



BHARAT HEAVY ELECTRICALS LIMITED  
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-15-Mar-22

CORRIGENDUM- 01

PROJECTs	:	2X500 MW NTPL TUTICORIN FGD
PACKAGE	:	COMPRESSED AIR SYSTEM
ENQUIRY NO	:	PE/PG/NTF/E-6902/2021 Dated 05-Mar-22
SUBJECT	:	TECHNICAL AMENDMENT + DUE DATE EXTENSION

Type of Corrigendum			
Technical Corrigendum -	<input checked="" type="checkbox"/>	Commercial Corrigendum -	<input checked="" type="checkbox"/>

Bidders are requested to go through the following -

1. Due date & time of bid submission has been extended upto 22.03.2022 @11:00 AM. Bid opening shall be done at 04:00 PM on the due date.
2. Refer attached Technical Amendment#1 to technical specification.

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

Digitally signed by UPENDRA CHAUDHARY  
DN: cn=UPENDRA CHAUDHARY, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=PROJECT ENGINEERING MANAGEMENT, email=upendra.choudhary@bhel.com, c=IN

Upendra Chaudhary  
Sr. Manager/BOP

	<b>Project :</b> <b>Air Compressor Package NTPL TUTICORIN - FGD (2 X 500 MW)</b>	<b>Technical Amendment #1</b>
	END USER : BHEL-NTPL TUTICORIN - FGD (2 X 500 MW)	
	EPC : BHEL	
	Specification No PE-TS-483-555-A001	

**PRELIMINARY- CLARIFICATION LIST**

Sr No	Clause No	Description	Bidder Clarification	BHEL Replies
1	Volume IIB; Section C1, Caluse 2.9	Access Platform for Receiver/Dryer	All instruments shall be mounted on Manheight for easy access , hence ladder is not required. Same is inline with previous executed projects with BHEL	Noted. However the equipment G.A.'s shall be reviewed and finalised during detail engineering and in case the instruments / valves are above manheight, access platform shall be provided.
2	Volume IIB; Section C1, Caluse 2.13	Commissioning Spares	For compressor & dryer are plug and play equipment. Separate Commissioning/Erection/Startup spares etc are not required for commissioning. Bidder is responsible for first commissioning of compressor.	Noted.
3	Volume IIB; Section C1, Caluse 2.18	Civil Work/Grouting	Civil work/Grouting etc not in bidder scope of work	Description against Clause no.specified by bidder is not correct , bidder to check the specification. Scope regarding civil work is clear in the specification, refer Exclusions.
4	Volume IIB; Section C1, Caluse 2.20	Hoses for O&M	Hoses for Operation & Maintenance is not required.	Description against Clause no.specified by bidder is not correct , bidder to check the specification.
5	Volume IIB; Section C1, Caluse 5.2 / 15.5	Cooling Water Pressure and Temp rise	3.5-4 Kg/cm2 Cooling water pressure at compressor inlet is require. Temp rise of cooling water is approx 9-10 deg Over cooling water inlet temperature. Air outlet temp from compressor is approx 9-10 deg above CW inlet temperature	Cooling water pressure shall be 4 - 6 kg/cm2(g). The cooling water inlet temp. shall be 38 deg. C. The compressed air outlet temperature from the system (compressor House) shall be 45 deg. C. Bidder to design the system accordingly.
6	Volume IIB; Section C1, Caluse 6.1	MCC/Switchgear in BHEL Scope	Bidder understand BHEL will provide DOL starter inlinw with recent executed FGD jobs	BHEL informed that as mentioned in electrical scope matrix provided in technical specification, DOL starter/Supply feeder shall be provided by BHEL for all the equipments pertaining to the compressed air system, based on the load list furnished during detail engineering by the successful bidder.
7	Volume IIB; Section C2A, Caluse 2.00.00	Codes & Standard	Mentioned codes and standard is generalised and bidder shall follow manufacturer design and testing standard as per previous executed Projects. Testing of compressor as per ISO 1217	BHEL Noted Testing standard of compressors as per ISO 1217.
8	Volume IIB; Section C2A, Caluse 5.00.00	PLC Based Compressor panel	Bidder shall offer microprocessor based controller for compressor and dryer inline with preious supply to various BHEL orders & which is suitable for application. In this tender caluse no Volume IIB; Section C2A, 7.03.00 also indicate acceptance of Microprocessor based controller.	Noted. Specifcaition calls for microprocessor based panels for compressors & air dryers.
9	Volume IIB; Section C2A, Caluse 5.01.04/ 6.15.00/ Annexure-I	HOC Type dryer	Bidder shall offer Totatry Single drum HOC type dryer. Design and construction of dryer as per bidder design which is proven for its performance. For such dryers filters are not requirie.	Rotary type HOC air dryer is acceptable to BHEL as already mentioned in specification, meeting the quality of air as specified.
10	Volume IIB; Section C2A, Caluse 6.08.00	Lubrication System	Lubrication system (coolers, pump etc) within compressor skid as per OEM standrad and proven for its performance. Auxillary Oil pump is not requirie for screw compressor	As per specifcaiton auxiliary motor driven oil pump is not a mandatory requirement and shall be supplied if required. As bidder confirms that the same is not required in their design the same is Noted.

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11	Volume IIB; Section C2A, Caluse 6.10.00; 6.17.00	Intercooler, aftercooler, Moisture separator,	Cooler design is critical for Equipment performance. To ensure require performance coolers within skid shall be as per OEM standrad design. Internal Design & Construction of Compressor & dryer shall be as per bidder standrad design & same is proven design for its performance & inline with earlier supplied equipments to various site of BHEL.	Noted. As already specified in the specificaiton that the design performance shall be in accordance with Manufacturer's Standard. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval
12	Volume IIB; Section C2A, Caluse 6.17.00	Solenoid Valves	Solenoid valves used within compressor /dryer skid as per OEM design	Noted. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval
13	Volume IIB; Section C2A, Caluse 7.00.00	Instrumentation witin compressor and dryer skid	Non Reduntant Instruments mounted on compressor & dryer skid shall be as per bidder standrad design & connected to Elektronikon (Microprocessor based controller) for controlling and monitoring of compressor and dryer. Gauges, Switches etc are not applicable within skid asper design. Screw Compressor works from 0-100% loading steps.	For instruments specificaiton requiriements shall prevail. However, BHEL noted bidder reply wrt screw compressors works on 0-100% loading steps.
14	Volume IIB; Section C2A, Caluse 7.05.00 / 7.06.00	Annunciation System	Control philisophy within compressor and dryer is as per bidder standrad philisophy to ensure safe & satisfactory performance of compressore and dryer. Same is inline with all BHEL projects executed. Internal paramaters available in controller can be transfrrred over softlink communcation for monitoring. Video indication is available on Microprocessor based controller.	Control philosophy shall be submitted by successful bidder for end customer approval during detail engineering. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval
15	Volume IIB; Section C2A, Caluse 8.00.00	Inspection & testing/ Quality Assurance	Inspection & testing of bidders equipment (compressor and dryer) shall be offered as per previous project executed with BHEL-NLC/TANGEDCO for various power plants. Confirmane certificate shall be provided for components within compressor and dryer. Final perfromance test (Flow , Pressure, Power Consumption etc) of compressor as per ISO 1217 can be witness by customer/TPI at bidders test bed. Volumetric efficiency/overall efficiency/filter efficiency etc cannot demonstarte at test bed and not requirer. Dryer dew point can be observed at site after dryer commissiong.	Inspection & testing clauses specified are very general. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval
16	Annexure-I	E-Cooling water quality Level gauge- Air receiver	Bidder requested to maintain PH between 6.8 to 8.5. For Dry air receivers Level gauge is not requirer.	DM watershall be provided as cooling water. Bidder's point on the level guage has been noted.
17	Volume IID; Section I, Caluse 8.00.00- Annexure-I	Interconnecting Piping	For compressed air application ERW pipes are acceptable. BHEL to reconfirm on on type of pipe ERW or seamless	Type of pipe for compressed air application shall be seamless in line with clause 2.0 (page 66 of 439) of technical specification.
18	Volume IIA; Section IV, Clause 4.00.00	Name Plates	Name Plate of Equipment is as per Bidder standrad design. Same is already covered basic information of equipment and inline with executed BHEL Jobs	BHEL Noted.
19	Volume IIA; Section IV, Clause 13.00.00;14.00.00	Packing Procedure	Bidder standard packing procedure shall be followed which will ensure safe delivery of material without damage to site. Same is followed in BHEL - NTPC Project	The packing procedure shall be as per specification. Specific constraints if any, shall be discussed during detailed engineering and shall be subjected to owner's approval

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20	Volume IIA; Section IV, Clause 19.00.00	Training To customer	Bidder considered 2 days site + classroom training for customer which is sufficient to understand operation of equipment. Additional days are chargeable.	Bidder's point regarding the training duration has been noted. However, the same shall be discussed with the successful bidder during detail engineering and finalized in mutual agreement with end customer.
21	Volume IIA; Section V	Protective Coating and Painting	Bidder standard painting procedure shall be followed for Bidder equipment which is followed in all BHEL Projects. Same is suitable for site environment	Noted. However same shall be suitable for sea environment and accordingly the painting shall be inline with the approved painting specification to be submitted by the successful bidder during detail engineering.
22	Volume IIA; Section VII	Quality Assurance requirement	Pages under this clause are not available in tender document.	Pl. refer page 156 of 439 onwards for Quality Assurance requirements.
23	Volume IIA; Section VIII	Requirement of spares, tools and tackles	This is general requirement mentioned under this clause for entire plant which is not applicable for Compressor package.	Noted. However, the same shall be provided in case applicable for compressor package
24	Volume II-F/Sec II, 2	CODES STANDARDS	Motor will be as per IS12615:2018 / IEC60034-1 Standards	The motor shall be as per technical specification. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval.
25	Volume II-F/Sec II, 3.03	For motor installed outdoor and exposed to direct sunrays, the effect of solar heat shall be considered in the determination of the design ambient temperature	We have offered motor as per customer requirement and ambient temperature hence no margin on the rating is considered.	Compressors are located inside Compressor house and are not exposed to direct sunlight.
26	Volume II-F/Sec II, 4.02	AC motor for VFD application	NOT APPLICABLE	Noted.
27	Volume II-F/Sec II, 4.03	D.C.motors	NOT APPLICABLE	Noted.
28	Volume II-F/Sec II, 5.02	Motors up to 1500kW - 600% subject to IS tolerance of plus 20%.	We have offered motor with starting current requirement as per NTPC requirement , if starting current 600% of FLC(sub to IS tolerance) required then offer will change.	The motor shall be as per technical specification.
29	Volume II-F/Sec II, 5.02.04	No of Starts	2 Hot , 3 Cold	Noted.
30	Volume II-F/Sec II, 5.04	Locked Rotor Withstand Time	Refer datasheet	Locked Rotor Withstand Time shall be as per technical specification.
31	Volume II-F/Sec II, 6.01.01	Enclosure	Degree of protection IP-55 offered, Motor will be mounted inside compressor Canopy.	Noted.
32	Volume II-F/Sec II, 6.01.02	For hazardous area approved type of increased safety enclosure shall be furnished.	NA , Safe area motor offered.	Noted.

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33	Volume II-F/Sec II, 6.06	BEARINGS	ANTIFRICTION BALL BEARINGS WITH L10 life of 40,000 hours OFFERED, Thrust bearings not offered please provide thrust details if any to check suitability of offered motor. Sealed bearings offered upto 250 frame size , regreasable bearings from 280 and above offered. Insulated bearing for 315 and above frame can be offered for VFD motors	The bearings shall be as per technical specification.
34	Volume II-F/Sec II, 6.07	Noise & Vibration	Motor vibration limits shall be as per IS 12075 and noise level shall be as per IS 12065	Noise & vibration shall be as per specification requirement.
35	Volume II-F/Sec II, 6.08.00	Motor Terminal Box	Terminal box will be as per ABB standard , Stud type terminal t-box offered. Please provide cable size to check suitability of offered terminal box. NTPC type terminal box offered	Motor terminal box shall be as per technical specification. The cable size shall be provided to the successful bidder during detail engineering .
36	Volume II-F/Sec II,	The terminal box shall be capable of withstanding maximum system fault current for a duration of 0.25 sec.	T-box suitable for fault level of 50KA for 0.25 sec	Pl. refer page 194 of 439 for confirmation on the same.
37	Volume II-F/Sec II, 6.09.00	Grounding	As per ABB Standards	Same shall be as per specification requirement. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval.
38	Volume II-F/Sec II, 6.10.00	Rating Plate	As per ABB Standards	Same shall be as per specification requirement. Specific constraints if any, shall be discussed during detailed engineering with customer and shall be subjected to owner's approval.
39	Volume II-F/Sec II, 7.04.00	Indicator/Switch	NOT APPLICABLE	Noted. BHEL understands the specification is clear regarding the requirement of Indicator / switch.
40	Volume II-F/Sec II, 7.1	Painting	Painting and painting procedure as per ABB standard	The painting of motor shall be suitable for sea environment and meeting the specification requirement.
41	Volume II-F/Sec II, 8.00.00	TESTS	As per ABB standard QAP	Bidder to follow specification requirement.
42	Volume II-F/Sec II, 9	DRAWINGS, DATA & MANUALS	As per ABB standard	Same shall be as per specification requirement.
43		DATA SHEET-A		Same shall be as per specification requirement.
44	DATA SHEET-A	11.0 Locked rotor current a) Limit as percentage of FLC : As per IS 12615	We have offered motor with starting current requirement as per NTPC requirement , if starting current 600% of FLC(sub to IS tolerance) required then offer will change.	Pl. refer our reply above on the same.
45	DATA SHEET-A	GENERAL TECHNICAL REQUIREMENTS FOR LV MOTORS		Same shall be as per specification requirement.
46	2	CODES AND STANDARDS	Motor will be as per IS12615:2018 / IEC60034-1	Same shall be as per specification requirement.
47	3.3	Starting Requirements	Refer datasheet	Same shall be as per specification requirement.
48	3.4	Running Requirements	Motor not suitable for 70% of 75% rated voltage	Same shall be as per specification requirement.
49	4.1	Outdoor motors shall be installed under a suitable canopy	Motor is mounted inside compressor canopy.	Noted.

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PRELIMINARY- CLARIFICATION LIST				
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50	4.7	Terminals and Terminal Boxes	Terminal box will be as per ABB standard , Stud type terminal t-box offered. Please provide cable size to check suitability of offered terminal box. T-box suitable for fault level of 50KA for 0.25 sec Cable Lugs not in ABB scope	Same shall be as per specification requirement. Cable lugs shall be provided by ACIL, if not by motor manufacturer.
51	4.9.6	Name plate with all particulars as per IS: 325 shall be provided	Nameplates as per ABB standard	Noted. However same shall be subjected to customer approval during detail engineering.
52	5	INSPECTION AND TESTING	Testing and Inspection as per ABB standard QAP	Pl. refer our reply above on the same.
53	6	DRAWINGS TO BE SUBMITTED AFTER AWARD OF CONTRACT	Documents as per ABB standard	Pl. refer our reply above on the same.
54	Annexure-A	cabling	Cabling within compressor and dryer skid as per bidder design	Cabling within the skid is noted as per bidder standard subjected to end customer approval during detail engineering.
55	Section C4	C&I	Filed Instruments shall be hooked up to common fieldmounted JB. Further cabling from JB to customer's PLC is in BHEL scope. Field instruments shall be mounted directly on pipeline inline with previous BHEL jobs. LIE/LIR is not applicable.	The scope of cabling shall be inline with the electrical scope matrix provided in the technical specification. Field instruments mounting shall be discussed and finalised during detail engineering, subjected to end customer approval.
56	Volume IIE; Section-I	FGD-PLC	FGD- PLC is not in bidder scope of supply	PLC herein refers to compressor and dryer microprocessor panel.
57	Volume IIE; Section-III Clause 4.14.00	Furniture	Furniture is not in bidder scope	Bidder to check, referred clause is not available in the technical specification.
58	Hardware Interface dia	Hardware Interface dia	For screw compressor vibration measurement is not require. Dryer Operation will be controlled through connected compressor	Specification is clear regarding hardware interface requirements. Dryer operation philosophy shall be discussed and finalised during detail engineering.
59	KKS Numbering	KKS Tag	KKS tagging shall be followed for parts outside compressor and dryer skid. Within skid bidder standard philosophy shall be followed inline with previous projects with BHEL	Noted.
60	Volume IIB; Annexure-I	Sub Vendor List/List of Makes	Internal components of Air Compressor & Air dryer - bidder approved source shall be followed. For Other items BHEL Approved source can be followed.	Noted.
61	Plant P&ID	Plant P&ID -HOC type dryer	Both receivers are Instrument Air, however in P&ID it is indicated one receiver as service air. There is PT & FCV indicated before receiver. BHEL to confirm purpose of this arrangement. If this require, PT signal shall be connected to Customer's PLC to operate FCV.	Bidder to check, referred clause is not available in the technical specification.
62	Volume IIB Section E- Annexure-IV	Site Storage & preservation	Site storage & preservation will be in BHEL scope. BHEL will release material during site mobilisation	Bidder to follow technical specification.
63	General	Local Control Panel	Internal Design of compressor & dryer's control panel which is part of equipment skid shall be as per Atlas Copco standard design & same is proven design for its performance & inline with earlier supplied equipments to various site of BHEL.	Noted. However,same shall be reviewed during detail engineering based on the documents furnished by the successful bidder.

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64	General	Special Tools & tackles	Special tools & tackles is not required. Hence not considred.	Noted. However, if found applicable during detail engineering, same shall be provided by bidder.
65	-	-	-	The technical specification specified by bidder at the header is not correct. Bidder to follow Technical Specification No.- PE-TS-483-555-A002 for the project tender.

Note : Only above mentioned Project Specifications are applicable.

Legend : C- Clarification, D-Deviation, I-Information