



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-11-May-20

CORRIGENDUM- 06

PROJECT	:	3X660 MW NPGCPL NABINAGAR STPP (FGD PKG)
PACKAGE	:	MISC. TANKS(SITE FABRICATED)
ENQUIRY NO	:	PE/PG/NB2/E-6402/2019 Dated. 05.03.2020
SUBJECT	:	PRE-BID CLARIFICATION + DUE DATE EXTENSION

Type of Corrigendum			
Technical Corrigendum -	☒	Commercial Corrigendum -	☒

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

Please note the following.

1. Please find the attached pre-bid clarification attached along with the corrigendum-06.
2. Due date for offer submission has been extended from 11/05/2020 to 27/05/2020 till 2:00 pm and P1 shall be done at 3:00 pm on 27/05/2020.

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

Yours faithfully,

For and on behalf of BHEL

Guru Das
Dy. Manager

PRE BID CLARIFICATION REPLY						
Tender reference	PE/PG/NB2/E-6402/2019					
Project:	3X660 MW NPGCL NABINAGAR STPP (FGD SYSTEM PACKAGE)					
Package:	MISC.TANKS (SITE FABRICATED)					
Sl.No.	Section / Part/Subsection	Page No.	Clause No.	Bid Specification	Bidder's Query	Purchaser's Reply
1	SECTION-I / Sub Section-C1-A	52 of 500	1.3	h) Supply and erection of vent valves shall be in bidder's scope.	From the GA drawing for Miscellaneous FGD tanks (annexure-III, sub Section-D, Section-I), we understood that vent shall be of atmospheric type. Hence we are not anticipating any valve at the vent nozzle connection. Please confirm.	Supply of all valves are excluded from bidder scope. Vent valves are not applicable as per GA drawing of tanks, bidder shall provide vent with suitable bird screen.
2	SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS	53 of 500	1.6	Quantity and size of spare nozzles as per FGD Tank schedule (Section-III, Annexure-8) and GA drawing for Miscellaneous FGD tanks shall be supplied by the bidder.	As spare nozzles are not indicated in the Tank schedule (Section-III, Annexure-8) and GA drawing for Miscellaneous FGD tanks, we are not considering any spare nozzles. Please confirm.	BHEL noted and confirmed.
3	SECTION-I / Sub Section-C1-A / SPECIFIC TECHNICAL REQUIREMENT-TANKS	54 of 500	2.4	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.	Please clarify the scope of supply of grouting material.	The supply of grouting material for pockets and between tank bottom plate & ring wall (if required) shall be in bidder's scope. Further excavation & filling of earth for buried MS pipes is excluded from the scope of the bidder.
4	SECTION-I / Sub Section-C1-A	58 of 500	9.0	2) The agitator components of all agitators including the agitator of drain pits/ sumps shall be provided as a free issue item to the bidder. The erection and commissioning of the agitators shall be in bidder's scope of work. However, BHEL shall arrange for the supervision of the erection and commissioning of the agitator assembly to the bidder as a free issue service.	Please provide the approximate Weights of the agitators to be erected on the tanks for estimating the erection charges.	Refer Annexure-1 attached herewith for the static and dynamic loads of agitators. Further the no. of nozzles for agitators shall be same as the agitator quantity for the particular tank as indicated in the tank schedule.
5	SECTION-I / Sub Section-C1-B	61 of 500	4.0	2 The rubber used for the lining of the tank is given below: Refer table	Similar Rubber lining specification is indicated for the auxiliary absorbent tanks and for remaining tanks. However, from FGD tanks schedule & GA drawings of FGD tanks, we understood that thickness of rubberlining for auxiliary absorbent tanks is 4mm and for the remaining tanks is 5mm. Please confirm.	Bidder understanding is correct. Thickness of rubber lining for auxiliary absorbent tanks is 4mm and for the remaining tanks is 5mm.
6	SECTION-I / Sub Section-C1-B	63 of 500	7.0	Please refer Sub Section- C2 – B, SECTION – I for Packing Procedure.	We understood that packing procedure shall be as per cl.31.00.00 (PACKAGING AND TRANSPORTATION) given in pg.no.166 of 500. Please confirm.	BHEL Noted and confirm.
7	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Material specification: Nozzle - A106 Gr.B Nozzle Necks - IS:1239	As per our knowledge, Meaning of Nozzle & Nozzle necks shall be same. But two different specifications are indicated. Please clarify.	BHEL Noted. The material of Nozzle and nozzle neck shall be same. The revised pipe material specification has been specified as annexure-2 (attached herewith). The same shall be followed for Nozzle and Nozzle neck. Further the rubber lining of the pipes and fittings shall be in line with the specification requirement.
8	SECTION-III / ANNEXURE-8 (TANK SCHEDULE)	496 of 500	7	Pipe Material Specification: 150NB & below - SA106 Gr.B (IIR) Above 150NB - IS:3589 (IIR)	The referred pipe material specification is contradicting with the nozzle material specification indicated in the GA drawing for Miscellaneous FGD tanks (annexure-III, sub Section-D, Section-I). Please clarify. Please specify the thickness of pipes to be considered for inlet piping to be extended upto the bottom of tank. Also clarify what is "IIR" indicated in the suffix of referred pipe material specification.	The revised pipe material specification has been attached herewith in Annexure-2. The same shall supersede the pipe material specified in the GA drawings for Miscellaneous FGD tanks and pipe details provided elsewhere in the specification. Further the rubber lining of the nozzles shall be in line with the specification requirement.
9	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Design Data: Inside lining - 5mm thick of best quality bromine butyl rubber lining with hardness 55+/-5 (Shore A hardness).	In elevation details of tanks indicated in the GA drawing for Miscellaneous FGD tanks (ANNEXURE-III), rubberlining is only shown on the inside surface of the shell. Rubber lining not shown on the inside surface of the bottom & roof of tank. Hence please clarify whether inside surface of bottom & roof to be rubberlined or not. If required to be rubberlined, please clarify the following points 1. Thickness of the rubberlining to be considered for bottom & roof. 2. Bottom and roof plate joints shall be of lap joints as per cl.no.3.2.4 & 3.2.9 of STANDARD TANK SPECIFICATION, pg 445 of 500 OR butt weld joints as per cl.no.3-2 of GUIDANCE FOR DESIGNING AND FABRICATION OF STEEL CONSTRUCTIONS FOR RUBBER LINING, pg 452 of 500. 3. Roof structure shall be considered on the internal side of the roof OR on the external side of the roof.	The lining shall completely cover the roof, sides and internals of Slurry Tanks, support angle, insert plates, openings, Man Hole / Inspection / Flange openings. etc., 1. Thickness of the rubber lining to be considered for bottom & roof shall be as indicated in the respective GA drawing. 2. the recommended practice for the bottom and the roof plate joints along with other details have been specified in the chapter of GUIDANCE FOR DESIGNING AND FABRICATION OF STEEL CONSTRUCTIONS FOR RUBBER LINING however bidder may follow any other best practice for fabrication of steel constructions for rubber lining or as specified by rubber lining vendor. 3. the roof structures shall preferably be considered on the external side of roof.
10	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Material specification: Hand railing - IS 1161	Both the referred clauses regarding material specification of hand railing is contradicting. Please clarify.	The material specification of handrails shall be IS:1161. Further, Size of hand rails on stairway and tank roof / top shall be minimum 32 NB.
	SECTION-I / Sub Section-C1-A	59 of 250	12	5) Size of hand rails on stairway and tank roof / top shall be minimum 32 NB and shall conform to IS 1239 (M).		

11	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Material specification: Fittings - A-105	A105 MOC is only applicable for socket weld fittings of pipe size 50NB & below. Please specify the MOC to be considered for fitting of pipe sizes above 50NB.	The revised pipe material specification has been attached herewith in Annexure-2. The same shall supersede the pipe & fitting material specified in the GA drawings for Miscellaneous FGD tanks and pipe & fitting details provided elsewhere in the specification. Further the rubber lining of the pipes and fittings, nozzles etc shall be in line with the specification requirement.
12	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Material specification: STAIRWAYS & PLTFS - IS 2062 E250 Gr A/BR HAND RAILING - IS:1161	From the referred material specification we understood that stair ways, platforms, hand railing shall be of non galvanized. And they shall be painted as per painting spec applicable for external surfaces of the tanks.	Staircases, handrailing and platforms shall be galvanized in line with technical specification.
13	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Regarding agitator nozzles	Please provide the size of agitator nozzles to be provided on the tank. We consider quantity of agitator nozzles as per tank schedule (Section-III, Annexure-8). Please confirm.	Refer Annexure-1 attached herewith for the static and dynamic loads of agitators. Further the no. of nozzles for agitators shall be same as the agitator quantity for the particular tank as indicated in the tank schedule.
14	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Design Data: Corrosion allowance - 1.5mm for shell and bottom plate.	Referred GA drawings of FGD tanks calls for corrosion allowance for shell & bottom shall be considered as 1.5mm, where as customer specification calls for 3mm. Please clarify which is to be considered.	Corrosion allowance shall be 1.5 mm refer clause 3.3 (a), SECTION -I, SUB SECTION -C1-A of technical specification.
	SECTION-I / Sub Section-C2-A / TECHNICAL REQUIREMENT	97 of 500	10.01.00	Additional Corrosion allowance of 3mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the Contractor.		
	SECTION-I / Sub Section-C2-A / TECHNICAL REQUIREMENT	100 of 500	13.03.07	Additional Corrosion allowance of 3mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the Contractor.		
15	SECTION-I / Sub Section-C2-A / TECHNICAL REQUIREMENT	101 of 500	14.02.00	Equipments requiring monitoring during regular operation shall be approachable from the ground floor through staircase. Staircase with minimum width of 1200 mm shall be provided for approach to elevated structures 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.	The staircase shall have minimum 1200 mm clear width.
	SECTION-II / Sub Section-A / STANDARD TANK SPECIFICATION	444 of 500	3.1.14.1	The staircase shall have minimum 800 mm clear width.		
16	SECTION-I / Sub Section-C2-C	392 of 500	Sl.no. 42 & 43	Regarding painting specification of the tanks.	In the referred clauses, painting specification is given for outside & inside surfaces of tanks only. Painting scheme to be considered for soil side of the bottom plates is not given. Kindly provide the same.	Bidder refer the Painting specification. Further outside of bottom surface of tanks shall have 2 Coats of High Build Coal Tar Epoxy suitably Pigmented, DFT:80-100 microns each Coat.
17	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Regarding overflow line	We understood that overflow nozzle at the tank shell only in the bidder scope. Further piping from overflow nozzle to bottom of tank/terminal point shall be in client scope. Please confirm.	BHEL noted and confirmed. However necessary pad plates on tank shell for supporting of the overflow pipe shall be provided by the successful bidder.
18	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Regarding vent size	From the GA drawing for Miscellaneous FGD tanks, Size of the vent is observed as 80NB/50NB which is very small. Please check & confirm.	The vent size indicated in the drawing is minimum requirement. The final size shall be decided based on the design calculation submitted by the successful bidder during detail engineering. Further bidder to note that Vent valves are not applicable as per GA drawing of tanks, bidder shall provide vent with suitable bird screen.
19	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Regarding baffle plates	Baffle plates are shown for all FGD tanks in the respective GA drawings. But from "schedule of baffle plates" given in the drawing "Typ. Arrangement of vertical mounted agitator, agitator platform and baffle plates" with drg.no. SKETCH-11, pg.498 of 500. we understood that baffle plates required for the tanks in which agitators are being installed. Hence we consider the baffle plates for those tanks indicated in the "schedule of baffle plates". Length of baffle plates given in "schedule of baffle plates" seems not correct. Kindly check & provide the corrected lengths.	Refer corrigendum -5 furnished earlier by BHEL.
20	SECTION-I / Sub Section-D / ANNEXURE-III (GA drawing for Miscellaneous FGD tanks)	---	---	Regarding Foundation bolts	There is a dimension "150 SQ" is indicated around the foundation bolt in the section-BB of Foundation loading drawings of FGD tanks. We understood that the same is referring to the dimension of the anchor pocket. Otherwise please specify what it is referring to.	Noted. However, Please refer corrigendum 5 for the revised Foundation Loading Drawings.
21	SECTION-III / ANNEXURE-8 (TYPICAL ARRANGEMENT OF VERTICAL MOUNTED AGITATOR & AGITATOR PLATFORM, BAFFLE PLATES)	498 of 500	---	---	The arrangement of agitator platform indicated in the referred typical drawing (Sketch-11) is not inline with arrangement shown (Refer plan detail) in the GA drawing of FGD tanks. However we consider agitator platform arrangement as given in the Sketch-11. Please confirm.	Noted and confirm. Please refer corrigendum -5 furnished earlier by BHEL Sletch-11.

22	SECTION-III / ANNEXURE-8 (TYPICAL ARRANGEMENT OF VERTICAL MOUNTED AGITATOR & AGITATOR PLATFORM, BAFFLE PLATES)	498 of 500	---	---	Agitator platform shall designed for dynamic loads of the agitator which can not be carried out by us. Hence please suggest the structural member sizes to be used for the agitator platform.	For dynamic load of the agitator, refer Annexure-1. Further the design of agitator platform along with the structural members shall be in bidder scope.
23	SECTION-II / Sub Section-A / STANDARD TECHNICAL SPECIFICATIONSMECHANICAL / GUIDANCE FOR DESIGNING AND FABRICATION OF STEEL CONSTRUCTIONS FOR RUBBER LINING	457 of 500	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 clarify.	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). Bidder to refer the Painting specification. Further outside of bottom surface of tanks shall have 2 Coats of High Build Coal Tar Epoxy suitably Pigmented, DFT:80-100 microns each Coat.
	SECTION-I / Sub Section-C2-C	392 of 500	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).		
24	Please refer Section - I, Sub Section C1-A (Specific Technical Requirement - Tanks), Page No. 52 of 500 in Technical specification (Part - 2) , Under Scope of supply 1.3 (b)			Inlet pipes shall be lined with replaceable wear resistant natural rubber lining of minimum 10 mm thickness	We have considered 6 mm thickness for the rubber lining of inlet pipes of size upto 500 NB. For Sizes 600 NB and above, we have considered 10 mm thick rubber lining	Inlet pipes shall be lined with replaceable wear resistant natural rubber lining of minimum 10 mm thickness. Further the Contractor can provide slurry pipes of size lower than 3" made up of FRP material (silicon carbide coating on slurry exposed surface) if it has previous experience of providing the same.
25	Please refer Section - I, Sub Section C1-A (Specific Technical Requirement - Tanks), Page No. 52 of 500 in Technical specification (Part - 2) , Under Scope of supply 1.3 (b)			The inlet pipes shall be lined with replaceable wear resistant natural rubber lining of minimum 10 mm thickness. Additional thickness of 2 mm in rubber lining shall be provided at bends.	We have considered 6 mm thickness for the rubber lining at bends of size upto 200 NB. For sizes 250 NB & above 12 mm thick rubber lining is considered	Inlet pipes shall be lined with replaceable wear resistant natural rubber lining of minimum 10 mm thickness. Further the Contractor can provide slurry pipes of size lower than 3" made up of FRP material (silicon carbide coating on slurry exposed surface) if it has previous experience of providing the same.
26					In general rubber lining is not considered in inner roof of tank. Kindly clarify if rubber lining is required in inner roof surface.	Bidder understanding is correct, Bidder to consider the rubber lining in inner roof of tank in line with the specification requirement.

AGITATOR LOADS (ANNEXURE-1)										
Sl.no.	Description	Primary Hydrocyclone feed tank	Filtrate water tank	Secondary Hydrocyclone feed tank	Waste water Tank	Limestone Slurry Storage tank	Auxiliary Absorbent Tank	Absorber Area Drain Pit	Gypsum Dewatering Area Drain Pits	Ball Mill Area Drain Pit
1	Tank Sl No.	1	2	3	4	5	6	10	11	12
2	Type of agitator	Vertical Type – (Center Mounted)	Vertical Type – (Center Mounted)	Vertical Type – (Center Mounted)	Vertical Type – (Center Mounted)	Vertical Type – (Center Mounted)	Marine Propeller – Horizontal Type (Side Entry),	Vertical Type – (Center Mounted)	Vertical Type – (Center Mounted)	Vertical Type – (Center Mounted)
	Dimension (in m)									
a)	Diameter	7.0	5.5	6.0	7.0	13.5	12.5	-	-	-
b)	Height	7.5	6.2	6.2	8.0	15.4	13.8	4 m(h) X 4m(w) X 4m (ht)	4 m(h) X 4m(w) X 4m (ht)	4 m(h) X 4m(w) X 4m (ht)
3	Quantity of Agitator per tank	1	1	1	1	1	3	1	1	1
4	Total no. of tanks	1	1	1	1	2	1	3	1	1
5	Loads									
a)	Static Load (assembly wt./agitator assembly) (in Tonnes)	2.3	0.98	0.98	2.3	5.8	1.35	0.5	0.5	0.5
b)	Dynamic load (per agitator assembly) (in Tonnes)	4.6	2.0	2.0	4.7	11.6	2.7	1.1	1.1	1.1
c)	Tentative Nozzle size for the each Agitator	350 NB	300 NB	300 NB	350 NB	500NB	200NB	150NB	150NB	150NB
Notes										
1 The loads and nozzle schedule furnished above is tentative and for tender purpose only. The final loads shall be furnished during detail engineering.										
2 The above details shall be read in conjunction with the GA drawing of tanks, tank schedule etc. furnished along with the technical specification.										

ANNEXURE-2

Material Specification FOR PIPE AND FITTING			
Item	Size	Thickness	Standard & Specification
PIPING	DN25 - DN50	Heavy	IS 1239 SML PE
	DN65 - DN150	Heavy	IS 1239 ERW BW
	DN200 - DN300	SCH20	IS 3589 Gr.410 ERW BE
	DN350 - DN400	SCH10	IS 3589 Gr.410 ERW BE
	DN450 - DN500	SCH10	IS 3589 Gr.410 ERW BE
	DN550 - DN1000	7.9T	IS 3589 Gr.410 ERW BE
	DN1100 - DN1200	9.5T	IS 3589 Gr.410 ERW BE
	DN1350 - DN1500	11.9T	IS 3589 Gr.410 ERW BE
	DN1600 - DN1800	12.7T	IS 3589 Gr.410 ERW BE
FITTING	DN25 - DN50	Suit to PIPE	BW A234-WPB ASME-B16.9
	DN65 - DN150	Suit to PIPE	BW A234-WPB ASME-B16.9
	DN200 - DN300	Suit to PIPE	BW A234-WPB ASME-B16.9
	DN350 - DN500	Suit to PIPE	BW A234-WPB ASME-B16.9
	DN550 - DN1000	Suit to PIPE	IS 2062 Gr.B (plate formed) ASME-B16.9
	DN1100 - DN1200	Suit to PIPE	IS 2062 Gr.B (plate formed) ASME-B16.9
	DN1350 - DN1500	Suit to PIPE	IS 2062 Gr.B (plate formed) —
	DN1600 - DN1800	Suit to PIPE	IS 2062 Gr.B (plate formed)
MITER BEND	> DN500	Suit to PIPE	IS 2062 Gr.B (plate formed)
FLANGE	DN25 - DN600		IS 2062 Gr.B (plate) SO FF ASME B 16.5 Cl.150
	DN650 - DN1800		IS 2062 Gr.B (plate) SO FF AWWA-C207 Cl.D