

CLAUSE 22. NTPC MOTOR

SPECIFICATION

TECHNICAL REQUIREMENTS



CLAUSE NO.	SPECIFICATION		TECHNICAL REQUIREMENTS		एनटीपीसी NTPC
MOTORS					
1.00.00	GENERAL REQUIREMENTS				
1.01.00	For the purpose of design of equipment/systems, an ambient temperature of 50 deg. Centigrade and relative humidity of 95% (at 40 deg C) shall be considered. The equipment shall operate in a highly polluted environment.				
1.02.00	All equipment's shall be suitable for rated frequency of 50 Hz with a variation of +3% & -5%, and 10% combined variation of voltage and frequency unless specifically brought out in the specification.				
1.03.00	Contactor shall provide fully compatible electrical system, equipment's, accessories and services.				
1.04.00	All the equipment, material and systems shall, in general, conform to the latest edition of relevant National and international Codes & Standards, especially the Indian Statutory Regulations.				
1.05.00	Paint shade shall be as per RAL 5012 (Blue) for indoor and outdoor equipment.				
1.06.00	The responsibility of coordination with electrical agencies and obtaining all necessary clearances for Contactors equipment and systems shall be under the Contactor scope.				
1.07.00	Degree of Protection				
	Degree of protection for various enclosures as per IEC60034-05 shall be as follows :-				
	i)	Indoor motors	-	IP 54	
	ii)	Outdoor motors	-	IP 55	
	iii)	Cable box-indoor area	-	IP 54	
	iv)	Cable box-Outdoor area	-	IP 55	
2.00.00	CODES AND STANDARDS				
	1)	Three phase induction motors	:	IS/IEC:60034	
	2)	Single phase AC motors	:	IS/ IEC:60034	
	3)	Crane duty motors	:	IS:3177, IS/IEC:60034	
	4)	DC motors/generators	:	IS:4722, IS/IEC:60034	
	5)	Energy Efficient motors	:	IS 12615, IEC:60034-30	
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4410-109-2		SUB SECTION-II-E2 MOTORS PAGE 1 OF 9	

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3.00.00	TYPE			
3.01.00	AC Motors:			
	a) Squirrel cage induction motor suitable for direct-on-line starting. b) Continuous duty LT motors upto 200 KW Output rating (at 50 deg.C ambient temperature), shall be Premium Efficiency class-IE3 , conforming to IS 12615, or IEC:60034-30. c) Crane duty motors shall be slip ring/ squirrel cage Induction motor as per the requirement. d) Motor operating through variable frequency drives shall be suitable for inverter duty. Also these motors shall comply the requirements stipulated in IEC: 60034-18-41 and IEC: 60034-18-42 as applicable.			
3.02.00	DC Motors	Shunt wound.		
4.00.00	RATING			
	(a) Continuously rated (S1). However, crane motors shall be rated for S4 duty, 40% cyclic duration factor. (b) Whenever the basis for motor or driven equipment ratings are not specified in the corresponding mechanical specification sub-sections, maximum continuous motor ratings shall be at least 10% above the maximum load demand of the driven equipment under entire operating range including voltage and frequency variations.			
5.00.00	TEMPERATURE RISE			
	Air cooled motors			
	70 deg. C by resistance method for both thermal class 130(B) & 155(F) insulation.			
	Water cooled			
	80 deg. C over inlet cooling water temperature mentioned elsewhere, by resistance method for both thermal class 130(B) & 155(F) insulation.			
6.00.00	OPERATIONAL REQUIREMENTS			
6.01.00	Starting Time			
6.01.01	For motors with starting time upto 20 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 2.5 secs. more than starting time.			
6.01.02	For motors with starting time more than 20 secs. and upto 45 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 5 secs. more than starting time.			
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6.01.03	For motors with starting time more than 45 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be more than starting time by at least 10% of the starting time.			
6.01.04	Speed switches mounted on the motor shaft shall be provided in cases where above requirements are not met.			
6.02.00	Torque Requirements			
6.02.01	Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.			
6.02.02	Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.			
6.03.00	Starting voltage requirement (a) Up to 85% of rated voltage for ratings below 110 KW (b) Up to 80% of rated voltage for ratings from 110 KW to 200 KW (c) Up to 85% of rated voltage for ratings from 201 KW to 1000 KW (d) Up to 80% of rated voltage for ratings from 1001 KW to 4000 KW (e) Up to 75 % of rated voltage for ratings above 4000KW			
7.00.00	DESIGN AND CONSTRUCTIONAL FEATURES			
7.01.00	Suitable single phase space heaters shall be provided on motors rated 30KW and above to maintain windings in dry condition when motor is standstill. Separate terminal box for space heaters & RTDs shall be provided. However for flame proof motors, space heater terminals inside the main terminal box may be acceptable.			
7.02.00	All motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type. However, motors rated 3000KW or above can be Closed air circuit water cooled (CACW). The method of movement of primary and secondary coolant shall be self-circulated by fan or pump directly mounted on the rotor of the main motor as per IEC 60034-6. However VFD driven motors can be offered with forced cooling type with machine mounted fan or pump driven by separate electric motor. Motors and EPB located in hazardous areas shall have flame proof enclosures conforming to IS:2148 as detailed below (a) Fuel oil area : Group – IIB (b) Hydrogen generation : Group - IIC or (Group-I, Div-II as per plant area NEC) or (Class-1, Group-B, Div-II as per NEMA /IEC60034)			
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4410-109-2	SUB SECTION-II-E2 MOTORS	PAGE 3 OF 9

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7.03.00	Winding and Insulation (a) Type : Non-hygroscopic, oil resistant, flame resistant (b) Starting duty : Two hot starts in succession, with motor initially at normal running temperature. (c) 11kV & 3.3 kV AC motors : Thermal class 155 (F) insulation. The winding insulation process shall be total Vacuum Pressure Impregnated i.e resin poor method. The lightning Impulse & interturn insulation surge withstand level shall be as per IEC-60034 part-15. (d) 240VAC, 415V AC & 220V DC motors : Thermal Class (B) or better			
7.04.00	Motors rated above 1000KW shall have insulated bearings to prevent flow of shaft currents.			
7.05.00	Motors with heat exchangers shall have dial type thermometer with adjustable alarm contacts to indicate inlet and outlet primary air temperature.			
7.06.00	Noise level for all the motors shall be limited to 85 dB(A) except for BFP motor for which the maximum limit shall be 90dB(A). Vibration shall be limited within the limits prescribed in IS:12075 / IEC 60034-14 . Motors shall withstand vibrations produced by driven equipment. HT motor bearing housings shall have flat surfaces, in both X and Y directions, suitable for mounting 80mmX80mm vibration pads.			
7.07.00	In HT motors, at least four numbers simplex / two numbers duplex platinum resistance type temperature detectors shall be provided in each phase stator winding. Each bearing of HT motor shall be provided with dial type thermometer with adjustable alarm contact and preferably 2 numbers duplex platinum resistance type temperature detectors.			
7.08.00	Motor body shall have two earthing points on opposite sides.			
7.09.00	11 KV motors shall be offered with Separable Insulated Connector (SIC) as per IEEE 386. The offered SIC terminations shall be provided with protective cover and trifurcating sleeves. SIC termination kit shall be suitable for fault level of 25 KA for 0.17 seconds.			
7.10.00	3.3 KV motors shall be offered with dust tight phase separated double walled (metallic as well as insulated barrier) Terminal box. Employer shall provide termination kit for the offered Terminal box. The offered Terminal Box shall be suitable for fault level of 250 MVA for 0.12 sec. Removable gland plates of thickness 3 mm (hot/cold rolled sheet steel) or 4 mm (non magnetic material for single core cables) shall be provided.			
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7.11.00	The spacing between gland plate & centre of terminal stud shall be as per Table-I.			
7.12.00	All motors shall be so designed that maximum inrush currents and locked rotor and pullout torque developed by them at extreme voltage and frequency variations do not endanger the motor and driven equipment.			
7.13.00	The motors shall be suitable for bus transfer schemes provided on the 11kV, 3.3 kV /415V systems without any injurious effect on its life.			
7.14.00	For motors rated 2000 KW & above, neutral current transformers of PS class shall be provided on each phase in a separate neutral terminal box.			
7.15.00	The size and number of cables (for HT motors) to be intimated to the successful Contactor during detailed engineering and the Contactor shall provide terminal box suitable for the same.			
8.00.00	The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any further tolerance):			
	(a) From 50KW & upto 110KW : 11.0			
	(b) From 110 KW & upto 200 KW : 9.0			
	(c) Above 200 KW & upto 1000KW : 10.0			
	(d) From 1001KW & upto 4000KW : 9.0			
	(e) Above 4000KW : 6 to 6.5			
10.00.00	TYPE TEST			
10.01.00	HT MOTORS			
10.01.01	The Contactor shall carry out the type tests as listed in this specification on the equipment to be supplied under this contract. The Contactor shall indicate the charges for each of these type tests separately in the relevant schedule of Section - VII- (BPS) and the same shall be considered for the evaluation of the bids. The type tests charges shall be paid only for the test(s) actually conducted successfully under this contract and upon certification by the Employer's engineer.			
10.01.02	The type tests shall be carried out in presence of the Employer's representative, for which minimum 15 days notice shall be given by the Contactor. The Contactor shall obtain the Employer's approval for the type test procedure before conducting the type test. The type test procedure shall clearly specify the test set-up, instruments to be used, procedure, acceptance norms, recording of different parameters, interval of recording, precautions to be taken etc. for the type test(s) to be carried out.			
10.01.03	In case the Contactor has conducted such specified type test(s) within last ten years as on the date of bid opening, he may submit during detailed engineering			
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	the type test reports to the Employer for waiver of conductance of such test(s). These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. The Employer reserves the right to waive conducting of any or all the specified type test(s) under this contract. In case type tests are waived, the type test charges shall not be payable to the Contactor.			
10.01.04	Further the Contactor shall only submit the reports of the type tests as listed in "LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED" and carried out within last ten years from the date of bid opening. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. However if the Contactor is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the Contactor shall conduct all such tests under this contract at no additional cost to the Employer either at third party lab or in presence of client/Employers representative and submit the reports for approval.			
10.01.05	LIST OF TYPE TESTS TO BE CONDUCTED The following type tests shall be conducted on each type and rating of HT motor (a) No load saturation and loss curves upto approximately 115% of rated voltage (b) Measurement of noise at no load. (c) Momentary excess torque test (subject to test bed constraint). (d) Full load test(subject to test bed constraint) (e) Temperature rise test at rated conditions. During heat run test, bearing temp., winding temp.,coolant flow and its temp. shall also be measured. In case the temperature rise test is carried at load other than rated load, specific approval for the test method and procedure is required to be obtained. Wherever ETD's are provided, the temperature shall be measured by ETD's also for the record purpose.			
10.01.06	LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED The following type test reports shall be submitted for each type and rating of HT motor (a) Degree of protection test for the enclosure followed by IR, HV and no load run test.			
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	(b) Terminal box-fault level withstand test for each type of terminal box of HT motors only. (c) Lightning Impulse withstand test on the sample coil shall be as per clause no. 4.3 IEC-60034, part-15 (d) Surge-withstand test on inter-turn insulation shall be as per clause no. 4.2 of IEC 60034, part-15			
10.02.00	LT Motors			
10.02.01	LT Motors supplied shall be of type tested design. During detailed engineering, the Contactor shall submit for Employer's approval the reports of all the type tests as listed in this specification and carried out within last <i>ten</i> years from the date of bid opening. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.			
10.02.02	However if the Contactor is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the Contactor shall conduct all such tests under this contract at no additional cost to the Employer either at third party lab or in presence of client/Employers representative and submit the reports for approval.			
10.02.03	LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED The following type test reports shall be submitted for each type and rating of LT motor of above 50 KW only 1. Measurement of resistance of windings of stator and wound rotor. 2. No load test at rated voltage to determine input current power and speed 3. Open circuit voltage ratio of wound rotor motors (in case of Slip ring motors) 4. Full load test to determine efficiency power factor and slip 5. Temperature rise test 6. Momentary excess torque test. 7. High voltage test 8. Test for vibration severity of motor. 9. Test for noise levels of motor(Shall be limited as per clause no 7.06.00 of this section)			
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	10. Test for degree of protection and 11. Overspeed test. 12. Type test reports for motors located in fuel oil area having flame proof enclosures as per IS 2148 / IEC 60079-1			
10.03.00	All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.			
10.04.00	The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and "No design Change". Minor changes if any shall be highlighted on the endorsement sheet.			
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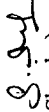
CLAUSE NO.	TECHNICAL REQUIREMENTS			एनटीपीसी NTPC																												
	TABLE - I DIMENSIONS OF TERMINAL BOXES FOR LV MOTORS <table><tr><th>Motor MCR in KW of</th><th>Minimum distance between centre stud and gland plate in mm As per manufacturer's practice.</th></tr><tr><td>UP to 3 KW</td><td></td></tr><tr><td>Above 3 KW - upto 7 KW</td><td>85</td></tr><tr><td>Above 7 KW - upto 13 KW</td><td>115</td></tr><tr><td>Above 13 KW - upto 24 KW</td><td>167</td></tr><tr><td>Above 24 KW - upto 37 KW</td><td>196</td></tr><tr><td>Above 37 KW - upto 55 KW</td><td>249</td></tr><tr><td>Above 55 KW - upto 90 KW</td><td>277</td></tr><tr><td>Above 90 KW - upto 125 KW</td><td>331</td></tr><tr><td>Above 125 KW-upto 200 KW</td><td>203</td></tr></table> For HT motors the distance between gland plate and the terminal studs shall not be less than 500 mm. PHASE TO PHASE/ PHASE TO EARTH AIR CLEARANCE: NOTE: Minimum inter-phase and phase-earth air clearances for LT motors with lugs installed shall be as follows: <table><tr><th>Motor MCR in KW</th><th>Clearance</th></tr><tr><td>UP to 110 KW</td><td>10mm</td></tr><tr><td>Above 110 KW and upto 150 KW</td><td>12.5mm</td></tr><tr><td>Above 150 KW</td><td>19mm</td></tr></table>				Motor MCR in KW of	Minimum distance between centre stud and gland plate in mm As per manufacturer's practice.	UP to 3 KW		Above 3 KW - upto 7 KW	85	Above 7 KW - upto 13 KW	115	Above 13 KW - upto 24 KW	167	Above 24 KW - upto 37 KW	196	Above 37 KW - upto 55 KW	249	Above 55 KW - upto 90 KW	277	Above 90 KW - upto 125 KW	331	Above 125 KW-upto 200 KW	203	Motor MCR in KW	Clearance	UP to 110 KW	10mm	Above 110 KW and upto 150 KW	12.5mm	Above 150 KW	19mm
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ANNEXURE-XI (SUB-VENDOR QUESTIONNAIRE)

LT MOTOR APPROVED VENDORS ARE GIVEN BELOW. MANUFACTURER HAS TO SUBMIT THE SUB VENDOR QUESTIONNAIRE IF THE MOTOR MANUFACTURER IS NOT AS PER THE LIST GIVEN BELOW

04	LT MOTORS	a) KEC c) CGL b) SIEMENS c) ABB a) BBL b) NGEF c) Marathon d) Jyoti e) LHP (For other PMD vendors except above NTPC approved vendors, pl refer Slno. 4 under important notes in page no:11)	Bangalore/Hubli (Up to 90KW) Ahmednagar Mumbai Faridabad up to 55KW/ Bangalore above 55KW Mumbai Hubli (up to 15KW) Kolkata Vadodara Solapur	Please refer remark column for Categorization Please refer remark column for Categorization	BAP/QR/ G501 & G502 /LTM:012 Rev NO: 00 dt 17 05 2018 ** Acceptance of Motor rating between 30KW to 50 KW is based on NTPC Review of Routine Test Inspection report as per IS 325 Witnessed by BHEL/BHEL AIA ie Main contractor along with COC of the manufacturer and the contractor confirming as follows: "It is hereby confirmed that the above mentioned motor was /motors were manufactured taking care of NTPC specific requirements regarding ambient temperature, voltage and frequency variation, hot starts , pull out torque, starting KVA/KW, temperature rise, distance between centre of stud and gland plate, space heater and in accordance with approved drawing /data sheets" ##Acceptance of Motor less than 30KW is based on COC of the manufacturer and the contractor conforming as follows: "It is here by confirmed that the above mentioned motor/motor was / were manufactured taking care of NTPC specific requirements regarding ambient temperature, voltage and frequency variation, hot starts , pull out torque, starting KVA/KW, temperature rise ,distance between centre of stud and gland plate and tested in accordance with approved drawing /data sheet".	Cat I Above 50 KW and up to 200KW NTPC inspn as per appd RQP/MQP Cat-II **From 30KW to 50KW BHEL Inspection # Cat-III Up to 30KW
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Prepared by: 
(Ch. Anil Singh)
Dy. Engineer/QA (Electrics)

Reviewed by: 
(S. Sheela)
Dy. Manager/QA (Electrics) & System

Approved by: 
(K. Gandhi Parimalam)
DGM / QA (Electrics)



**CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE**

i.	Item/Scope of Sub-contracting			
ii.	Address of the registered office	Details of Contact Person (Name, Designation, Mobile, Email)		
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)		
iv.	Annual Production Capacity for proposed item/scope of sub-contracting			
v.	Annual production for last 3 years for proposed item/scope of sub-contracting			
vi.	Details of proposed works			
1.	Year of establishment of present works			
2.	Year of commencement of manufacturing at above works			
3.	Details of change in Works address in past (if any)			
4.	Total Area			
	Covered Area			
5.	Factory Registration Certificate	Details attached at Annexure – F2.1		
6.	Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design Details attached at Annexure – F2.2 (if applicable)		
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)	Details attached at Annexure – F2.3		
8.	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.4		
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5		

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
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10.	Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing	Details attached at Annexure – F2.6								
11.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)	Details attached at Annexure – F2.7								
12.	Testing facilities (List of testing equipment)	Details attached at Annexure – F2.8								
13.	If manufacturing process involves fabrication then-	Applicable / Not applicable								
	List of qualified Welders	Details attached at Annexure – F2.9								
	List of qualified NDT personnel with area of specialization	(if applicable)								
14.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses	Applicable / Not applicable Details attached at Annexure. –F2.10 (if applicable)								
15.	Supply reference list including recent supplies	Details attached at Annexure – F2.11 (as per format given below)								
<i>Project/ package</i>	<i>Customer Name</i>	<i>Supplied Item (Type/Rating/Model /Capacity/Size etc)</i>								
		<i>PO ref no/date</i>								
		<i>Supplied Quantity</i>								
		<i>Date of Supply</i>								
16.	Product satisfactory performance feedback letter/certificates/End User Feedback	Attached at annexure - F2.12								
17.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) Note:- Reports need not to be submitted	Applicable / Not applicable Details attached at Annexure – F2.13 (if applicable)								
18.	Statutory / mandatory certification for the proposed product	Applicable / Not applicable Details attached at Annexure – F2.14 (if applicable)								
19.	Copy of ISO 9001 certificate (if available)	Attached at Annexure – F2.15								
20.	Product technical catalogues for proposed item (if available)	Details attached at Annexure – F2.16								
<table border="1"> <tr> <td>Name:</td> <td></td> <td>Desig:</td> <td></td> <td>Sign:</td> <td></td> <td>Date:</td> <td></td> </tr> </table>			Name:		Desig:		Sign:		Date:	
Name:		Desig:		Sign:		Date:				

Company's Seal/Stamp:-

Bharat Heavy Electricals Limited
Ranipet-632406, India
Quality Assurance

BAP:QA:M: 18-19
06.03.2019

Kind attn.: Shri. Ashish Kushwaha

DM/ Engg (FGD)

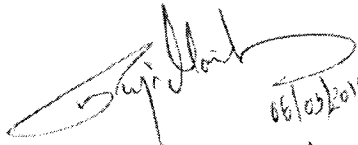
Item: Slurry pumps, Project: North Karanpura project (BAP Work order: G601-G603)

Quality department comments are as follows,

1. Slurry pumps are Sub-QR item, Quality plan approval can be obtained from M/s NTPC QA based on the receipt of Sub-QR clearance from NTPC Engg. FGD Engg is kindly requested to give the Sub-QR clearance details after their receipt so that we can take up with NTPC QA for QP approval.
2. Painting of Slurry pumps is as per approved painting schedule, extract of which is as follows and is indicative only. It may vary during the review by NTPC. Final painting schedule will be shared once we get approval from M/s NTPC.

Sl no	Surface preparation	Primer	Finish	Total
01	Power Tool Cleaning to St3 (SSPC-SP3)	Primer: Primer: Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) DFT- 30µ/coat DFT- 60µ Intermediate: One coat of Synthetic Enamel intermediate coat to IS 2932; DFT- 50µ/coat DFT-50µ	Finish: Two coats of Synthetic Enamel to IS 2932, DFT- 50µ/ coat DFT- 100µ Shade: Light blue RAL 5012	210µ

3. In case of order placed on foreign vendors, vendor has to finalize Inspection agency (List enclosed in Annexure A) at their own cost and carry out inspection as per the Quality plan and furnish us the inspection reports and other documents required as per approved Quality plan duly signed by the Inspection Agency after their witness for our review and acceptance.
4. We have attached Standard Quality plan on Slurry pumps. We wish to submit that attached SQP is indicative only. Stage inspection and Quantum of check may vary during final approval by customer (NTPC).


06/03/2019
RAJAMANI LAKSHMI
DI MAR/QA

Annexure-A

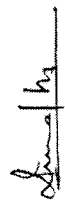
List of Third Party Inspection Agencies

Sl no	Name of Third Party Inspection Agency
01	M/s Bureau Veritas
02	M/s TUV- Nord
03	M/s TUV- SUD
04	M/s TUV Rheinland
05	M/s Lloyds Register
06	M/s SGS
07	M/s Germanischer Lloyds
08	M/s Quest
09	M/s Certification Engineers International
10	M/s Intertek
11	M/s IR class Systems and Solutions
12	Ms/ DNV


Rajamanickam. M
Dy. Manager
QA

STANDARD QUALITY PLAN														
MANUFACTURER'S NAME AND ADDRESS			ITEM: SLURRY PUMP SYSTEM: FGD											
M/S BHEL: BAP: RANIPET 632 406 TAMIL NADU			Q.P. NO: FGS:724											
Ranipet			REV. NO: 00											
			DATE: 12.02.2019											
			PAGE NO: Page 1 of 3											
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY	REMARKS		
1.	2.	3.	4.	5.	M	C/N	7.	8.	9.	D*	M	C	N	11.

1.0 RAW MATERIAL											
1.1	a) Volute Casing b) Wear Plate c) Impeller	Chemical & mechanical properties	Major	Composition analysis & mechanical properties test	1 Per Heat No	Approved GA Drawing / Data Sheet	Raw Material TC/COC	V	P	V	Tensile Test Is Applicable For Volute Casing Only.
1.2	Shaft	1) Chemical Composition 2) Mechanical Properties	Major	Composition analysis & mechanical properties test	1 Per Heat No	Approved GA Drawing / Data Sheet	Material Test Report	V	P	V	
		UT Test	Major	NDT	100%	ASTM A 388	ASME Sec V	V	P	V	Shafts Ø40mm are UT tested.
2.0 IN PROCESS INSPECTION											
2.1	Impeller	Surface Defect	Major	DPT on machined surfaces	100%	ASTM E 165	ASME Sec V	V	P	V	
	Shafts after machining	Surface Defect	Major	DPT	100%	ASTM E 165	ASME Sec V	V	P	V	
2.2	Impeller & Shaft	Residual Unbalance	Major	Static & Dynamic Balancing	100%	Relevant Standard/ISO 1940 Gr 2.5	Insp Report	V	P	V	
2.3	Casing	Soundness	Major	Hydrostatic test	100%	No leakage	Insp Report	V	P	V	At 200% Of Pump Rated

LEGEND: * RECORD, IDENTIFIED WITH "TICK" (✓) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A QA DOCUMENTATION PACKAGE. M: MANUFACTURER / SUB SUPPLIER, C: MAIN CONTRACTOR. N: CUSTOMER/CONSULTANT P: PERFORM W: WITNESS V: REVIEW OF RECORDS MA: MAJOR AND MI: MINOR		PREPARED BY  Rakesh Kumar Madhu, (SEr/QA)	REVIEWED & APPROVED BY  K C Gandhi Parimalam, (DGM/QA)
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STANDARD QUALITY PLAN										
MANUFACTURER'S NAME AND ADDRESS				ITEM: SLURRY PUMP SYSTEM: FGD						
M/S BHEL: BAP: RANIPET 632 406 TAMIL NADU				QP NO: FGS:724 REV. NO: 00 DATE: 12.02.2019 PAGE NO: Page 2 of 3						
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY M C N	REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	11.
										Head Or 150% Of Shut Off Head, Whichever Is Higher, for at least 30min.
2.4	Motor	Make, Type, Rating	Major	Visual	100%	Approved Drawing / Data Sheet		Routine Test Report/COC	P V V	Motor Up to 30kw COC Will Be Provided.
3.0 FINAL INSPECTION										
3.1	Complete Pump	Dimensions	Major	Measurement & Visual	100%	Manufacturer Drawing		Inspection Report	P W W	
3.2	Performance Test	1)Flow, Head, Efficiency, BHP at Rated Speed 2)Vibration and Noise Level 3)Leakage Test	Major	Measurement & Visual	100%	Approved Drawing / Data Sheet		Inspection Report	P W W*	
		Strip Down Test Not Required If Performance Test Is Fine	Major	Visual	100%	Mfg. Drawing, Approved Data Sheet			P W W	Only Required in Case of Abnormal Sound

LEGEND: * RECORD, IDENTIFIED WITH "TICK" (✓) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A QA DOCUMENTATION PACKAGE. M: MANUFACTURER / SUB SUPPLIER, C: MAIN CONTRACTOR. N: CUSTOMER/CONSULTANT P: PERFORM W: WITNESS V: REVIEW OF RECORDS MA: MAJOR AND MI: MINOR	PREPARED BY  Rakesh Kumar Madhu, (SER/ QA)	REVIEWED & APPROVED BY  K C Gandhi Parimalam, (DGM/ QA)
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MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN											
 Ranipet M/S BHEL: BAP: RANIPET 632 406 TAMIL NADU		ITEM: SLURRY PUMP		QP NO		FGS:724							
		SYSTEM: FGD		REV. NO:		00							
				DATE:		12.02.2019							
				PAGE NO:		Page 3 of 3							
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS	
					M	C/N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	10.		11.	
3.3	Painting Check	DFT, Paint Shade	Major	Measurement And Visual	100%	Rando m	Approved Painting scheme		Insp Report	✓	P	W	V
													Quality Dossier To Be Submitted Finally.

NOTE:

1. For Slurry Pump Motor Rating is 37KW and motor make NTPC/BHEL Approved source.
2. Routine test report duly witnessed by main contractor as per applicable standard shall be reviewed during inspection (more than 30KW Rating).

LEGEND: * RECORD, IDENTIFIED WITH "TICK" (✓) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A QA DOCUMENTATION PACKAGE.	PREPARED BY	REVIEWD & APPROVED BY
M: MANUFACTURER / SUB SUPPLIER, C: MAIN CONTRACTOR. N: CUSTOMER/CONSULTANT P: PERFORM W: WITNESS V: REVIEW OF RECORDS MA: MAJOR AND MI: MINOR	 Rakesh Kumar Madhu, (SEr/QA)	 K C Gandhi Parimalam, (DGM/QA)

ANNEXURE-I QUALIFICATION REQUIREMENT

CLAUSE NO.	INTENT OF SPECIFICATION																		
	TERMINOLOGY TO BE FOLLOWED FOR ANNEXURE-I: BIDDER MEANS: BHEL BIDDER'S SUB VENDOR: SLURRY PUMP MANUFACTURER																		
4.00.00	QUALIFYING REQUIREMENTS FOR EQUIPMENTS/SYSTEMS																		
4.01.01	Provenness criteria for critical equipment, auxiliaries, systems and bought out items: The Bidder / Bidder's sub-vendor(s) is required to meet the provenness criteria and/or qualification requirement for critical equipment, auxiliaries, system and bought out items as per criteria stipulated below:																		
4.01.02	Booster Fans, Slurry Recirculation Pumps, Oxidation Blowers, Wet Limestone Grinding Mills, Slurry Pumps, Agitators & Vacuum Belt Filters for the Wet Limestone based Flue Gas Desulphurisation (FGD) System offered by the Bidder shall be only from such manufacturer(s) who has previously designed (either by itself or under collaboration / licensing agreement), manufactured / got manufactured the respective equipment(s) of the type, application and minimum equipment rating as stipulated below such that the respective equipment(s) should have been in successful operation in at least one (1) plant for a period not less than one(1) year reckoned as on the date of consideration for approval but not later than 31.01.2019: <u>Type and Rating for Qualification</u> <table><tr><th>Sl. No.</th><th>Name of Equipment</th><th>Type of Equipment</th><th>Application</th><th>Equipment Rating</th></tr><tr><td>(a)</td><td>Booster Fans</td><td>Axial type with variable pitch control</td><td>Coal fired power plant</td><td>80% of the flow & 100% of the head of the offered Booster Fan with Fan Speed 900 rpm (maximum)</td></tr><tr><td>(b)</td><td>Slurry Recirculation Pumps</td><td>Centrifugal type</td><td>Wet Limestone based FGD application in Coal fired power plant</td><td>80% of the flow & 100% of the head of the offered Slurry Recirculation Pump</td></tr></table>				Sl. No.	Name of Equipment	Type of Equipment	Application	Equipment Rating	(a)	Booster Fans	Axial type with variable pitch control	Coal fired power plant	80% of the flow & 100% of the head of the offered Booster Fan with Fan Speed 900 rpm (maximum)	(b)	Slurry Recirculation Pumps	Centrifugal type	Wet Limestone based FGD application in Coal fired power plant	80% of the flow & 100% of the head of the offered Slurry Recirculation Pump
Sl. No.	Name of Equipment	Type of Equipment	Application	Equipment Rating															
(a)	Booster Fans	Axial type with variable pitch control	Coal fired power plant	80% of the flow & 100% of the head of the offered Booster Fan with Fan Speed 900 rpm (maximum)															
(b)	Slurry Recirculation Pumps	Centrifugal type	Wet Limestone based FGD application in Coal fired power plant	80% of the flow & 100% of the head of the offered Slurry Recirculation Pump															
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4410-109-2		SUB-SECTION-I INTENT OF SPECIFICATION PAGE 8 OF 18															

CLAUSE NO.	INTENT OF SPECIFICATION					
	Sl. No.	Name of Equipment	Type of Equipment	Application	Equipment Rating	
	(c)	Oxidation Blowers	Centrifugal/ positive displacement type blower	Wet Limestone based FGD application in Coal fired power plant	80% of the flow & 100% of the head of the offered Oxidation Blower	
	(d)	Wet limestone Grinding mills	Horizontal Wet Ball mill	Wet Limestone based FGD application in Coal fired power plant	80% of the offered Ball mill capacity with pulverizing fineness not less than 90% thru 325 mesh	
	(e)	Slurry Pumps	Centrifugal type	Wet Limestone based FGD application or ash slurry application in Coal fired power plant	80% of the flow & 100% of the head of the offered Slurry Pump(s)	
	(f)	Agitators	Vertical/Horizontal	Wet Limestone based FGD application in Coal fired power plant	Agitator rating not less than that supplied for 500 MW or higher size unit for similar application	
	(g)	Vacuum Belt filters	Belt type	Wet Limestone based FGD application in Coal fired power plant	80% of the offered Vacuum Belt filter capacity	
4.01.03	Bidder shall offer and supply only the type of the above equipment(s) for which he himself or the manufacturer proposed by the bidder for the above equipment(s) is qualified. The provenness criteria for equipment (Booster Fans) stipulated at Sl. No. 4.01.02(a) above shall also be considered acceptable provided the rating parameters (i.e., flow, head and rated rpm) is covered within the operating regime of the respective fan performance curve of the reference plant equipment. In case the Bidder or the proposed sub-vender is not manufacturer of proven Booster Fans as per clause 1.2(a) above but is a manufacturer of such equipment for units of at least 500 MW rating, the Bidder or the proposed sub-vender can manufacture such equipment for 660 MW units also, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such					
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4410-109-2		SUB-SECTION-I INTENT OF SPECIFICATION	PAGE 9 OF 18	

CLAUSE NO.	INTENT OF SPECIFICATION			
4.01.04	equipment in India with such manufacturer who meet the requirements stipulated at clause 4.01.02(a) above for the Booster Fans. A JV / Subsidiary Company formed for manufacturing and supply of equipment(s) as listed at clause no. 4.01.02 above in India, can also manufacture such equipment(s), provided that it has a valid collaboration or licensing agreement for design, engineering, manufacturing of such equipment(s) in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 4.01.02 above (or the technology provider of the qualified equipment manufacturer) for the respective equipment(s). However, in this case, the proposed JV / Subsidiary Company before resorting to design, engineering, manufacturing of such proven equipment(s) listed at clause no. 4.01.02 above by himself should have sourced / shall source such proven equipment(s) for at least the first 660 MW unit completely from such qualified manufacturer. For subsequent units before taking up the manufacturing of such equipment(s), the bidder/ his sub-vendor(s) must create /have created manufacturing facilities at his works as per collaborator's/licensor's design, manufacturing and quality control system for such equipment(s). Further, in such a case, such qualified equipment manufacturers should have, directly or indirectly through its holding company/ subsidiary company, at least 26% equity participation in the Indian Joint Venture Company/ Subsidiary Company, which shall be maintained for a lock-in period of seven (7) years from the date of incorporation of such Joint Venture/ Subsidiary or upto the end of defect liability period of the contract, whichever is later. In addition, the Bidder along with the Indian Joint Venture Company/ Subsidiary Company, qualified equipment manufacturers and its holding/ subsidiary Company, as applicable, shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed in the bidding document. The DJU shall be submitted prior to the placement of order on the approved sub-vendor for a particular equipment. In case of award, each executant of the DJU except the Bidder shall be required to furnish an on demand bank guarantee for INR 1.5 Million (Indian Rupees One and Half Million only) for each equipment.			
4.01.05	In case the Bidder or the proposed sub-vendor is not manufacturer of proven Oxidation Blowers as per clause 4.01.02(e) above but is a manufacturer of Blowers/compressors for minimum 50 NM³/min capacity, the Bidder or the proposed sub-vendor can also manufacture Oxidation Blowers, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such Oxidation Blowers in India with such manufacturer who meet the requirements stipulated at clause 4.01.02(e) above for the Oxidation Blowers. However, in this case, Bidder or the proposed sub-vendor before resorting to design, engineering, manufacturing of such proven equipment by himself should have sourced / shall source such proven equipment for at least the first 660 MW unit completely from such qualified manufacturer. For subsequent units before taking up the manufacturing of such equipment, the bidder/ his sub-vendor must create /have created manufacturing facilities at his works as per collaborator's /licensor's design, manufacturing and quality control system for such equipments.			
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4410-109-2	SUB-SECTION-I INTENT OF SPECIFICATION	PAGE 10 OF 18

CLAUSE NO.	INTENT OF SPECIFICATION	एनटीपीसी NTPC	
4.01.06	In addition, the Bidder along with the qualified equipment manufacturer shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed in the bidding document. The DJU shall be submitted prior to the placement of order on the approved sub vendor for Oxidation Blowers. In case of award, each executant of the DJU except the Bidder shall be required to furnish an on demand bank guarantee for INR 1.5 Million (Indian Rupees One and Half Million only). In case the Bidder or the proposed sub vendor is not manufacturer of proven Wet limestone Grinding mills as per clause 4.01.02(d) above but is a manufacturer of dry Grinding mills for power or cement industry of minimum 20 T/h capacity, the Bidder or the proposed sub vendor can also manufacture Wet limestone Grinding mills, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such Wet limestone Grinding mills in India with such manufacturer who meet the requirements stipulated at clause 4.01.02(d) above for the Wet limestone Grinding mills. However, in this case, Bidder or the proposed sub vendor before resorting to design, engineering, manufacturing of such proven equipment by himself should have sourced / shall source such proven equipment for at least the first 660 MW unit completely from such qualified manufacturer. For subsequent units before taking up the manufacturing of such equipment, the bidder/ his sub vendor must create /have created manufacturing facilities at his works as per collaborator's /licensor's design, manufacturing and quality control system for such equipments. In addition, the Bidder along with the qualified equipment manufacturer shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed in the bidding document. The DJU shall be submitted prior to the placement of order on the approved sub vendor for Wet limestone Grinding mills. In case of award, each executant of the DJU except the Bidder shall be required to furnish an on demand bank guarantee for INR 1.5 Million (Indian Rupees One and Half Million only).		
	4.01.07 In case the Bidder or the proposed sub vendor is not manufacturer of proven Agitators as per clause 4.01.02(f) above but is a manufacturer of Agitators for similar process/duty application in petrochemical or metals and mining industry, the Bidder or the proposed sub vendor can also manufacture Agitators, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such Agitators in India with such manufacturer who meet the requirements stipulated at clause 4.01.02(f) above for the Agitators. However, in this case, Bidder or the proposed sub vendor before resorting to design, engineering, manufacturing of such proven equipment by himself should have sourced / shall source such proven equipment for at least the first 660 MW unit completely from such qualified manufacturer. For subsequent units before taking up the manufacturing of such equipment, the bidder/ his sub vendor must create /have created manufacturing facilities at his works as per collaborator's /licensor's design, manufacturing and quality control system for such equipments. In addition, the Bidder along with the qualified equipment manufacturer shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the		
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4410-109-2	SUB-SECTION-I INTENT OF SPECIFICATION	PAGE 11 OF 18

CLAUSE NO.	INTENT OF SPECIFICATION			
4.01.08	successful performance of the equipment as per the format enclosed in the bidding document. The DJU shall be submitted prior to the placement of order on the approved sub vendor for Agitators. In case of award, each executant of the DJU except the Bidder shall be required to furnish an on demand bank guarantee for INR 1.5 Million (Indian Rupees One and Half Million only). In case the Bidder or the proposed sub-vendor is a manufacturer of Slurry Pumps who meets the requirements stipulated at clause 4.01.02(e) above, the Bidder or the proposed sub-vendor can also manufacture Slurry Recirculation Pumps, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such equipment in India with such manufacturer who meet the requirements stipulated at clause 4.01.02(e) above for the Slurry Recirculation Pumps. However, in this case, Bidder or the proposed sub-vendor before resorting to design, engineering, manufacturing of such proven equipment by himself should have sourced / shall source such proven equipment for at least the first 660 MW unit completely from such qualified manufacturer. For subsequent units before taking up the manufacturing of such equipment, the bidder/ his sub-vendor must create /have created manufacturing facilities at his works as per collaborator's /licenser's design, manufacturing and quality control system for such equipment. In addition, the Bidder along with the qualified equipment manufacturer shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed in the bidding document. The DJU shall be submitted prior to the placement of order on the approved sub-vendor for Slurry Recirculation Pumps. In case of award, each executant of the DJU except the Bidder shall be required to furnish an on demand bank guarantee for INR 1.5 Million (Indian Rupees One and Half Million only).			
4.01.09	Before taking up the manufacturing of such equipment(s) as per clause 4.01.03, 4.01.04, 4.01.05, 4.01.06, 4.01.07 & 4.01.08 above, the Bidder / its sub vendor(s) must create (or should have created) manufacturing and testing facilities at its works as per Collaborator / licensor's design, manufacturing and quality control system for such equipments duly certified by the Collaborator / licensor. Further, the Collaborator / Licensor shall provide (or should have provided) all design, design calculation, manufacturing drawings and must provide (or should have provided) technical and quality surveillance assistance and supervision during manufacturing, erection, testing, commissioning of equipments.			
4.01.10	Bidder shall offer and supply only the type of the above equipment(s) for which it, itself or the manufacturer / Collaborator(s) / Licensor(s) proposed by the Bidder for the above equipment(s) is qualified.			
4.01.11	The Employer reserves the right to fully satisfy himself regarding capability and capacity of Bidder / its sub-vendor(s) and the proposed arrangement and may prescribe additional requirement before allowing manufacture of the equipment listed above for this contract.			
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4410-109-2	SUB-SECTION-I INTENT OF SPECIFICATION	PAGE 12 OF 18

CLAUSE NO.	INTENT OF SPECIFICATION			एनटीपीसी NTPC
	Note to clause 4.01.02 (1) Whenever the term 'coal fired' is appearing above, "Coal" shall be deemed to also include bituminous coal/brown coal/lignite.			
NORTH KARANPURA SUPER THERMAL POWER PROJECT (3X660 MW) FLUE GAS DESULPHURISATION SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-A BID DOC. NO CS-4410-109-2		SUB-SECTION-I INTENT OF SPECIFICATION PAGE 13 OF 18

FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE
FOR
NORTHKARANPURA STPP (3X660 MW)
BIDDING DOCUMENT NO. CS-4410-109-2

Bidder's Name and Address:

To
Contract Services-II
NTPC Limited
Noida-201301

Summary of Critical Equipment indicated under clause 4.01.00, sub-section-I, Part-A of Section-VI.

Equipment Name	Sub-Vendor Name	Collaborator's Name, if applicable	Seeking Qualification as per clause..... Sub-Section-I, Part-A of Section-VI
Booster Fans			*4.01.01/*4.01.02/*4.01.03/*4.01.04
*Slurry Recirculation Pumps			*4.01.01/*4.01.02/*4.01.04/*4.01.08
Oxidation Blowers			*4.01.01/*4.01.02/*4.01.04/*4.01.05
Wet limestone Grinding mills			*4.01.01/*4.01.02/*4.01.04/*4.01.06/
Slurry Pumps			*4.01.01/*4.01.02/*4.01.04/*4.01.08
Agitators			*4.01.01/*4.01.02/*4.01.04/*4.01.07
Vacuum Belt filters			*4.01.01/*4.01.02/*4.01.04

Note : *Strike-off whichever is not applicable.

1. If qualification sought as per clause 4.01.01, sub-section-I-A, Part-A of Section-VI then the details of the sub vendor (manufacturer) shall be filled by the bidder in the format A to G.

Signature of authorized signatory.....

2. If the qualification sought as per the clause 4.01.03, sub-section-I-A, Part-A of Section-VI, then the details of proposed sub vendor (i.e manufacturer of such equipments for at least 500 MW unit rating) shall be filled individually by the bidder in the format A and the details of collaborator who meets the requirement stipulated at 4.01.02, sub-section-I-A, Part-A of Section-VI shall also be filled by the bidder in the format A separately. Further, in case of qualification vide clause 4.01.02, sub-section-I-A, Part-A of Section-VI a copy of valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing, supply of such equipment in India with the collaborator who meets the requirement stipulated at 4.01.02, sub-section-I-A, Part-A of Section-VI shall also be furnished.
 3. If the qualification sought as per the clause 4.01.04, sub-section-I-A, Part-A of Section-VI then the details of JV/Subsidiary Company formed for manufacturing of such equipments in India shall be furnished individually for each equipment by the bidder such as,
 - i) Copy of document of incorporation of JV/Subsidiary company in India
 - ii) Copy of valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing, supply of such equipment in India with the collaborator who meets the requirement stipulated at 4.01.02, sub-section-I-A, Part-A of Section-VI.
 - iii) Copy of document of at least 26% equity participation of qualified equipment manufacturer in the Indian JV company/subsidiary company directly or indirectly through its holding company /Subsidiary company, which shall be maintained for a lock -in period of seven (7) years from the date of incorporation of such JV/subsidiary or up to the end of defect liability period of the contract which ever is later.
- Further, the details of collaborator or technology provider of the qualified equipment manufacturer who meets the requirement stipulated at 4.01.02, sub-section-I-A, Part-A of Section-VI shall be filled by the Bidder in the format A to G (format given at 1.00.00). In addition to that, the sub vendor along with the Indian JV company/subsidiary company, qualified equipment manufacturer and its holding company/subsidiary company as applicable shall furnish the DUJ.

*** strike out whichever is not applicable.**

1.00.00

(Applicable for Bidder/his sub vendors seeking qualification as per clause no. 4.01.02, Sub section-I, Part-A of Section-VI. Bidder shall furnish the required data only for those equipments / auxiliaries which are proposed to be sourced under this route.)

We, hereby furnish the data on proveness criteria for critical equipment, auxiliaries, systems and Bought Out Items such as Booster Fans, Slurry Recirculation Pumps, Oxidation Blowers, Wet Limestone Grinding Mills, Slurry Pumps, Agitators & Vacuum belt filters which have been designed (either by self manufacturer or under valid ongoing collaboration and technology transfer agreement), *manufactured/ *got manufactured and supplied by us /Manufacturer (or manufacturer/ got manufactured & supplied by our proposed sub-vendors) and these are in successful operation in at least one (1) plant for a period not less than one year reckoned

Signature of authorized signatory.....

as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder. The details of type and minimum equipment rating of such equipment are given below :

A: ~~For Booster Fans: We declare that, we/our Sub-Vender, have designed (either by itself or under collaboration / licensing agreement), *manufactured/*got manufactured and supplied at least one (1) number of Booster Fan of minimum 80% of the flow & 100% of the head of the offered Booster Fan with Fan Speed 900 rpm (maximum), Axial type with variable pitch control working in a Coal fired power plant and which has been in successful operation for minimum one(1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:~~

Sl. No.	Description	Reference Work
1:	Name of the reference plant & location:	
2:	Client name and his address:	
3:	No. of units and capacity in MW of unit:	
4:	Whether equipment operating in a coal fired power plant	*Yes/No
5:	Name of equipment manufacturer & address:	
6:	Date of commission of the equipments:	
7:	Model no. of the equipment:	

Signature of authorized signatory:

Sl. No.	Description	Reference Work
8:	Brief Technical particulars of the equipments:	
9:	Flow—	m ³ /Sec with
10:	Head—	mmWC &
11:	Fan Speed—	rpm
12:	Whether the equipment(s) are in successful operation in at least one(01) plant for a period not less than one (01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	—*Yes/*No
13:	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment-3K
14:	Performance details:	*Certificate/*Letter/*E-mail/*Performance Curve from End user enclosed at Annexure.....to Attachment-3K

~~*Strike off whichever is not applicable.~~

Signature of authorized signatory.....

B. ~~Slurry Recirculation Pumps: We declare that, we/our Sub-Vendor, have designed (either by itself or under collaboration / licensing agreement), *manufactured/*got manufactured and supplied at least one (1) number of Slurry Recirculation Pumps of minimum 80% of the flow & 100% of the head of the offered Slurry Recirculation Pump, Centrifugal type working in a Wet Limestone-based FGD application in Coal fired power plant and which has been in successful operation for minimum one (1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:~~

Sl. No.	Description	Reference Work
1:	Name of the reference plant & location:	
2:	Client name and his address:	
3:	No. of units and capacity in MW of unit:	
4:	Whether operating in a Wet Limestone based FGD application in Coal fired power plant	Yes/No
5:	Name of equipment manufacturer & address:	
6:	Date of commission of the equipments:	
7:	Model no. of the equipment:	
8:	Brief Technical particulars of the equipments:	
9:	Flow	m ³ /h

Signature of authorized signatory:.....

Sl. No.	Description	Reference Work
10.	Head	 meters of liquid column
11.	Whether the equipment(s) are in successful operation in atleast one (01) plant for a period not less than one(01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	 *Yes/*No
12.	Flue gas Desulphurization system details:	*Technical extract/ *paper letter/ *email/ *Drawing from user or *contract document or *scheme of *any document in public domain enclosed at annexure.....to Attachment-3K
13.	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment-3K
14.	Performance details:	*Certificate/*Letter/*E mail from End-user enclosed at Annexure.....to Attachment-3K

* Strike off whichever is not applicable:

Signature of authorized signatory.....

G. **Oxidation Blowers:** We declare that, we/our Sub Vendor, have designed (either by itself or under collaboration /licensing agreement), *manufactured/ *get manufactured and supplied at least one (1) number of Oxidation Blower of minimum 80% of the flow & 100% of the head of the offered Blower, Centrifugal/positive displacement type working in FGD application in Coal fired power plant and which has been in successful operation for minimum one (1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:

Sl. No.	Description	Reference Work
1:	Name of the reference plant & location:	
2:	Client name and his address: Oxidation	
3:	No. of units and capacity in MW of unit:	
4:	Whether power plant is coal fired	Yes / No
5:	Whether operating in a Wet Limestone based FGD application in Coal fired power plant	Yes / No
6:	Name of equipment manufacturer & address:	
7:	Date of commission of the equipments:	
8:	Model no. of the equipment:	
9:	Brief Technical particulars of the equipments:	
10:	Flow	Nm ³ /h

Signature of authorized signatory:.....

Sl. No.	Description	Reference Work
11:	Head-	mmWVC
12:	Whether the equipment(s) are in successful operation in atleast one (01) plant for a period not less than one (01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	*Yes/*No
13:	Flue gas Desulphurization system details:	*Technical extract/*paper letter/*email/ *Drawing from user or *contract document or *scheme of *any document in public domain enclosed at annexure.....to Attachment-3K
14:	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment-3K
15:	Performance details:	*Certificate/*Letter/*E-mail from End-user enclosed at Annexure.....to Attachment-3K

* Strike off whichever is not applicable;

Signature of authorized signatory.....

D: ~~Wet limestone Grinding mills. We declare that, we/our Sub Vendor, have designed (either by itself or under collaboration / licensing agreement), *manufactured/*got manufactured and supplied at least one (1) number of Wet limestone Grinding mill of minimum 80% of the offered Ball mill capacity with pulverizing fineness not less than 90% thru 325 mesh, working in Wet limestone based FGD application in Coal fired power plant and which has been in successful operation for minimum one(1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:~~

Sl. No.	Description	Reference Work
1:	Name of the reference plant & location:	
2:	Client name and his address:	
3:	Whether power plant is coal fired	*Yes/*No
4:	Whether operating in a Wet Limestone based FGD application in Coal fired power plant	*Yes/*No
5:	Name of equipment manufacturer & address:	
6:	Date of commission of the equipments:	
7:	Model no. of the equipment:	
8:	Brief Technical particulars of the equipments:	
9:	Capacity	TPH with pulverizing fineness not less than 90% thru 325 mesh

Signature of authorized signatory:.....

Sl. No.	Description	Reference Work
10.	Whether the equipment(s) are in successful operation in atleast one (01) plant for a period not less than one (01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	*Yes/*No
11.	Flue gas Desulphurization system details:	*Technical extract/*paper letter/*email/ *Drawing from user or *contract document or *scheme or *any document in public domain enclosed at annexure.....to Attachment 3K
12.	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment 3K
13.	Performance details:	*Certificate/*Letter/*E mail from End-user enclosed at Annexure.....to Attachment 3K

* Strike off whichever is not applicable.

Signature of authorized signatory.....

E. Slurry Pumps: We declare that, we/our Sub-Vendor, have designed (either by itself or under collaboration / licensing agreement), *manufactured/*got manufactured and supplied at least one (1) number of Slurry Pump of minimum 80% of the flow & 100% of the head of the offered Slurry Pump(s), Centrifugal type working in Wet Limestone based FGD application or ash slurry application in coal fired power plant and which has been in successful operation for minimum one (1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:

Sl. No.	Description	Reference Work
1.	Name of the reference plant & location:	
2.	Client name and his address:	
3.	No. of units and capacity in MW of unit:	
4.	Whether operating in a Wet Limestone based FGD application or similar process/duty application	-*Yes/*No
5.	Whether operating in a similar process/duty application	-*Yes/*No....(indicate industry type)
6.	Name of equipment manufacturer & address:	
7.	Date of commission of the equipments:	
8.	Model no. of the equipment:	
9.	Brief Technical particulars of the equipments:	
10.	Flow-	m ³ /h

Signature of authorized signatory.....

Sl. No.	Description	Reference Work
11.	Head-	 meters of liquid column
12.	Whether the equipment(s) are in successful operation in atleast one(01) plant for a period not less than one(01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	-*Yes/*No
13.	Flue gas Desulphurization system details:	*Technical extract/ *paper letter/ *email/ *Drawing from user or *contract document or *scheme or *any document in public domain enclosed at annexure.....to Attachment-3K
14.	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment-3K
15.	Performance details:	*Certificate/*Letter/*E-mail from End user enclosed at Annexure.....to Attachment-3K

* Strike off whichever is not applicable.

Signature of authorized signatory.....

F. Agitators: We declare that, we/our Sub-Vendor, have designed (either by itself or under collaboration / licensing agreement), *manufactured/*get manufactured and supplied at least one (1) number of Agitators with rating not less than that supplied for 500 MW or higher size unit for similar application, Vertical/Horizontal type working in Wet Limestone based FGD application in Coal fired power plant and which has been in successful operation for minimum one(1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below::

Sl.No.	Description	Reference Work
1:	Name of the reference plant & location:	
2:	Client name and his address:	
3:	No. of units and capacity in MW of unit:	
4:	Whether power plant is coal fired	*Yes/*No
5:	Whether operating in a Wet Limestone based FGD application in coal fired power plant	*Yes/*No
6:	Name of equipment manufacturer & address:	
7:	Date of commission of the equipments:	
8:	Model no. of the equipment:	
9:	Brief Technical particulars of the equipments:	
10:	Agitators supplied for	MW unit size

Signature of authorized signatory:.....

Sl. No.	Description	Reference Work
11:	Whether the equipment(s) are in successful operation in atleast one(01) plant for a period not less than one(01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	*Yes/*No
12:	Flue gas Desulphurization system details:	*Technical extract/*paper letter/*email/ *Drawing from user of *contract docu ment or *scheme of *any document in public domain enclosed at annexure.....to Attachment-3K
13:	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment-3K
14:	Performance details:	*Certificate/*Letter/*E-mail from End-user enclosed at Annexure.....to Attachment-3K

* Strike off whichever is not applicable.

Signature of authorized signatory.....

G: Vacuum Belt filters: We declare that, we/our Sub Vendor, have designed (either by itself or under collaboration / licensing agreement), *manufactured/*got manufactured and supplied at least one (1) number of Vacuum Belt filter of minimum 80% of the offered Vacuum Belt filter capacity, Belt type, working in Wet Limestone based FGD application in Coal fired power plant and which has been in successful operation for minimum one(1) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder, as per the details furnished below:

Sl.No:	Description	Reference Work
--------	-------------	----------------

- | | | |
|-----|--|---------------------|
| 1: | Name of the reference plant & location: | |
| 2: | Client name and his address: | |
| 3: | No. of units and capacity in MW of unit: | |
| 4: | Whether power plant is coal fired | *Yes/*No |
| 5: | Whether operating in a Wet Limestone based FGD application in coal fired power plant | *Yes/*No |
| 6: | Name of equipment manufacturer & address: | |
| 7: | Date of commission of the equipment: | |
| 8: | Model no. of the equipment: | |
| 9: | Brief Technical particulars of the equipment: | |
| 10: | Capacity |TPH |

Signature of authorized signatory.....

Sl. No.	Description	Reference Work
11:	Whether the equipment(s) are in successful operation in atleast one (01) plant for a period not less than one (01) year reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder	*Yes/*No
12:	Flue gas Desulphurization system details:	*Technical extract/*paper letter/*email/ *Drawing from user or *contract docu ment or *scheme or *any document in public domain enclosed at annexure.....to Attachment 3K
13:	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure.....to Attachment 3K
14:	Performance details:	*Certificate/*Letter/*E mail from End user enclosed at Annexure.....to Attachment 3K

* Strike off whichever is not applicable.

Signature of authorized signatory.....

- *2.00.00** **Applicable for Bidder/its sub vendor seeking provenness criteria as per clause no. 4.01.02 & 4.01.03, Sub section-I, Part-A of Section-VI.**
- 2.01.00** We, hereby confirm that we/our sub-vendor are a regular manufacturer of Booster Fan for units of atleast 500MW rating and the details in this regard on provenness criteria as per clause 4.01.02, sub-section-I, Part-A, Section-VI are hereby furnished below:
- *Bidder to strike off whichever is not applicable.**
- (Data to be furnished in line with format given at 1.00.00 of this Attachment)**
- 2.02.00** We further confirm that details in respect of collaboration / valid licencing agreement for the aforesaid equipment as per 2.01.00 above who meets the requirement stipulated at clause 4.01.02, sub-section-I, Part-A, Section-VI are enclosed at **Annexure-.....** to this Attachment. The data in respect of provenness criteria for these equipment which are in successful operation in at least one (1) plant for a period not less than one reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder are furnished below. We further confirm that we/ our sub vendor(s) have created manufacturing and testing facilities at our/ their works as per collaborator's/ Licensor's design, manufacturing & quality control system for these equipment(s)/ Auxiliary(ies).
- (Data to be furnished in line with format given at 1.00.00 of this Attachment)**
- *3.00.00** **Applicable for JV Company/Subsidiary Company meeting provenness criteria as per clause no. 4.01.04, Sub section-IA, Part-A of Section-VI.**
- 3.01.00** We, hereby confirm that JV company/ Subsidiary company (Strike off whichever is not applicable) formed for manufacturing and supply of equipment(s) (*Booster Fans, *Slurry Recirculation Pumps, *Oxidation Blowers, *Wet Limestone Grinding Mills, *Slurry Pumps, *Agitators, *vacuum belt filters) has a valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing of such equipment(s) in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 4.01.02 of sub-section-I, Part-A, Section VI of bidding documents (or the technology provider of the qualified equipment manufacturer). Further, in such a case, such qualified equipment manufacturers is having, directly or indirectly through its holding company/subsidiary company, at least 26% equity participation in the Indian Joint Venture Company/subsidiary company, which shall be maintained for a lock-in period of seven (7) years from the date of incorporation of such Joint Venture / Subsidiary or up to the end of defect liability period of the contract, whichever is later. Before taking up the manufacturing of such equipment(s) (*Booster Fans, *Slurry Recirculation Pumps, *Oxidation Blowers, *Wet Limestone Grinding Mills, *Slurry

Signature of authorized signatory.....

Pumps, *Agitators, vacuum belt filters), we/ our sub vendor(s) *will create /have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.

We further confirm that details in respect of collaboration / valid licencing agreement for the aforesaid equipment(s) (*Booster Fans, *Slurry Recirculation Pumps, *Oxidation Blowers, *Wet Limestone Grinding Mills, *Slurry Pumps, *Agitators, vacuum belt filters) who meets the requirement stipulated at clause 4.01.02, sub-section-I, Part-A, Section-VI for are enclosed at Annexure-..... to this Attachment.

In addition, the Bidder along with its sub-vendors, as per 3.01.00 above (if applicable) and the qualified Oxidation Blower manufacturer and its holding/ subsidiary Company, as applicable, shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed at Attachment-3K

***4.00.00**

Applicable for Bidder/his sub vendors seeking provenness criteria as per clause no. 4.01.05, Sub section-I, Part-A of Section-VI.

4.01.00

We, hereby confirm that *we/*our sub-vendors is a manufacturer of Blowers/compressors for minimum 50 NM³/min capacity.
(Details of references enclosed at Annexure)

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

4.02.00

We further confirm that details in respect of collaboration / valid licencing agreement for the Oxidation Blower between *us/*our sub-vendors, as per 4.01.00 above, and with qualified Oxidation Blower manufacturer, who meets the requirement stipulated at clause 4.01.02, sub-section-I, Part-A, Section-VI are enclosed as per Annexure-..... to this Attachment. The data in respect of provenness criteria for the qualified Oxidation Blower manufacturer, which are in successful operation in at least one (1) plant for a period not less than one reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder are furnished below. We further confirm that we/ our sub vendor(s) have created manufacturing and testing facilities at our/ their works as per collaborator's/ Licensor's design, manufacturing & quality control system for the Oxidation Blowers.

We further confirm that before taking up the manufacturing of such Oxidation Blower *we/ *our sub vendor(s) *will create /have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.

Signature of authorized signatory.....

We further confirm that details in respect of collaboration / valid licencing agreement for the Oxidation Blowers who meets the requirement stipulated at clause 4.01.02, sub-section-I, Part-A, Section-VI for are enclosed at Annexure-..... to this Attachment. In addition, the Bidder along with our sub-vendors, as per 4.01.00 above (if applicable) and the qualified Oxidation Blower manufacturer and its holding/ subsidiary Company, as applicable, shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed at Attachment-3K.

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

*5.00.00 Applicable for Bidder/his sub vendors seeking provenness criteria as per clause no. 4.01.06, Sub section-I, Part-A of Section-VI.

5.01.00 We, hereby confirm that *we/*our sub-vendors is a manufacturer of Dry Grinding Mills for minimum 20 T/h capacity. (Details of references enclosed at Annexure)

(Data to be furnished in line with format given at 1.00.00 of this Attachment))

5.02.00 We further confirm that details in respect of collaboration / valid licencing agreement for the Wet Grinding Mills between *us/*our sub-vendors, as per 5.01.00 above, and with qualified Wet Grinding Mill manufacturer, who meets the requirement stipulated at clause 4.01.02, sub-section-I, Part-A, Section-VI are enclosed at Annexure-..... to this Attachment. The data in respect of provenness criteria for the qualified Wet Grinding Mill manufacturer, which is in successful operation in at least one (1) plant for a period not less than one reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder are furnished below.

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

We further confirm that before taking up the manufacturing of such Wet Grinding Mill *we/ *our sub vendor(s) *will create /*have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.

In addition, the Bidder along with our sub-vendors, as per 5.01.00 above (if applicable) and the qualified Wet Grinding Mill manufacturer and its holding/ subsidiary Company, as applicable, shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed at Attachment-3K.

Signature of authorized signatory.....

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

*6.00.00

Applicable for Bidder/his sub vendors seeking provenness criteria as per clause no. 4.01.07, Sub section-I, Part-A of Section-VI.

6.01.00

We, hereby confirm that *we/*our sub-vendors is a manufacturer of a manufacturer of Agitators for similar process/duty application in petrochemical or metals and mining industry. (Details of references enclosed at Annexure)

(Data to be furnished in line with format given at 1.00.00 of this Attachment))

6.02.00

We further confirm that details in respect of collaboration / valid licencing agreement for the Agitator between *us/*our sub-vendors, as per 6.01.00 above, and with qualified Agitator manufacturer, who meets the requirement stipulated at clause 4.01.02, sub-section-I, Part-A, Section-VI are enclosed at Annexure-..... to this Attachment. The data in respect of provenness criteria for the qualified Agitator manufacturer, which is in successful operation in at least one (1) plant for a period not less than one reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder are furnished below.

We further confirm that before taking up the manufacturing of such Agitator, *we/ *our sub vendor(s) *will create *have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.

In addition, the Bidder along with our sub-vendors, as per 6.01.00 above (if applicable) and the qualified Agitators manufacturer and its holding/ subsidiary Company, as applicable, shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed at Attachment-3K.

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

Signature of authorized signatory.....

***7.00.00** **Applicable for Bidder/his sub vendors seeking provenness criteria as per clause no. 4.01.08, Sub section-I, Part-A of Section-VI.**

7.01.00 We, hereby confirm that *we/*our sub-vendors is a manufacturer of a manufacturer of Slurry Pumps who meets the requirements stipulated at clause 4.01.02 (e), sub-section-I, Part-A, Section-VI.
(Details of references enclosed at Annexure)

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

7.02.00 We further confirm that details in respect of collaboration / valid licencing agreement for the Slurry Recirculation Pumps, between *us/*our sub-vendors, as per 7.01.00 above, and with qualified Slurry Recirculation Pump manufacturer, who meets the requirement stipulated at clause **4.01.02(b)**, sub-section-I, Part-A, Section-VI are enclosed at **Annexure-.....** to this Attachment. The data in respect of provenness criteria for the qualified Slurry Recirculation Pump manufacturer, which is in successful operation in at least one (1) plant for a period not less than one reckoned as on the date of consideration for approval but not later than six months to award date of contract to the Main bidder are furnished below.

We further confirm that before taking up the manufacturing of such Slurry Recirculation Pumps, *we/*our sub vendor(s) *will create /*have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system.
In addition, the Bidder along with our sub-vendors, as per 7.01.00 above (if applicable) and the qualified Lime stone slurry recirculation pump manufacturer and its holding/ subsidiary Company, as applicable, shall furnish DJU in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment as per the format enclosed at **Attachment-3K**.

(Data to be furnished in line with format given at 1.00.00 of this Attachment)

Signature of authorized signatory.....

FORM OF DEED OF JOINT UNDERTAKING TO BE PROVIDED
FOR *BOOSTER FANS/*SLURRY RECIRCULATION PUMPS/*OXIDATION BLOWERS/*WET LIMESTONE GRINDING MILLS/*SLURRY
PUMPS/*AGITATORS/*VACUUM BELT FILTERS (TO BE FILLED SEPARATELY FOR EACH APPLICABLE EQUIPMENT)
AS PER CLAUSE 4.01.04 OF SUB-SECTION-I, PART A, SECTION VI

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

DEED OF JOINT UNDERTAKING TO BE EXECUTED BY THE BIDDER/CONTRACTOR, INDIAN JV/SUBSIDIARY COMPANY MEETING
THE REQUIREMENTS SPECIFIED AT CLAUSE NO. 4.01.04 OF SUB-SECTION-I, PART A, SECTION VI AND THE QUALIFIED EQUIPMENT
MANUFACTURER & ITS *HOLDING/*SUBSIDIARY COMPANY(IES), AS APPLICABLE, MEETING THE REQUIREMENTS AS PER CLAUSE
4.01.02 OF SUB-SECTION-I, PART A, SECTION VI FOR *BOOSTER FANS/*SLURRY RECIRCULATION PUMP/*OXIDATION
BLOWERS/*WET LIMESTONE GRINDING MILLS/*SLURRY PUMPS/*AGITATORS/*VACUUM BELT FILTERS IN WHICH EXECUTANT OF
THE DJUs ARE JOINTLY AND SEVERALLY LIABLE FOR THE SUCCESSFUL PERFORMANCE OF THE *BOOSTER FANS/*SLURRY
RECIRCULATION PUMP/*OXIDATION BLOWERS/*WET LIMESTONE GRINDING MILLS/*SLURRY PUMPS/*AGITATORS/*VACUUM BELT
FILTERS

The DEED OF UNDERTAKING executed this day of by M/s a Company
incorporated under having its Registered Office at (hereinafter called the "Bidder/Contractor", which
expression shall include its successors, administrators, executors and permitted assigns) AND

**M/s a JV / SUBSIDIARY COMPANY as per the requirement of clause 4.01.04 of sub-section-I,
Part-A, Section-VI, incorporated under having its Registered Office at (hereinafter
called the " Indian JV/ SUBSIDIARY Manufacturing Company"), which expression shall include its successors, administrators, executors and
permitted assigns) AND

M/s having its Registered Office at (hereinafter called the "Qualified
Equipment Manufacturer", which expression shall include its successors, administrators, executors and permitted assigns) AND
*M/s having its Registered Office at
hereinafter called holding/ subsidiary company of the qualified equipment manufacturer in favour of NTPC Limited, A Government of India
Enterprise, incorporated under the Companies Act, 1956, having its Registered Office at NTPC Bhawan, Scope Complex, 7, Institutional Area,
Lodhi Road, New Delhi-110003 INDIA (hereinafter called "NTPC" or "Employer" which expression shall include its successors, administrators,
executors and assigns).

Signature of authorized signatory.....

WHEREAS, the Employer invited Bids for design, engineering, manufacture, supply, transportation to site, construction, installation, testing, commissioning and conductance of guarantee tests for the Flue Gas Desulphurisation (FGD) System Package for North Karanpura STPP (3X660MW) (hereinafter referred to as "Plant") vide its Bidding Document No. CS-4410-109-2.

AND WHEREAS vide clause 4.01.04 of Sub-Section-I, Part A, Section VI of bidding documents, it has been specified that a Qualified Indian Manufacturing Company can also manufacture equipment listed at clause no. 4.01.02 (...) of Sub-Section-I, Part A, Section VI for which it is qualified, provided that it has a valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing of *BOOSTER FANS/*SLURRY RECIRCULATION PUMP/*OXIDATION BLOWERS/*WET LIMESTONE GRINDING MILLS/*SLURRY PUMPS/*AGITATORS/*VACUUM BELT FILTERS in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 4.01.02(...) of Sub-Section-I, Part-A, Section-VI of bidding documents. Before taking up the manufacturing of *BOOSTER FANS/*SLURRY RECIRCULATION PUMP/*OXIDATION BLOWERS/*WET LIMESTONE GRINDING MILLS/*SLURRY PUMPS/*AGITATORS/*VACUUM BELT FILTERS, the bidder/ his sub-vendor(s) must create /have created manufacturing facilities at his works as per collaborator's/ licensor's design, manufacturing and quality control system for Wet limestone Grinding mill. In addition, the Bidder/Contractor along with the Qualified Indian JV/SUBSIDIARY Manufacturing Company, qualified equipment manufacturers and its holding/subsidiary company shall furnish DJU for each equipment in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment.

WHEREAS M/s (Bidder/Contractor) has submitted its proposal in response to the aforesaid Invitation for Bid by the Employer bearing No. dated for Flue Gas Desulphurisation (FGD) System Package for North Karanpura STPP (3X660MW) (hereinafter referred to as "Plant") vide its Bidding Document No. CS-4410-109-2.

AND WHEREAS M/s (Indian JV/SUBSIDIARY Company) meets the requirement of clause 4.01.04 of sub-section-I, Part-A, Section-VI and has a valid ongoing collaboration*/licensing* agreement for design, engineering, manufacturing of(Name Of Equipment) in India with M/swho meets the requirements stipulated at clause 4.01.02(a)*/(b)*/(c)*/(d)*/(e)*/(f)*/(g)* of Sub-Section-I, Part A, Section-VI of bidding documents.

AND WHEREAS M/s (Qualified Equipment Manufacturer) meets the requirements of clause 4.01.02 of sub-section-I, Part-A, Section-VI for(Name Of Equipment)

AND WHEREAS M/s..... directly*/indirectly through its holding/subsidiary company M/s* have atleast 26% equity participation in the Indian JV/SUBSIDIARY Company which shall be maintained for a lock in period of seven (7) years from the date of incorporation of the Indian JV/ SUBSIDIARY Company or upto the end of defect liability of the contract whichever is later.

Signature of authorized signatory.....

AND WHEREAS the Bidder/Contractor along with the *Qualified Indian Manufacturing Company , Qualified Equipment Manufacturers alongwith its holding/subsidiary company are required to jointly execute and furnish prior to the placement of order for..... (Name of equipment), an irrevocable Deed of Joint Undertaking and be jointly and severally responsible and bound unto the Employer for successful performance of the (Name of Equipment) for **North Karanpura STPP (3X660MW) Project** fully meeting the stipulated technical requirements, guaranteed parameters and characteristics as per the Bidding Documents, in the event the bid is accepted by the Employer resulting into a Contract.

NOW THEREFORE, THIS DEED WITNESSETH AS UNDER:

1. We the Qualified Equipment Manufacturer and the Indian JV/SUBSIDIARY Company and the Bidder/Contractor, do hereby declare and undertake that we shall be jointly and severally responsible to the Employer for the successful performance of the (Name of Equipment).
2. In case of any breach of the Contract committed by the Indian JV/SUBSIDIARY, we the Bidder/Contractor and Qualified Equipment Manufacturer do hereby undertake, declare and confirm that we shall be fully responsible for the successful performance of the (Name of Equipment) and undertake to carryout all the obligations and responsibilities under this Deed of Joint Undertaking in order to discharge the Indian JV/SUBSIDIARY Company obligations stipulated under the Contract. Further, if the Employer sustains any loss or damage on account of any breach of the Contract for the (Name of Equipment), we the Bidder/Contractor and Qualified Equipment Manufacturer jointly and severally undertake to promptly indemnify and pay such loss/damages caused to the Employer on its written demand without any demur, reservation, Contest or protest in any manner whatsoever. This is without prejudice to any rights of the Employer against the Contractor/ his Sub-Vendor under the Contract and/or guaranteees. It shall not be necessary or obligatory for the Employer to first proceed against the Indian JV/SUBSIDIARY Company / Bidder/Contractor before proceeding against the Qualified Equipment Manufacturer nor any extension of time or any relaxation given by the Employer to the Qualified Indian Manufacturing Company / **Bidder/Contractor shall prejudice any rights of the Employer under this Deed of Joint Undertaking to proceed against the Qualified Equipment Manufacturer.
3. The liability of the Contractor, his sub-vendor and Associate/Collaborator shall be limited to an amount equal to 100% of the value of the contract** between the contractor and the sub supplier for the equipment.
4. Without prejudice to the generality of the Undertaking in paragraph 1 above, the manner of achieving the objective set forth in paragraph 1 above shall be as follows:
 - (a) We the Qualified Equipment Manufacturer shall ensure that complete design, manufacturing, quality assurance and installation of the (Name of Equipment) is carried out inline with our manufacturing & quality drawings and

Signature of authorized signatory.....

procedures and shall be fully responsible for its compliance so as to ensure satisfactory, reliable, safe and trouble free performance of (Name of Equipment).

Further, we, the Qualified Equipment Manufacturer shall extend our quality surveillance/ supervision/ quality control to the Contractor during manufacture, erection, commissioning and performance testing, both at Qualified Indian Manufacturing Company's works and/ or at Employer's project site.

Further, the Qualified Equipment Manufacturer shall depute their technical experts from time to time to the Indian JV/SUBSIDIARY Manufacturing Company's works/ Employer's project site as required by the Employer and agreed to by Indian JV/SUBSIDIARY Manufacturing Company to facilitate the successful performance of the (Name of Equipment) as stipulated in the aforesaid Contract.

Further, the Qualified Equipment Manufacturer shall ensure proper design, manufacture, installation, testing and successful performance of the (Name of Equipment) under the said Contract in accordance with stipulations of Bidding Documents and if necessary, the Qualified Equipment Manufacturer shall advise the Indian JV/SUBSIDIARY Manufacturing Company suitable modifications of design and implement necessary corrective measures to discharge the obligations under the contract.

(b) In the event Indian JV/SUBSIDIARY Manufacturing Company /Contractor fail to demonstrate that the (Name of Equipment) meets the guaranteed parameters and demonstration parameters as specified in the contract, the Qualified Equipment Manufacturer shall promptly carry out all the corrective measures related to engineering services at their own expense and shall promptly provide corrected design to the Employer.

(c) Implementation of the corrected design and all other necessary repairs, replacements, rectification or modifications to the (Name of Equipment) and payment of financial liabilities and penalties and fulfillment of all other contractual obligations as provided under the contract shall be the joint and severally responsibility of the Contractor and Indian JV/SUBSIDIARY Manufacturing Company and Qualified Equipment Manufacturer.

5. We, the Bidder/Contractor and Qualified Equipment Manufacturer and the Indian JV/SUBSIDIARY Manufacturing Company do hereby undertake and confirm that this Undertaking shall be irrevocable and shall not be revoked till ninety (90) days after the end of the defect liability period of the equipment covered under the Contract and further stipulate that the Undertaking herein contained shall terminate after ninety (90) days of satisfactory completion of such defect liability period. In case of delay in completion of defect liability period, the validity of this Deed of Joint Undertaking shall be extended by such period of delay. We further agree that this Undertaking shall be

Signature of authorized signatory.....

without any prejudice to the various liabilities of the Contractor including Contract Performance Security as well as other obligations of the Contractor in terms of the Contract.

6. The Bidder/Contractor and Qualified Equipment Manufacturer will be fully responsible for the quality of all the equipment/main assemblies/components manufactured at their works or at their Vendors' works or constructed at site, and their repair or replacement, if necessary, for incorporation in the Plant and timely delivery thereof to meet the completion schedule under the Contract.
7. In case of Award, in addition to the Contract Performance Security for the Contract, the Qualified Equipment Manufacturer, its holding/subsidiary company (as applicable) and Indian JV/SUBSIDIARY manufacturing company shall furnish 'as security' an on demand Performance Bank Guarantee in favour of the Employer as per provisions of the bidding documents. The value of such Bank Guarantee shall be equal to **INR 1.5 Million (Indian Rupees One and half Million) for each** and it shall be guarantee towards the faithful performance /compliance of this Deed of Joint Undertaking in accordance with the terms and conditions specified herein. The bank guarantee shall be unconditional, irrevocable and valid till ninety (90) days beyond the end of defect liability period of the last equipment covered under the Contract. In case of delay in completion of the defect liability period, the validity of this Bank Guarantee shall be extended by the period of such delay. The guarantee amount shall be promptly paid to the Employer on demand without any demur, reservation, protest or contest.
8. Any dispute that may arise in connection with this Deed of Joint Undertaking shall be settled as per arbitration procedure/rules mentioned in the Contract Documents. This Deed of Joint Undertaking shall be construed and interpreted in accordance with the Laws of India and the Courts of Delhi shall have exclusive jurisdiction.
9. We, the Bidder/Contractor and Qualified Equipment Manufacturer and the Indian JV/SUBSIDIARY Manufacturing Company shall form an integral part of the Contracts from the date of signing of this Deed of Joint Undertaking. We further agree that this Deed of Joint Undertaking shall continue to be enforceable till its validity.
10. That this Deed of Joint Undertaking shall be operative from the effective date of signing of this Deed of Joint Undertaking.

IN WITNESS WHEREOF, the Bidder/Contractor and Qualified Equipment Manufacturer and its holding/subsidiary company (as applicable) and the Indian JV/SUBSIDIARY Manufacturing Company through their authorised representatives, have executed these presents and affixed common seal of their respective companies, on the day, month and year first mentioned above.

1. WITNESS

For M/s
(Bidder/Contractor)

Signature of authorized signatory.....

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..... (Signature Name)	(Signature of the Authorised Representative)
..... (Official Address)	Name
	Designation
	Common Seal of the Company
1. WITNESS	For M/s (Indian JV/SUSIDIARY Company)
..... (Signature Name) Representative)	(Signature of the Authorised
..... (Official Address)	Name.....
Designation	
Company	Common Seal of the
1. WITNESS	For M/s (Qualified Equipment Manufacturer)
..... (Signature Name)	(Signature of the Authorised Representative)

Signature of authorized signatory.....

.....
(Official Address)
Name.....
Designation

Common Seal of the
Company

1. WITNESS

For M/s
(Holding/subsidiary company to Qualified Equipment Manufacturer)

.....
(Signature Name)
.....
(Official Address)
Name.....
(Signature of the Authorised
Representative)

Designation

Common Seal of the
Company

Note : Power of Attorney of the persons signing the said Deed of Joint Undertaking is to be furnished.

* Contractor/Sub-Vendor shall strike out, whichever is not applicable

** copy of priced purchase order for the equipment/system shall be furnished by the Bidder.

Signature of authorized signatory.....

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FORM OF DEED OF JOINT UNDERTAKING TO BE PROVIDED
FOR SLURRY RECIRCULATION PUMP
AS PER CLAUSE 4.01.08 OF SUB-SECTION-I, PART A, SECTION VI
(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

DEED OF JOINT UNDERTAKING TO BE EXECUTED BY THE BIDDER/CONTRACTOR, QUALIFIED INDIAN MANUFACTURING COMPANY MEETING THE REQUIREMENTS SPECIFIED AT CLAUSE NO. 4.01.08 OF SUB-SECTION-I, PART A, SECTION VI AND QUALIFIED EQUIPMENT MANUFACTURER OF SLURRY PUMPS MEETING THE REQUIREMENTS AT CLAUSE 4.01.02 (e) OF SUB-SECTION-I, PART A, SECTION VI FOR SLURRY RECIRCULATION PUMP FOR SUCCESSFUL PERFORMANCE OF SLURRY RECIRCULATION PUMP IN WHICH EXECUTANT OF THE DJU ARE JOINTLY AND SEVERALLY LIABLE FOR THE SUCCESSFUL PERFORMANCE OF THE SLURRY RECIRCULATION PUMP

The DEED OF UNDERTAKING executed this day of Two thousand by M/s a Company incorporated under having its Registered Office at (hereinafter called the "Bidder/Contractor", which expression shall include its successors, administrators, executors and permitted assigns) AND

**M/s a SLURRY PUMPS manufacturer as per the requirement of clause 4.01.08 of sub-section-I, Part-A, Section-VI, incorporated under having its Registered Office at (hereinafter called the "Qualified Indian Manufacturing Company"), which expression shall include its successors, administrators, executors and permitted assigns) AND

M/s a SLURRY PUMPS manufacturer meeting the requirements of clause 4.01.02(b) of sub-section-I, Part-A, Section-VI for slurry recirculation pump incorporated under having its Registered Office at (hereinafter called the "Qualified Equipment Manufacturer", which expression shall include its successors, administrators, executors and permitted assigns) AND

in favour of NTPC Limited, A Government of India Enterprise, incorporated under the Companies Act, 1956, having its Registered Office at NTPC Bhawan, Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi-110003 INDIA (hereinafter called "NTPC" or "Employer" which expression shall include its successors, administrators, executors and assigns).

WHEREAS, the Employer invited Bids for design, engineering, manufacture, supply, transportation to site, construction, installation, testing, commissioning and conductance of guarantee tests for the Flue Gas Desulphurisation (FGD) System Package for North Karanpura STPP (3X660MW) (hereinafter referred to as "Plant") vide its Bidding Document No. CS-4410-109-2.

Signature of authorized signatory.....

AND WHEREAS vide clause 4.01.08 of Sub-Section-I, Part A, Section VI of bidding documents, it has been specified that a Qualified Indian Manufacturing Company can also manufacture equipment listed at clause no. 4.01.02(b) of Sub-Section-I, Part A, Section VI for which it is qualified, provided that it has a valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing of **SLURRY PUMPS/SLURRY RECIRCULATION PUMP** in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 4.01.02(e) of Sub-Section-I, Part-A, Section-VI for **SLURRY RECIRCULATION PUMP** of bidding documents. Before taking up the manufacturing of **SLURRY RECIRCULATION PUMPS**, the bidder/ his sub-vendor(s) must create /have created manufacturing facilities at his works as per collaborator's/ licensor's design, manufacturing and quality control system for **SLURRY RECIRCULATION PUMPS**. In addition, the Bidder/Contractor along with the Qualified Indian Manufacturing Company, qualified equipment manufacturers shall furnish DJU for each equipment in which executant of the DJU shall be jointly and severally liable for the successful performance of the equipment.

WHEREAS M/s (Bidder/Contractor) has submitted its proposal in response to the aforesaid Invitation for Bid by the Employer bearing No. dated for **Flue Gas Desulphurisation (FGD) System Package for North Karanpura STPP (3X660MW)** (hereinafter referred to as "Plant") vide its Bidding Document No. **CS-4410-109-2**.

AND WHEREAS M/s (Qualified Indian Manufacturing Company) meets the requirement of clause 4.01.08 of sub-section-I, Part-A, Section-VI and has a valid ongoing collaboration and technology transfer agreement for design, engineering, manufacturing, supply of (Name Of Equipment) in India with M/s who meets the requirements stipulated at clause 4.01.02(e) of Sub-Section-I, Part A, Section-VI of bidding documents.

AND WHEREAS M/s (Qualified Equipment Manufacturer) meets the requirements of clause 4.01.02(e) of sub-section-I, Part-A, Section-VI for (Name Of Equipment).

The Bidder/Contractor along with the *Qualified Indian Manufacturing Company , Qualified Equipment Manufacturers, are required to jointly execute and furnish prior to the placement of order for..... (Name of equipment), an irrevocable Deed of Joint Undertaking and be jointly and severally responsible and bound unto the Employer for successful performance of the (Name of Equipment) for **North Karanpura STPP (3X660MW) Project** fully meeting the stipulated technical requirements, guaranteed parameters and characteristics as per the Bidding Documents, in the event the bid is accepted by the Employer resulting into a Contract.

NOW THEREFORE, THIS DEED WITNESSETH AS UNDER:

1. We the Qualified Equipment Manufacturer and the Qualified Indian Manufacturing Company and the Bidder/Contractor, do hereby declare and undertake that we shall be jointly and severally responsible to the Employer for the successful performance of the (Name of Equipment).

Signature of authorized signatory.....

2. In case of any breach of the Contract committed by the Qualified Indian Manufacturing Company, we the Bidder/Contractor and Qualified Equipment Manufacturer do hereby undertake, declare and confirm that we shall be fully responsible for the successful performance of the (Name of Equipment) and undertake to carryout all the obligations and responsibilities under this Deed of Joint Undertaking in order to discharge the Qualified Indian Manufacturing Company obligations stipulated under the Contract. Further, if the Employer sustains any loss or damage on account of any breach of the Contract for the (Name of Equipment), we the Bidder/Contractor and Qualified Equipment Manufacturer jointly and severally undertake to promptly indemnify and pay such loss/damages caused to the Employer on its written demand without any demur, reservation, Contest or protest in any manner whatsoever. This is without prejudice to any rights of the Employer against the Contractor/ his Sub-Vendor under the Contract and/or guarantees. It shall not be necessary or obligatory for the Employer to first proceed against the Indian Qualified Indian Manufacturing Company / Bidder/Contractor before proceeding against the Qualified Equipment Manufacturer nor any extension of time or any relaxation given by the Employer to the Qualified Indian Manufacturing Company / **Bidder/Contractor shall prejudice any rights of the Employer under this Deed of Joint Undertaking to proceed against the Qualified Equipment Manufacturer.
3. The liability of the Contractor, his sub-vendor and Associate/Collaborator shall be limited to an amount equal to 100% of the value of the contract** between the contractor and the sub supplier for the equipment.
4. Without prejudice to the generality of the Undertaking in paragraph 1 above, the manner of achieving the objective set forth in paragraph 1 above shall be as follows:
- (a) We the Qualified Equipment Manufacturer shall ensure that complete design, manufacturing, quality assurance and installation of the (Name of Equipment) is carried out inline with our manufacturing & quality drawings and procedures and shall be fully responsible for its compliance so as to ensure satisfactory, reliable, safe and trouble free performance of (Name of Equipment).
- Further, we, the Qualified Equipment Manufacturer shall extend our quality surveillance/ supervision/ quality control to the Contractor during manufacture, erection, commissioning and performance testing, both at Qualified Indian Manufacturing Company's works and/ or at Employer's project site.
- Further, the Qualified Equipment Manufacturer shall depute their technical experts from time to time to the Qualified Indian Manufacturing Company's works/ Employer's project site as required by the Employer and agreed to by Qualified Indian Manufacturing Company to facilitate the successful performance of the (Name of Equipment) as stipulated in the aforesaid Contract.

Signature of authorized signatory.....

Further, the Qualified Equipment Manufacturer shall ensure proper design, manufacture, installation, testing and successful performance of the (Name of Equipment) under the said Contract in accordance with stipulations of Bidding Documents and if necessary, the Qualified Equipment Manufacturer shall advise the Qualified Indian Manufacturing Company suitable modifications of design and implement necessary corrective measures to discharge the obligations under the contract.

- (b) In the event Indian Qualified Indian Manufacturing Company /Contractor fail to demonstrate that the (Name of Equipment) meets the guaranteed parameters and demonstration parameters as specified in the contract, the Qualified Equipment Manufacturer shall promptly carry out all the corrective measures related to engineering services at their own expense and shall promptly provide corrected design to the Employer.
- (c) Implementation of the corrected design and all other necessary repairs, replacements, rectification or modifications to the (Name of Equipment) and payment of financial liabilities and penalties and fulfillment of all other contractual obligations as provided under the contract shall be the joint and severally responsibility of the Contractor and Qualified Indian Manufacturing Company and Qualified Equipment Manufacturer.

5. We, the Bidder/Contractor and Qualified Equipment Manufacturer and the Qualified Indian Manufacturing Company do hereby undertake and confirm that this Undertaking shall be irrevocable and shall not be revoked till ninety (90) days after the end of the defect liability period of the equipment covered under the Contract and further stipulate that the Undertaking herein contained shall terminate after ninety (90) days of satisfactory completion of such defect liability period. In case of delay in completion of defect liability period, the validity of this Deed of Joint Undertaking shall be extended by such period of delay. We further agree that this Undertaking shall be without any prejudice to the various liabilities of the Contractor including Contract Performance Security as well as other obligations of the Contractor in terms of the Contract.

6. The Bidder/Contractor and Qualified Equipment Manufacturer will be fully responsible for the quality of all the equipment/main assemblies/components manufactured at their works or at their Vendors' works or constructed at site, and their repair or replacement, if necessary, for incorporation in the Plant and timely delivery thereof to meet the completion schedule under the Contract.

7. In case of Award, in addition to the Contract Performance Security for the Contract, the Qualified Equipment Manufacturer and Qualified Indian manufacturing company shall furnish 'as security' an on demand Performance Bank Guarantee in favour of the Employer as per provisions of the bidding documents. The value of such Bank Guarantee shall be equal to **INR 1.5 Million for each (Indian Rupees One and half Million)** and it shall be guarantee towards the faithful performance /compliance of this Deed of Joint Undertaking in accordance with the terms and conditions specified herein. The bank guarantee shall be unconditional, irrevocable and valid till ninety (90) days beyond the end of defect liability period of the last equipment covered under the Contract. In case of delay in completion of the defect

Signature of authorized signatory.....

liability period, the validity of this Bank Guarantee shall be extended by the period of such delay. The guarantee amount shall be promptly paid to the Employer on demand without any demur, reservation, protest or contest.

8. Any dispute that may arise in connection with this Deed of Joint Undertaking shall be settled as per arbitration procedure/rules mentioned in the Contract Documents. This Deed of Joint Undertaking shall be construed and interpreted in accordance with the Laws of India and the Courts of Delhi shall have exclusive jurisdiction.
9. We, the Bidder/Contractor and Qualified Equipment Manufacturer and the Qualified Indian Manufacturing Company shall form an integral part of the Contracts from the date of signing of this Deed of Joint Undertaking. We further agree that this Deed of Joint Undertaking shall continue to be enforceable till its validity.
10. That this Deed of Joint Undertaking shall be operative from the effective date of signing of this Deed of Joint Undertaking.

IN WITNESS WHEREOF, the Bidder/Contractor and Qualified Equipment Manufacturer and the Qualified Indian Manufacturing Company through their authorised representatives, have executed these presents and affixed common seal of their respective companies, on the day, month and year first mentioned above.

1.	WITNESS	For M/s
		(Bidder/Contractor)
	 (Signature Name)	(Signature of the Authorised Representative)
	 (Official Address)	Name
		Designation
		Common Seal of the Company
1.	WITNESS	For M/s

Signature of authorized signatory.....

(Qualified Indian Manufacturing Company)

(Signature of the Authorised

.....
(Signature Name)
Representative)

.....
(Official Address)

Name.....

Designation

Common Seal of the

Company

1. WITNESS

For M/s
(Qualified Equipment Manufacturer)

.....
(Signature Name)
(Signature of the Authorised
Representative)

.....
(Official Address)

Name.....

Designation

Common Seal of the
Company

Note : Power of Attorney of the persons signing the said Deed of Joint Undertaking is to be furnished.

* Contractor/Sub-Vendor shall strike out, whichever is not applicable

** copy of priced purchase order for the equipment/system shall be furnished by the Bidder.

Signature of authorized signatory.....