LOI.	
s)	All items/equipment shall be dispatched in properly packed condition (i.e. no item shall be dispatched in loose condition such that it becomes difficult to store/identify its location at site at a later stage).	
t)	Cases which cannot be marked as above shall have metal tags with the necessary markings on them. The metal tags shall be securely attached to the packages with strong steel binding wire. Each piece, Skid, Case or package shipped separately shall be labelled or tagged properly.	

10. EXCLUSION

S. No	Description	Vendor to confirm
a)	Tank foundation & associated civil works are excluded from bidder's scope of work. However, foundation drawing along with loading data, anchor bolt details etc. shall be furnished by the successful bidder during detailed engineering stage.	
b)	Earthing of tank is not in bidder's scope. However, supply of required material for Earthing of the tanks up to the risers of earthing mats including earthing boss, strips are in the scope of bidder. Connecting these earth strips to the tank and above ground earth riser shall be done by bidder.	
c)	All the instrumentation associated with the tank except Mechanical Level Gauge are excluded from bidder scope of supply. However mechanical Level Gauge with required guide pipe level gauge(Float and Board type mechanical level gauge) to be provided by the bidder.	
d)	Agitator Assembly.	
e)	Level transmitter.	

11. QUALITY ASSURANCE

(As per approved quality plan. However, minimum requirements are as below)

S. No	Description	Vendor to
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		confirm
1.	Quality Plan Requirement:	
	(i) MQP (Manufacturing Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Typical MQP is attached in annexure-4 for indicative purposes for guidance & use.	
	(ii) MQP shall invariably cover w.r.t Inward inspection including on Raw material Procurement, In process and Final inspection in elaborated way/details.	
	(iii) Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL/customer for finalization of Quality plan including test procedure/methodology during pre- award / post award approval / detailed engineering in the event of an order.	
	(iv) No deviation on BHEL/Customer approved MQP is acceptable.	
	(v) Bidder shall agree to submit all cross referred documents other than codes/standards to BHEL/Customer/Consultant.	
	Important Notes shall be included in MQP:	
(a) Latest revision of Standard s & Specification shall apply. Only International Standards are applicable. Indian & Chinese Standards are not applicable		
(b) Materials shall be procured in compliance to Functional Technical Specification.		
(c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product.		
(d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.		
(e) Gauges and measuring Instruments, with valid calibration only shall be used.		
(f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule.		
(g) Finished Products shall be packed to comply with Approved Packing Schedule.		
(h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.		
2.	Domestic / Inland Inspection will be carried out by BHEL/BHEL appointed Third Party Inspection Agency (TPIA) / Customer/Customer Appointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (As applicable). “The inspection charges at actuals incurred by BHEL will be loaded to compare with foreign suppliers”.	



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3.	<p>Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources:</p> <p>(1) Any one of the following Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself.</p> <p>(2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. However cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own, then these charges non claimable by the bidder.</p> <p>List of TPIA</p> <ol style="list-style-type: none"> 1) M/s Bureau Veritas 2) M/s TUV-Nord 3) M/s TUV-SUD 4) M/s TUV Rheinland 5) M/s Lloyds Register 6) M/s DNV 	
4.	<p>Stage Inspection during manufacturing Process: Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review, verification and clearance for further processing. This inspection call shall be given well in advance (at least 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.</p>	
5.	<p>Inspection before dispatch for domestic supplier: Inspection before dispatch at supplier's works shall be carried out by BHEL/BHEL appointed Inspection agency. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet.</p>	
6.	<p>Inspection at Foreign Source/Supplier:</p> <p>(a) As in Sl. No.: 3. shall be ensured without fail.</p> <p>(b) No material / items shall be dispatched without getting the written communication from BHEL / Customer inspection carried out by BHEL/BHEL appointed Third Party Inspection Agency (TPIA) / Customer/Customer Appointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (As applicable).</p> <p>Inspection before dispatch for Foreign supplier: Inspection before dispatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in Sl. no: 03 at supplier's cost.</p>	
7.	<p>Painting shall be done strictly as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall</p>	



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	be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc shall be brought to the notice to BHEL well in advance before proceeding including the BOI being procured for assy / skid like motors etc	
8.	Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages (i) Index Sheet (ii) MQP/RQP/Endorsement Sheet (As applicable) (iii) TCs identified by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP. (iv) Final inspection report + TC including Chemical + Mechanical + HT + NDT etc. (v) Third party Inspection report + TC (vi) Customer CHP/ MDCC (vii) Type test / Performance Test reports conducted (viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer (ix) BOM with As Build Drawings with actual make / rating used with BHEL/customer approved drawings.	
9.	Packing / Seaworthy Packing shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care transit / handling / transshipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before dispatching the material as per contract conditions.	
10.	Outsourcing of test facilities: Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accredited third party lab / Govt. / Govt. Lab for major testing such as NDT, Electrical & Mechanical testing.	
11.	Important Note: No deviation on the above requirement 01 to 10 is acceptable w.r.t Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidences in the offer itself.	
12.	## Necessarily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.	
A)	Minimum Testing requirements to be considered are as below:	
1.	For surfaces with rubber lining Welding shall be visually inspected to verify the absence of rough area and unacceptable transition between surfaces which prevent the adequate adherence of rubber. The acceptance criteria shall be as per latest standard.	
2.	For surfaces with rubber lining, degree of cleaning shall be visually checked before the application of the coating. There must be no area with oxidation, dirt or partially or generalized corrosion defects.	
3.	Test certificates shall be issued for each lot of raw material used in the coating, corresponding to specific weight and traction resistance.	



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4.	For surfaces with rubber lining, adherence test shall be conducted on production samples. Adherence test shall be conducted on the actual surface through hammering. In order to verify the absence of air packets (or) surface without adherence.	
5.	For surfaces with rubber lining, Coating thickness shall be checked at 100%. A High voltage porosity test will be conducted on 100 % of the coated surface.	
6.	Wear resistant parts shall be UT/RT tested to check soundness after suitable heat treatment. Check for chemical composition, hardness and microstructure shall be carried out.	
B)	General Inspection requirements to be considered are as below:	
1.	Bidder shall furnish written copies of shop production, fabrication and quality test procedures and drawings to be used for review by BHEL / NTPC prior to manufacture. Inspection of above mentioned tests by BHEL/ NTPC representative at bidder's works is envisaged.	
2.	The Bidder shall furnish performance test procedure along with standard. The test procedure will be reviewed and approved by the BHEL/customer.	
3.	For surfaces with rubber lining Welding shall be visually inspected to verify the absence of rough area and unacceptable transition between surfaces which prevent the adequate adherence of rubber. The acceptance criteria shall be as per latest standard.	
4.	For surfaces with rubber lining, degree of cleaning shall be visually checked before the application of the coating. There must be no area with oxidation, dirt or partially or generalized corrosion defects.	
5.	Test certificates shall be issued for each lot of raw material used in the coating, corresponding to specific weight and traction resistance.	
6.	For surfaces with rubber lining, adherence test shall be conducted on production samples. Adherence test shall be conducted on the actual surface through hammering. In order to verify the absence of air packets (or) surface without adherence.	
7.	For surfaces with rubber lining, Coating thickness shall be checked at 100%. A High voltage porosity test will be conducted on 100 % of the coated surface.	
8.	<p>For Rubber lining:</p> <p>Ageing Test : 70°C for 24 hrs. (IS: 3400 Pt.4) Change in Tensile Strength: ± 5% Elongation at break: ± 10%</p> <p>Abrasion Test : Wt. loss – Max. 25%</p> <p>Tensile Strength : ≥ 2 MPa for 4 mm thick Rubber specimen.</p> <p>Elongation at break : ≥ 400% minimum for 4mm thick rubber specimen</p> <p>Peeling strength : ≥ 3 N/mm</p> <p>Hardness : 53 ± 5° Shore A</p> <p>Spark Test : 1.5 KV/ mm</p>	



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9.	Lining shall be visually inspected to ensure free from poorly weed out fibers, entrapped air and exposed fires. Defects are to be repaired by sandblasting a generous area around the defected portion and applying a layer of rubber material.	
10.	Spark test shall be carried out at appropriate areas in the presence of Purchaser. Vendor should conduct test as per relevant standards.	
11.	After installation, the Rubber lining shall be subjected to testing at site as per relevant standards. If the performance is found not to meet the requirements as specified, the Rubber lining shall be rectified or replaced by the Vendor without any extra cost to the Purchaser.	
12.	All testing requirement/certificates shall be in line with QAP to be approved by customer during detailed engineering	
C)	PURCHASE AND SERVICE	
1.	The major items/ equipment's/ components to be manufactured in the shop of the contractor i.e. in-house items and those procured from sub-vendors / sub-manufacturer / sub-contractors i.e. bought out items (BOIs) shall be listed out by the contractor in their bid proposal.	
2.	The list of manufacturers/ sub-vendors for all the BOIs envisaged in contract shall be included in the bid proposal by the contractor which shall be reviewed by the NTPC during post bid discussions and the list of proposed manufacturers / sub-vendors for each of the BOIs shall be agreed/ approved. If any item is left out or gets included during detailed engineering, the contractor shall propose the manufacturer's / sub vendor's details for review / approval of NTPC, prior to initiating the procurement of such materials.	
3.	This specification also contains the Indicative vendor list (with disclaimer) mentioned against particular item/ equipment/ component/ system etc. The vendor list is only indicative and not exhaustive. Refer Annexure-5.	

12. PAINTING

The painting details shall be finalized during contract stage.

13. CONFLICT

S. No	Description	Vendor to confirm
	Bidder's equipment shall be designed for and shall meet the service, performance and minimum level of quality requirements specified. Bidder shall be solely responsible for advising NTPC in writing of any conflicts between the specifications and Bidder's design, including performance and levels of quality. Bidder agrees that its obligations, liabilities and warranties shall not be diminished or extinguished due to its meeting the requirements of the Specification.	

14. COMMISIOING SPARES

S. No	Description	Vendor to confirm
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LIST OF COMMISSIONING SPARES

Sl. no	Description	Qty.	Unit	Unit price	Total Ex- Works Prices duly packed
1	Gasket of each size	2 nos.			
2	Nuts, bolts & washers of each size (nos. of bolts, nuts & washers as required for each nozzle) as per approved Drg.	1 lot			
3	Any other item required for successful commissioning of the tanks including rubber lining (to be specified clearly by bidder)	1 lot			

1. The items indicated in the above list are minimum. Any other spares if required shall be included by bidder in the above list
2. Bidder shall furnish unit price of commissioning spares in above format along with the Bid. Any part even though not mentioned in list furnished but required at later date shall be supplied free of cost.
3. Bidder to note that the items indicated in the above list shall be provided prior to commissioning. Further, items indicated in the list shall be supplied over and above the consumables that is supplied along with the Tanks prior to start up.

15. DOCUMENTATION

S. No	Description	Vendor to confirm
	Bidder shall submit necessary data, documents , GA drawings (PDF & DWG), sections, sub-assembly drawings, specifications of main and sub components and necessary set of operation & maintenance manual as asked by NTPC must be furnished by bidder in soft copy forms for review. The documents will be in PDF as well as editable form like DOC, XLS, DWG.	

A. TECHNICAL DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER:

Sl. No.	Description	Purpose
1.	Reference plant details of similar or higher capacity slurry tank supplied	QR
2.	Sign & Seal of bidder on all pages specification	Technical evaluation of Bid
3.	Deviation list (if any to be submitted by Bidder)	TEB
4.	GA drawing	TEB
5.	Special tools list, Start-up & Commissioning Spares	TEB
6.	Terminal point details	TEB
7.	Catalogue	TEB

B. DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:

Sl. No.	Description	Handing Over of Documents after PO in weeks	Document required for



1.	Design Calculation for Tank	1	Customer Approval
2.	GA of Tank including nozzle details, Staircase, bill of material, weld details etc.	1	Customer Approval
3.	Plate cutting layout of storage tank (shell, roof and bottom plate)	1	Customer Approval
4.	Load Data of Tank Foundations and Details of Anchor Chair for Tank Foundations	1	Customer Approval
5.	Quality plan & Inspection and Test Procedure	1	Customer Approval
6.	Special tools list, Start-up & Commissioning Spares	1	Customer Approval
7.	Sub vendors List	1	Customer Approval
8.	Manufacturing Schedule	1	Review
9.	Catalogue	1	Customer Submission
10.	Pro-forma Packing List	1	Dispatch

ANNEXURES LIST:

Annexure Sl. No.	Description
1.	Circuit Tank Details
2.	Deviation list.
3.	Media Analysis.
4.	Customer Specification.
5.	Indicative vendor list.

VARIANT TABLE

VAR. No.	DESCRIPTION	MATERIAL CODE	Qty /Project
00	MILL CIRCUIT TANK -44.4TPH WBM SYSTEM	BA9789251009	2 Nos

RECORD OF REVISIONS

Rev. No.	Date	Revision Details	Revised	Approved

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