BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-1-Aug-20

CORRIGENDUM- 02

PROJECT	**:**	3X200+3X500+1X500 MW NTPC KORBA TPP-FGD
PACKAGE	**:**	**MISC. TANKS(SITE FABRICATED)**
ENQUIRY NO	**:**	PE/PG/KR1/E-6469/2020 **Dated. 09.07.2020**
SUBJECT	**:**	**PRE- BID CLARIFICATION**

Type of Corrigendum			
Technical Corrigendum -	☑	Commercial Corrigendum -	☐

In reference to the above mentioned tender enquiry for **MISC. TANKS(SITE FABRICATED)** package

Please note the following.

1. All bidders are requested to go through the attached pre-bid clarification.
2. Due date for offer submission has been extended from 01/08/2020 to 11/08/2020 (till 11:00 am) and P1 shall be opened on 11/08/2020 at 1:30 PM.

All the other terms and conditions of the tender enquiry remain unchanged. All the bidders are requested to quote accordingly.

Corrigendum

Yours faithfully,

For and on behalf of BHEL

GURU DAS

Digitally signed by GURU DAS
DN: cn=GURU DAS, o=BHEL, ou=PEM, email=gurudas@bhel.in, c=IN
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Guru Das
Manager

PRE BID CLARIFICATION SCHEDULE

Tender reference	**PE/PG/KR1/E-6469/2020**
Project:	**3X200+3X500+1X500 MW NTPC KORBA TPP-FGD**
Package:	**MISC.TANKS (SITE FABRICATED)**
Bidder:	**THERMOSYSTEMS PVT. LTD, HYDERABAD**

Sl.No.	Section / Part/Subsection	Page No.	Clause No.	Bid Specification	Bidder's Query	Purchaser's Reply
1	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / 1.0 SCOPE OF SUPPLY	84 of 391	1.3	h) Supply and erection of vent valves shall be in bidder's scope.	As the FGD tanks are of atmospheric tanks, we are not anticipating any valve at the vent nozzle connection. Please confirm.	Vent valve is not applicable for these FGD tanks. However bidder shall provide vent with suitable bird screen.
2	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS / 1.0 SCOPE OF SUPPLY	85 of 391	1.6	Quantity and size of spare nozzles as per FGD Tank schedule (Section-III, Annexure-8) shall be supplied by the bidder.	As spare nozzles are not indicated in the annexure - 10 (Nozzle schedule), we are not considering any spare nozzles. Please confirm.	Bidder to provide nozzles as per tanks Nozzle Schedule (Annexure - 10) of technical specification.
3	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS / 2.0 SCOPE OF SERVICES	85 of 368	2.3	Erection & Commissioning of rubber lining / VE Flake glass lining.	We understood that all inside surfaces of FGD tanks (for which is lining is applicable) including inside surfaces of roof, shell & bottom shall be considered for lining. Please confirm.	Refer clause 4.0 Rubber lining /SECTION –I/SUB SECTION –C1-B at page 93 of 391 of technical specification.
4	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS / 2.0 SCOPE OF SERVICES	86 of 391	2.5	Minor civil work like chipping of foundation, grouting below base plate for all structures, equipment, grouting of pockets, excavation & filling of earth for buried MS pipes if and as required.	Plase clarify the scope of supply of grouting material.	Supply of grouting material is in the scope of bidder.
5	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS / 3.0 DESIGN CONSIDERATIONS	86 of 391	3.3 a	Bottom plate shall be 8.0 mm thick (minimum). Minimum 6 mm (excluding tolerance on plate as per relevant IS) thick plates including corrosion allowance shall be p rovided for shell plates and minimum 8 mm for roof plates for all ta nks. However, Auxiliary absorbent tank shall be provided with mini mum 8 mm thickness for shell, refer min. shell plate thickness defined in tank schedule Annexure-8.	Both the clauses are contradicting regarding the minimum thickness of shell plates to be considred. Please clarify.	Bidder to follow tank schedule (Annexure-8) of technical specification for minimum plate thickness requirement of tanks.However, final shell thickness shall be decided based on the design calculation submitted by successful bidder during detail engineering.
	PE-TS-466-167-A101 / SECTION-II / SUB-SECTION A / TECHNICAL SPECIFICATION FOR MISCELLANEOUS TANKS / 3.2 VERTICAL CYLINDRICAL STORAGE TANKS	329 of 391	3.2.6	Each shell course shall be of uniform width throughout longitudinal weld in plates. Make up for the course width shall not be permitted. Shell plates in each course width shall be so arranged that all vertical joints be staggered having a minimum of 600 mm stagger. Shell thickness could be reduced in upper courses depending on design requirements but in no case the plate thickness shall be less than 8 mm.		
6	PE-TS-466-167-A101 / SECTION-II / SUB-SECTION A / TECHNICAL SPECIFICATION FOR MISCELLANEOUS TANKS / 3.2 VERTICAL CYLINDRICAL STORAGE TANKS	329 of 391	----	3.2.4 All bottom plates shall have lap weld joints on all sides with overlap not less than five times the plate thickness. 3.2.9 Roof plates shall have lap joints with lap not less than 25 mm and lap weld over the top surface only. Roof plates shall have continuous fillet welds around the tank curb angle. No joint of roof plate over the supporting frame shall be made.	Referred clauses are contradicting regarding the type of joints to be considered for joining of bottom plates & roof plates. Please clarify.	Type of joints to be considered for joining of bottom plates & roof plates is to be considered in line with clause 3.2 / SECTION-II / SUB-SECTION-A page 336 of 391 of technical specification.
	PE-TS-466-167-A101 / SECTION-II / SUB-SECTION-A / GUIDANCE FOR DESIGNING AND F ABRICATION OF STEEL CONSTRUC TIONS FOR RUBBERLINING & VE G LASS FLAKE LINING	336 of 391	----	3-2 : Butt joint is preferable and overlap joint is not recommended for lining vessels.		
7	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS / 3.0 DESIGN CONSIDERATIONS	87 of 391	3.3 a	However, if the addition / summation of calculated value of plate th ickness (excluding tolerance on plate as per relevant IS) / nominal minimum thickness specified in the relevant design code / standard and corrosion allowance of 1.5 mm comes out more than 6 mm th en the nearest available (higher side) plate thickness in the market s hall be provided for shell and roof plates without any commercial implication.	Referred clauses are contradicting regarding the corrossion allowance to be considered for calculating the thickness of the shell, roof & bottom plates of FGD tanks. Please clarify.	Corrosion allowance shall be considered as 1.5 mm in line with clause 3.3 a)/ page 87 of 391/ SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS of techincal specification.
	PE-TS-466-167-A101 / SECTION-II / SUB-SECTION A / TECHNICAL SPECIFICATION FOR MISCELLANEOUS TANKS / 3.2 VERTICAL CYLINDRICAL STORAGE TANKS	326 of 391	3.1.3	All tanks will be designed for the capacities, dimensions and working conditions as specified in Tank schedule and GA Drawing of tanks. These tanks will be provided with all necessary connections as specified. The design of tanks will be such as to allow easy inspection, cleaning and repair. Due consid eration will be given to wind loading and adequate stiffening will be provided to prevent failure of tank due to buckling when it is empt y. A 3.0 mm corrosion allowance for shells, bottom and roofs above and beyond the required thickness / calculated thickness / nominal thickness as specified in the design code shall be provided.		
8	PE-TS-466-167-A101 / SECTION-I / Sub Section-C2-A /TECHNICAL REQUIREMENT	118 of 391	14.02.00	Equipments requiring monitoring during regular operation shall be approachable from the ground floor through sta ircase. Staircase with minimum width of 1200 mm shall be provided for approach to elevated stru ctures at 5m height from the nearest platform. Below this height a vertical ladder with minimum clear width of 600 mm may also be acceptable.	Referred clauses are contradicting regarding the minimum width of spiral stair case to be provided on the tank. Please clarify.	Minimum staircase width shall be 1200 mm.
	PE-TS-466-167-A101 / SECTION-II / SUB-SECTION A / TECHNICAL SPECIFICATION FOR MISCELLANEOUS TANKS / 3.1 General Requirement	327 of 391	3.1.14.1	All cylindrical vertical tanks shall be provided with spiral staircase and shall conform to the requirements specified in design codes / standards unless specified otherwise. All stair treads shall be 32 mm steel fabricated gratings or 8mm thk. chequered plate which will be decided during detail engineering stage. Each tread, if needed, shall be housed in individual steel fabricated frame which shall be adequately supported from the tank outer periphery. The staircase shall have minimum 800 mm clear width.		
9	PE-TS-466-167-A101 / SECTION-II / SUB-SECTION A / TECHNICAL SPECIFICATION FOR MISCELLANEOUS TANKS / 3.1 General Requirement	328 of 391	3.1.18	Float level indicators other than float and arrow type level indicator, gauge glass shall be provided.	Please clarify the applicability of this clause to Misc. FGD tanks package.	Supply and erection of all type of instuments and accessories are excluded from bidder's scope in line with clause 9.0 1) page 89 of 391 /section I,Sub section -C1-A of technical specification.
10	PE-TS-466-167-A101 / SECTION-III / Annexure-8, TANK SCHEDULE & GA DRAWING (TYPICAL) WITH AGITATOR PLATFORM	382 of 391	---	**13) Material specification:** e) Nozzle - A106 Gr.B h) Nozzle Necks - IS:1239	Meaning of Nozzle & Nozzle necks shall be same. But two different specifications are indicated. However we consider A106 Gr.B for nozzle necks and IS1239/IS3589 (as given in the annexure 9, MATERIAL OF CONSTRUCTION) for internal extended piping of inlet nozzles. Please confirm.	The piping material specification shall be as per Annexure-9 (Material of construction) of technical specification. The material of nozzle/nozzle neck shall be similar to pipe material.
	PE-TS-466-167-A101 / SECTION-III / Annexure-8, TANK SCHEDULE & GA DRAWING (TYPICAL) WITH AGITATOR PLATFORM	381 of 391	---	**7) Pipe Material Specification:** a) 150NB & below - SA106 Gr.B (IIR) b) Above 150NB - IS:3589 (IIR)		

11	PE-TS-466-167-A101 / SECTION-III / Annexure-8, TANK SCHEDULE & GA DRAWING (TYPICAL) WITH AGITATOR PLATFORM	382 of 391	---	**13) Material specification:** c) Stairways & Platforms - IS 2062 E250 Gr A/BR	Please clarify stair ways, platforms shall be galvanized or painted with applicable external paint.	The same shall be galvanised as per specification.
12	PE-TS-466-167-A101 / SECTION –I, SUB SECTION –C1-B	95 of 391	3.2	Process water Tank, Belt Filter Wash Tank and Clarified (Cake wash) Water Tank. - Epoxy lining of minimum 150 micronthickness (3 coats of 50 micron each)	Referred clause in the section C1-B calls for Epoxy lining of minimum 150 micronthickness (3 coa ts of 50 micron each) for internal surfaces of Process water Tank, Belt Filter Wash Tank and Clarified (Cake wash) Water Tank. But from the referred customer specification, We understood that DFT for each coat of epoxy lining shall be 150micron. Total DFT of epoxy lining shall be 450microns in 3 coats. Please confirm. Please provide the detail specification for epoxy lining and confirm the primer requirement.	Total DFT required is 150 microns. Number of coats and detail specifcation of Epoxy lining shall be decided during detailed engnieering as per paint manufacturer recommendation. Primer shall be applicable in line with painting specification sub section C2-C of technical specification.
	PE-TS-466-167-A101 / SECTION-I, SUB-SECTION-C2 A / CUSTOMER SPECIFICATION: TECHNICAL REQUIREMENT	118 of 391	13.03.07	The tanks shall be of welded construction. Interior surface of the tanks shall be lined with replacable chlorobuty/bromobutyl rubber lining of minimum 4 mm thickness or with vinly ester based flake glass lining of minimum 3 mm thickness or Epoxy lining minimum three coats of 150 micron thickness and the outside surface shall be coated with paint as approved by the Employer.		
13	PE-TS-466-167-A101 / SECTION-III / Annexure-8, TANK SCHEDULE & GA DRAWING (TYPICAL) WITH AGITATOR PLATFORM	383 of 391	---	**16) Nozzle details:** 16.1) Sizes & Qty.	We understood that referred nozzle details are pertaining to agitator mounting nozzles. In that case these nozzle sizes are contradicting with agitator nozzles sizes given in the ANNEXURE-10, TANKS NOZZLE SCHEDULE. Please clarify.	In case of contradiction of nozzle details pertaining to agitator mounting, consider the tank nozzle schedule, Annexure-10 of technical specification. Further, the shown sizes and number of nozzles are indicative and for estimation purpose only. The final quantity and size shall be decided during detail engineering as per technical specification/design code/functional requirement. Same shall be supplied by bidder without any commercial implication.
14	PE-TS-466-167-A101 / SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS / 3.0 DESIGN CONSIDERATIONS	86 of 391	3.3 a	Bottom plate shall be 8.0 mm thick (minimum). Minimum 6 mm (excluding tolerance on plate as per relevant IS) thick plates including corrosion allowance shall be p rovided for shell plates and minimum 8 mm for roof plates for all ta nks. However, Auxiliary absorbent tank shall be provided with mini mum 8 mm thickness for shell, refer min. shell plate thickness defined in tank schedule Annexure-8.	In the first referred clause it is mentioned that for auxiliary absorbent tank only min. shell thickness shall be 8mm for other tanks it is 6mm. But in the tank schedule (Annexure-8), it is indicated that shell courses above the 4th course of Lime stone slurry tank shall be 8mm minimum. Please clarify.	Bidder to follow tank schedule (Annexure-8) for minimum plate thickness requirement of tanks.However, final shell thickness shall be decided based on the design calculation submitted by successful bidder during detail engineering.
	PE-TS-466-167-A101 / SECTION-III / Annexure-8, TANK SCHEDULE & GA DRAWING (TYPICAL) WITH AGITATOR PLATFORM	383 of 391	---	**Shell plate thickness for Lime stone slurry tank:** As per design code, min. 14mm for 1st & 2nd coarse of shell,12 mm for 3rd coarse, 10mm for 4th coarse and 8 mm min. for other coase of shell.		
15	PE-TS-466-167-A101 / SECTION-III / Annexure-10 (Nozzle schedule)	---	---	Regarding overflow line	We understood that Nozzle (on the tank shell) for overflow line only be in the bidder scope. Further piping from overflow nozzle to bottom of tank/terminal point shall be in client scope. Please confirm.	Only drop down pipe within the tanks, for each tank shall be provided by bidder. Piping outside tank nozzle is excluded from bidder's scope. However, any supporting arrangement requried for these pipes shall be provided by bidder.
16	PE-TS-466-167-A101 / SECTION-II / Sub Section-A / STANDARD TECHNICAL SPECIFICATIONSMECHANICAL / GUIDANCE FOR DESIGNING AND FABRICATION OF STEEL CONSTRUCTIONS FOR RUBBER LINING	342 of 391	6-1	Any surface of the base metal to be lined should not be coated with paint or oil.	Referred clause calls for Any surface of the base metal to be lined should not be coated with paint or oil, where as in painting specification of FGD tanks it is specified that inside surfaces of tanks shall be painted with ROZP primer. Please clarfy.	Bidde to consider primer as specified in the specification. However, final requirement of type of primer shall be subjected to lining manufacturer's recommendation and to be provided. Same shall be discussed & finalised during detail engineering.
	PE-TS-466-167-A101 / SECTION-I / Sub Section-C2-C PAINTING SPECIFICATION	283 of 391	Sl.no. 43	Tank internal structure Inside surfaces - Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) (Liner is inside the tank, hence primer is only envisaged; Protection till erection only).		
17	PE-TS-466-167-A101 / SECTION-I, SUB-SECTION-C2 A / CUSTOMER SPECIFICATION: TECHNICAL REQUIREMENT	113 of 368		**7.08.00 Auxiliary Absorbent Tank** 7.08.06 Suction screens shall be installed to protect the pump.	Please clarify the scope of supply of suction screens. If in case in bidder scope, please provide the MOC & mesh size & wire size of suction screens to be considered.	Scope of supply of suction screens shall be in bidder scope. The MOC and other details shall be decided during detail engineering and shall be subjected to end customer approval.
	PE-TS-466-167-A101 / SECTION-I, SUB-SECTION-C2 A / CUSTOMER SPECIFICATION: TECHNICAL REQUIREMENT	115 of 368		**10.00.00 SLURRY & PROCESS WATER TANKS** 10.01.00 Coarse-screen(s) at suction-side of slurry recirculation pumps shall be provided.		
18	PE-TS-466-167-A101 / SECTION-III / Annexure-8, TANK SCHEDULE & GA DRAWING (TYPICAL) WITH AGITATOR PLATFORM	383 of 391	14.I	**Shell plate thickness:** **Lime stone slurry storage tank:** As per design code, min. 14mm for 1st & 2nd coarse of shell,12 mm for 3rd coarse, 10mm for 4th coarse and 8 mm min. for other coase of shell **Auxiliary absorbent tank:** As per design code, min. 12 mm for 1st coarse,10 mm for 2nd coarse of shell and 8 mm min. for other coase of shell	In the referred clauses you have provided the min. thickness to be considered for respective shell courses but width of shell courses to be considered are not given. Please provide the same.	The width of shell course shall be considered as 2000 mm.

PRE-BID CLARIFICATION SCHEDULE

Sub: Tender for MISC.TANKS (SITE FABRICATED), 3X200+3X500+1X500 MW NTPC KORBA TPP-FGD
Enquiry No- PE/PG/KR1/E-6469/2020

Sl. No.	Section/Clause/Page No.	Statement of the referred clause	Clarification required	BHEL's Clarification
	SPECIFICATION NO.: PE-TS-466-167-A101			
1	page 326 0f 391, Sl. No. Clause 3.1.3, Corrosion Allowance	A 3.0 mm corrosion allowance for shells, bottom and roofs above and beyond the required thickness / calculated thickness / nominal thickness as specified in the design code shall be provided.	CORROSION ALLOWANCE is mentioned as 1.5mm at - 1. Annexure 8 (sl. No. 14 h), 2. Sl. No. 3.3 a of SECTION –I, SUB SECTION –C1-A, 3. Sl. No. 10.01.00 of TECHNICAL SPECIFICATION SECTION-VI BID DOC. NO.:CS-0011-109(3)-9 and 5. at other places of specifications, Please clarify the corrosion allowance to be considered.	Corrosion allowance shall be considered as 1.5 mm in line with clause 3.3 a)/ page 87 of 391/ SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS of techincal specification.