Project
Engineering
Management

Bharat Heavy Electricals Limited

(A Govt. Of India Undertaking)

Ref No.: PE/PG/PA1/E-6956/2022, Dt. 05/05/2022 **Date: 25.05.2022**

CORRIGENDA - 01

PROJECT: 3x800 MW PVUNL PATRATU TPP PHASE-I Project
PACKAGE: AGITATOR OF FGD SLURRY TANKS
TENDER ENQUIRY NO: PE/PG/PA1/E-6956/2022, Dt. 05/05/2022

TENDER DUE DATE: 02.06.2022 (2.00M)

Bidders to note following amendments w.r.t subject tender:

- ***Pls refer enclosed Annexure-1 for Technical Pre-Bid Clarification pertaining to subject tender.***

Bidders to ensure the submission of bid within the tender due date and time.

With Regards,
For & on behalf of BHEL

SHASHANK
SHEKHAR

Shashank Shekhar
Engineer/PG-III/BHEL-PEM

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PROJECT:3x800 MW PVUNL PATRATU TPP PHASE-I

PAKAGE: AGITATOR OF FGD SLURRY TANKS

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Pre-Bid Clarification

S.N	Section/Clause/Page No	Statement of the referred Clause	Clarification Required	BHEL Reply
1	Section II - Annexure-2 Mandatory Spares List Page 266-267 of 331	Spares quantity (bearing assembly and Belt&Pulley) given in TS are not matching with BOQ given, in TS 2 nos of each type and size given for this two Items. However, in BOQ it was given as 1 nos of each type and size only	Pls clarify the quantity for bearing assembly and Belt&Pulley under Mandatory Spares, we shall follow BOQ or List given TS	Spares quantity are clearly mentioned in Technical specification as well as in BOQ.However, it is reconfirmed that the qty for (bearing assembly) and (Belt & pulley) are "2 nos of each type & size"
2	Section C, Sub-Section-C1 4.0 - A) - 1 - x Page 36/331	Supporting arrangement including tie rods, gusset plates etc. of Side Entry Agitator on the tank Wall. Vessel Nozzle and mating flange for supporting on the tank wall , gaskets and fasteners	"Vessel Nozzle and mating flange" are excluded from supply scope, please confirm	Vessel Nozzle is excluded from bidder scope. However, the mating flange (agitator flange) including mountings are included in bidder scope of supply.
3	Section C, Sub-Section-C1 4.0 - A) - 1 - xii Page 36/331	Foundation plate with foundation bolts, vessel Nozzle	1. vessel Nozzle excluded from bidder supply scope. 2. Foundation plate with foundation bolts for fixing of the External Supports of side entry agitator shall be connected by welding with rebar of Absorber or Aux Tank foundation to ensure same settlement so as to avoid the impact on agitators, those IPs shall be imbeded during foundation construction, so design can be done by bidder, but supply to be excluded from Bidder scope, please confirm.	1. Noted. Vessel nozzle is excluded from bidder's scope. 2. Bidder to note that incase the side entry agitator supports needs to be connected by welding with the Aux Tank Foundation, the insert plates that needs to be embeded in the foundation shall be BHEL scope.
4	Section C, Sub-Section-C1 4.1 - IX Page 38/331	Static and dynamic (as far as applicable) balancing of all agitators shall be carried out after assembly.	Since the agitator impeller RPM is very low, Dynamic balance is not applicable and only static balance will be carried out. Further, in the NTPC Agitator Quality Plan (page 148/331) only static balance test if required. Pls confirm.	BHEL informed that the balancing (static/dynamic) shall be decided during detail engineering based on the applicable codes and standards furnished by the bidder and subject to NTPC approval. Bidder to comply.
5	Section C, Sub-Section-C1 4.1 - XXV Page 39/331	Bidder shall provide the design and arrangement of baffle plates in circular tanks.	Since Aux Absorbent Tank is designed with side entry, baffle design not applicable	Noted.
6	Section C, Sub-Section-C1 4.2 - A) - III Page 40/331	Although Agitator will have substantial low speed …. it is mandatory that rotating assembly shall be dynamically balanced to its rated speed.	Since the agitator impeller RPM is very low, Dynamic balance is not applicable and only static balance will be carried out. Pls confirm.	refer our reply at S.N.6 above.
7	Section C, Sub-Section-C1 4.2 - A) - Iv) Page 40 of 331	Impeller should be dynamically balanced to Gr: G16: ISO-1940 after rubber lining of shaft.	Since the agitator impeller RPM is very low, Dynamic balance is not applicable and only static balance will be carried out. Pls confirm.	refer our reply at S.N.6 above.
8	Section C, Sub-Section-C1 4.2 - B) - XI) Page 40 of 331	Seal life has to be guaranteed, taking into consideration all its components for 25000 hrs. If the seals fail before the completion of guaranteed period, the same should be replaced free of cost by the bidder.	As per Mechanical Seal OEM, the standard warranty given is only 8000hrs, so request to accept guarantee life as 8000hrs. However, actual working life under design condition can be expected up to or more than 25000hrs subject to strictly following up the O&M guidelines.	Noted. Same shall be discussed during engineering and shall be subjected to NTPC approval.
9	Section C, Sub-Section-C1 4.2 - B) -2 - Vertical Agitators for Other Slurry Tanks & Drain Pit Tanks - I Page 40 of 331	Agitator shall be supplied with stuffing box or any proven equivalent or superior sealing type. Construction of Gland Packing shaft seal system shall be as per the below fig:	Considering no pressure for slurry Tanks and drain pit, such requirement here Is not applicable. As per our current design for existing NTPC projects Skeleton Oil Seal will be used here. Further, on page 303 of 331 Annexure-8 Sl No.4 of Seal Type, same also mentioned as Not Required.	Type of sealing shall be discussed during engineering and shall be subjected to NTPC approval.
10	Section C, Sub-Section-C1 4.2 - H COUPLING & COUPLING GUARD) -VI Page 27 of 267	It is desirable that for servicing of seal, coupling half should not be removed. Coupling should be dynamically balanced to Gr: G6.3, ISO-1940.	Dynamic balance is not applicable and only static balance will be carried out.	refer our reply at S.N.6 above.
11	Section C, Sub-Section-C1 4.2 - L) - vII) Page 43 of 331	Impeller should be dynamically balanced to Gr: G16: ISO-1940 after rubber lining of shaft.	Since the agitator impeller RPM is very low, Dynamic balance is not applicable and only static balance will be carried out.	refer our reply at S.N.6 above.
12	Section C, Sub-Section-C1 9 INSPECTION AND TESTING - 7 Mechanical Run Test (in air) Page 51 of 331	Mechanical Run Test (in air) Each Agitator unit shall be given a 4-hour mechanical run test in air at vendor's shop. …….	1. The quantity of Agitator to be tested shall be as per approved MQP post order, but shall not be each agitator. 2. "4-hour mechanical run test in air" technically is not allowed.	Details of Mechanical run test for Agitators shall be discussed during deatiled engineering. All test shall be done in line with the QAP to be approved by customer during detailed engineering. Bidder to comply.

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Pre-Bid Clarification

13	Section C, Sub-Section-C1 9 INSPECTION AND TESTING - 8 Mechanical Run Test (in water) Page 51 of 331	Mechanical Run Test (in slurry of similar concentration as applicable for the project) Each agitator unit shall be given a load test in slurry at the vendor's shop. The duration of this test shall be 4 hours unless agreed otherwise…..	1. The quantity of Agitator to be tested shall be as per approved MQP post order, but shall not be each agitator. 2. Testing time will be 30 mins as per existing NTPC approved MQP, it will not be 4 hours 3. Testing slurry will be bidder's existing slurry inside the testing plateforms, slurry details can be provided before testing, but it will not be in slurry of similar concentration as applicable for the project	The Mechanical run test for Agitators shall be carried out with air/water along with other test requirement in line with the QAP to be approved by customer during detailed engineering. Bidder to comply.
14	Section C, Sub-Section-C1 9 INSPECTION AND TESTING - 8 Mechanical Run Test (in water) Page 51 of 331	c) Bearing housing vibrations. Maximum acceptable vibration velocity is 6 mm/sec.	Pls clarify the basis of such requirement or pls provide the standard/code	Bidder to follow the technical specification.
15	Section C, Sub-Section-C1 9 INSPECTION AND TESTING - 10.2.2 Page 52 of 331	Guaranteed Site vibration of the equipment…..as per ISO-10816 and 1.5-2.3mm/sec even if Motor rating falls below 15kw.	1. Pls clarify the cases if value below 1.5mm/sec for motor rating falls below 15kW. 2. Further, for motors above 15kW, the vibration is subject to the tank strength and rigidity, which are closely affecting the vibration	Bidder to follow technical specification. Further Any deviation to this requirement is subject to customer approval during detailed engineering based on applicable codes and standards to be furnished by the successful bidder during detail engineering.
16	Section I, Sub-Section-D Page 255-262 of 331	List of Makes of Sub-Vendor Items	Sub-vendor given for Motors, Paints etc, please confirm Bidder can used NTPC approved vendors beyond list, or propose its own vendors during DDE post order	Bidder has to submit the sub-vendor questionnaire provided with the specification in Section I, Sub-Section-C2B along with necessary credentials in case the successful bidder wants to propose its own sub-vendors during detail engineering. Further as mentioned in the technical specification, acceptance of makes shall be subjected to BHEL/ End customer acceptance during the detail engineering. Bidder to comply.
17	Section I, Sub-Section-D Annexure-8 Agitator Schedule Page 304of 331	Notes: 1. There shall be complete re-suspension of all solids after a 24 hour outage. Accumulation of solids shall not prevent agitator restart.	As per our project experience in case agitator outage: 1. If outage time is within 7 hours (i.e. before impeller being buried inside settlement), agitator can re-start again. 2. If outage time is expected beyond 7 hours, slurry level inside tank shall be reduced below Minimum Slurry Level to avoid impeller being buried inside settlement.	Bidder to follow technical specification requirement. However, agitator outage time / minimum slurry level shall be reviewed during detail engineering based on the industry practices / recommendation.
18	Section I, Sub-Section-D Annexure-8 Agitator Schedule Page 304 of 331	Notes: 4. Although the height of all tanks is fixed above, same may vary slightly during detailed engineering as per design calculation of tanks.	It is ok If tank height vary slightly. However, if beyond 200mm there will be commercial implications.	Noted. Bidder to consider the height of the agitator platform from the top of the tank as 1.0M inline with the technical specification.
19	Section I, Sub-Section-D Annexure-8 Agitator Schedule Page 304 of 331	Notes: 6.Bidder shall provide CFD analysis for establishing uniform suspension criteria. CFD shall be provided for Agitators for all the above tanks except drain pits. Further for Limestone slurry tank (total 2 no.) , CFD analysis shall be done only for one Agitatpr.	As per earlier project, CFD not required for Tanks & Sumps. If required for this project, bidder suggests to carry out one out of all above tanks since all agitators are same type of top entry. If all to be carried out, there will be more costs incurred.	CFD is applicable only in case the agitators offered are not of proven design.