

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC CLARIFICATIONS
	Part	Sub-section	Clause no.			
678.	SECTION – VI, PART-D	Erection Condition of contract	44.22.00	Hydra shall not be used for material transport	Bidder understanding is that Farna shall be used in place of Hydra.	Specification requirement is clear. Bidder shall comply with the specification requirements.
679.	SECTION – VI, PART-A	Scope of supply and Services	2.00.00 (10)	Providing all necessary fire fighting devices/ Equipment/Fire tender etc. required during the project execution.....	Bidder shall provide all fire fighting devices / Equipment during the entire Project Execution period for its scope of work. However Bidder requested Employer to provide the Fire Tender of the existing Plant during emergency if required	Bidders understanding/request is not correct.
680.	SECTION – VI, PART-B	SUB-SECTION- VI-D Civil Works	4.01.00	Drainage System	Bidder clarifies that Employers existing drain invert level shall be necessary to plan the RCC drain(in the scope of Bidder) on which water from the pit in FGD area shall be diverted. So Bidder request Employer furnish the above information.	Refer General Layout Plan. Road and drain drawing shall be provided after award.
681.	SECTION – VI, PART-A	SUB-SECTION- II-A2-Project Information- Lara-I 2X800 MW	Annexure-II	Borelog Data Sheet	The Location and Coordinates of various borelogs marked in the data sheet does not match with the location indicated in GLP.	Bidder may refer Clause No.7.00.02, as mentioned in Clause No. 7.00.02, the available borelog data is of vicinity to proposed structure and the

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682.	SECTION – VI, PART-A	SUB-SECTION- II-A4-Project Information-Darlipalli-I 2X800 MW	-	Borelog Data	So Bidder request Employer to furnish the corrected documents.	same has already been furnished in the tender document. Detailed Geotechnical Investigation shall be carried out by contractor.
683.	SECTION – VI, PART-A	SUB-SECTION- II-A6-Project Information-Solapur-II 2X800 MW	-	Borelog Data	No borelog data is available in the tender. Bidder request Employer to furnish the nearest vicinity borelogs if not available for FGD area.	Bidder to refer necessary amendment in this regard.
684.	SECTION – VI, PART-A	SUB-SECTION- II-A6-Project Information-Solapur-II 2X800 MW	Annexure- III Soil Data and Foundation System	Net Allowable Bearing Pressure	No borelog data is available in the tender. Bidder request Employer to furnish the nearest vicinity borelogs if not available for FGD area.	Bidder to refer necessary amendment in this regard.
			20 of 31		Bidder understands that in case of soil for depths greater than 1.5m, net allowable bearing pressure value available as per detailed geotechnical investigation during that stage can be utilised for foundation design. Employer is requested to confirm on Bidders understanding.	

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685.	SECTION – VI, PART-A	SUB-SECTION-III-A6 ZLD	1.01.00	1 of 3 Pre treatment system shall consist of FGD waste water storage tank (2x50%) to store FGD waste water, GGH washing water, etc. Contractor shall provide one independent train (1x100%) or two independent trains (2x50%) of Evaporative concentration system.	Bidder proposes 1x100% tank sized for 30 m3/h inflow (Barh-I) and 20 m3/h inflow (Nabinagar) instead of 2x50% tanks. Please confirm. We propose 1x100% Evaporative Concentration System.	Stipulation of technical specification is clear. Bidder to comply with technical specification requirements. Stipulation of technical specification is clear. Contractor shall provide one independent train (1x100%) or two independent trains (2x50%) of Evaporative concentration system.
686.	SECTION – VI, PART-A	SUB-SECTION-III-A6 ZLD	1.02.00	1 of 3 FGD waste water pipes shall terminate along with isolation valve at 5 meters near HCSD mixing tank Waste Water: The contractor guarantees that the maximum purge flow rate to waste water treatment system for the complete plant shall be 10 m3/h averaged over a 24 hour period for each unit.	Please confirm the terminal points along for outlet of the ZLD system- Water and Solids respectively Please clarify the exact flow rate to be considered for designing the ZLD considering 3x660 MW Barh plant and 4x250 MW BRBCL Nabinagar plant.	Stipulation of technical specification is clear. Bidder to comply with technical specification requirements. Bidder to refer necessary amendment in this regard.
687.	SECTION – VI, PART-A	SUB-SECTION-IV Terminal Points & Exclusions	1.08.00	2 of 3 Conditions of Service - 'All Design Pressure of all device, piping, and auxiliary facilities... Device and tank maximum allowance: operating pressure x 1.5' and also 'piping	This may not apply for larger "fit for service" equipment like Evaporators and Crystallizers. We will provide our recommendations on design pressures for piping and	Technical specification requirement is clear. However, for evaporator & Crystallizer, proven design and experience meeting provenness criteria specified in tender is acceptable.
688.	SECTION – VI, PART-A	SUB-SECTION-IV Functional Guarantees & LD	4.02.00	18 of 24		
689.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	2.00.00	3 of 32		

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				ing and auxiliary facilities: 150 lb class flange, STD wall pipe'	tanks in our offer based on our proven experience. Please confirm	
690.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	E 2	Evaporative concentrator shall be designed to start / stop every day	Please clarify why this requirement is made. We presume FGD & ZLD will operate continuously.	Bidder shall comply Technical specification requirement.
691.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	E 6	Pressure vessel in evaporative concentration shall be designed as per ASME Sec VIII or equivalent code listed above.	Kindly confirm that the design shall be as per ASME Sec VIII. & no other stamping and manufacturing requirements shall be applicable.	Bidder shall comply Technical specification requirement.
692.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	E 15	Vessel support shall be designed same as materials for vessel. Different material cannot be welded to vessel.	It is common practice to provide dissimilar materials for vessel supports. Bidder requests Owner to approve as per proven practice	Bidder shall comply Technical specification requirement.
693.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	F 2	Centrifuge to dehydrate solids form evaporative concentration shall be consist of Centrifuge 2x50%	Centrifuge does not 'dehydrate solids' it makes wet cake or solids suitable for landfill.	Vessel support arrangement as per proven practice of OEM is also acceptable which shall be finalized during detail engineering.
694.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	22 d	Size: 1/2%-inchOD minimum	Our minimum is 1/4" OD tube. Kindly accept.	Bidder shall comply Technical specification requirement.

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695.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	3.02.01 4)	15 of 32	...the contractor shall provide duplicate pumps (2x100%) or multiple standby pumps for the same service.	Duplicate pumps are not needed for all pumps. We will propose in our offer the applicable connected redundancies and store standbys.	This shall be finalized during detail engineering.
696.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	3.02.03 2)	20 of 32	Slurry tanks shall be provided with screen at the inlet nozzles.	This is not our practice. Screens if required will be provided to protect downstream equipment (such as heat exchangers) as per our proven experience.	Electrically driven lube oil pumps as per the proven practice of OEM is also acceptable which shall be decided during detailed engineering.
697.	SECTION – VI, PART-B	SUB-SECTION-I-M7 ZLD	3.02.05 6)	20 of 32	Additional required equipment for Vapour Compressor : i) Shaft driven lube oil pump	Kindly accept electrically driven lube oil pump due to limitations in design of certain compressor manufacturers	As mentioned in Cl. No. 2.00.00 D, Sub-section I-M7, Part-B, Auxiliary steam if required shall be provided by owner for start-up condition only. For continuous duty, Bidder to design the various systems considering power driven equipment and the same shall be considered in power guarantee.
698.	Process Flow Diagram	ZLD		3 of 3	General Point	The scheme shows steam driven crystallizer, whereas write up calls for MVR. Please clarify.	Stipulation of technical specification is clear. Bidder to comply with technical specification requirements.

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699.	SECTION – VI, PART-B	SUB-SECTION - I-M7, Zero liquid discharge system	G)3	11 of 32	Bidder understands that their (Bidders) battery limit starts from connection flange to connect the chemical transport vehicles	Bidder understands that their (Bidders) battery limit starts from connection flange to connect the chemical transport vehicles. From chemical vehicles chemicals will be transported to Chemical storage tanks, then dissolving tank chemicals will be sent to injection tank. Employer to confirm on Bidders understanding and Employer is requested to put these points in the Terminal Point & Exclusion chapter of Part-A, Section-VI Further Employer to clarify the distance of chemical vehicles from chemical storage tank.

SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS

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700.	Section - VI, Part - A	Sub Section - I	8 of 19	4.01.02	In case the Bidder or the proposed sub-vendor is not manufacturer of proven Booster Fans as per clause 4.01.01 (a) above but is a manufacturer of such equipment for units of at least 500 MW rating, the Bidder or the proposed sub vendor can manufacture such equipment for 800 MW units also.	In case the Bidder or the proposed sub-vendor is not manufacturer of proven Booster Fans as per clause 4.01.01 (a) above but is a manufacturer of such equipment for units of at least 500 MW rating, the Bidder or the proposed sub vendor can manufacture such equipment for 800 MW units also.	Bidder to refer clarifications being issued separately.
701.	SECTION – VI, PART-A	SUB SECTION-III-A1	4 of 9	5.01.00	The employer envisages a common gypsum dewatering system for all the units.	We understand that Bidder scope included common gypsum dewatering system upto gypsum discharge from vacuum belt filter to Employers conveyor. Please clarify the scope.	Specification requirement is clear. Bidder shall comply with the specification requirements.
702.	SECTION – VI, PART-A	SUB SECTION-III-A1	5 of 9	5.04.00	2x100% pump shall be provided to supply wash water (for cake washing as well as belt cloth washing) to the belt filters.	Since the water collected in the filtrate tank from various source/equipment is an contaminated water, hence the same can not be used for Cake washing, for cake washing only clarified water will be used. Please check and confirm.	Bidder's understanding is correct.

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703.	SECTION – VI, PART-A	SUB SECTION-III-A1	5 of 9	7.00.00	PROCESS WATER & COOLING WATER STORAGE & PUMPING SCHEME (FOR 2X800 MW)	In the reference clause process and cooling water requirement is specified only for 2x800 MW plants only, where as there is 3x800 MW of Kudgi-I, 2x660 MW of Mouda-II, Solapur-II, Tanda-II & Mejra-I, 3x660 MW of Nabinagar - I & Barh-I and 4x250 MW of Nabinagar is also there. Hence we understand that the Process & Cooling water storage and pumping system described in reference clause is common for all the plants. In that case bidder to consider One (1) No. process water along with 2x100% process water pump and 2x100% Mist Eliminator wash water pump for each unit. In addition to above bidder to consider 2x100% Booster water pump common for each plant to pump the process water from Employer's terminal point. Kindly confirm.	Specification requirement is clear.
704.	SECTION – VI, PART-A	SUB SECTION-III-A1	6 of 9	7.01.01	2x100% Process Water Pumps for each unit connected to each of the Process water Storage tanks (total 4 nos. of pumps for 2x800 MW) along with all necessary piping, valves, control & instrumentation. Each pump catering to process water requirement of	Please note that in the Flow Diagram Dwg No. 0011-109-POM-A-003, Rev. A, only One (1) No. of Process water pump is indicated for each process water tank (i.e. total Two (2) no. of process water tank for complete plant), but in the reference clause Two (2) Nos process water pumps are specified for each process water tank. Please clarify the	Specification requirement is clear.

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					one unit.	discrepancy.	
705.	SECTION – VI, PART-A	SUB SECTION-III-A1	6 of 9	7.02.00	2x100% Mist Eliminator Wash Water Pump for each unit connected to each of the Process water Storage tanks (total 4 nos. of pumps for 2x800 MW) along with all necessary piping, valves, control & instrumentation.	Please note that in the Flow Diagram Dwg No. 0011-109-POM-A-003, Rev. A, only One (1) No. of Mist Eliminator wash water pump is indicated for each process water tank (i.e. total Two (2) no. of Mist Eliminator wash water pump for complete FGD system), but in the reference clause Two (2) Nos Mist Eliminator wash water pumps are specified for each process water tank. Please clarify the discrepancy.	Specification requirement is clear.
706.	SECTION – VI, PART-A	SUB SECTION-III-A1	9 of 9	25.00.05	A common Nickel based alloy material storage/neutralizing tank for the both the units of storage capacity of 12 hrs of stack condensate of both the stack shall be provided.	In case of Three (3) or Four (4) Units ? Howmany neutralising tanks to be considered. Please clarify.	Bidder to refer necessary amendment in this regard.

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707.	SECTION – VI, PART-A	SUB SECTION-III-A1	9 of 9	25.00.05	A common Nickel based alloy material storage/neutralizing tank for the both the units of storage capacity of 12 hrs of stack condensate of both the stack shall be provided.	Please confirm that for each plant bidder to consider only one (1) Common storage/neutralizing tank. No Standby tank is required.	Bidder to refer necessary amendment in this regard.
708.	SECTION – VI, PART-A	SUB SECTION-III-A1	9 of 9	25.00.05	Storage tank/neutralization tank shall be complete with dosing, mixing and preparation system.	Please clarify the dosing/neutralization system to be considered by bidder. Also please clarify the criteria/limitations for discharging stack condensate after neutralization in common drain system. Also please clarify the co-ordination point of common drain system.	Bidder to refer necessary amendment in this regard.
709.	SECTION – VI, PART-A	SUB SECTION-III-A2 - AC, Centilation and Compressed air system	3 of 4	3.00.00	Compressed Air System	Please clarify the location of Instrument air and Service air compressor to be considered by bidder.	The location of instrument air and service air compressor shall be finalized during detailed engineering while considering the bidder requirements.
710.	SECTION – VI, PART-A	SUB SECTION-III-A2 - AC, Centilation and Compressed air system	3 of 4	3.00.00	a) Two (2) numbers (1 working+ 1 standby) oil free, rotary screw type air compressors for Instrument air and service air applications for FGD and ZLD plant (if provided) each of adequate capacity & adequate pressure,	Please clarify whether the compressor quantity (i.e. 2 Nos) specified is common for all unit of plant or for each unit.	Compressor quantity is common for all unit of plant i.e, provided on station basis.

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711.	SECTION – VI, PART-A	Sub Section: III-A4 Equipment Cooling Water System	1 OF 3	1.01.00	(a) One cold water header tapped from CW Blowdown from CW pump discharge pipe.	Please furnish the water quantity available at cooling water discharge pipe. Also please furnish the Water analysis details.	Bidder may please refer annexure-II, page no 16 of 16, Sub section-I-M5 for available water quantity.
712.	SECTION-VI, PART-A	SUB-SECTION-IV, Terminal Points and Exclusions	2 of 3	1.05.00	For FGD system, Contractor shall take a tap off suitably from the existing CW blow down header available near the CW pump house. The pressure available at TP will be 1.9 Ksc (gauge) wrt FGL (approx..).		Bidder to refer Design water analysis provided in the Technical specification.
713.	SECTION – VI, PART-A	Sub Section: III-A4 Equipment Cooling Water System	1 OF 3	1.01.00	(e) 5 x 33.33% (3 Working + 2 standby) capacity FGD Auxiliary (Secondary) Cooling water pumps, along with drives. (f) 4 x 33.33% (3 Working + 1 standby) capacity FGD DM (Primary) cooling water pumps along with drives.	Please clarify whether bidder to consider any Margin on Flow and Friction loss to be considered by bidder while sizing the specified pumps.	Bidder may please refer clause no 4.00.00 sizing/design criteria, part-B, Sub section I-M5 for pump sizing. Bidder may please refer scope of supply and services indicated on Page 3 of 3,

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714.					Equipment Cooling Water System	Please note that Equipment cooling water system for 2X660 MW Solapur-II is not specified in the specification. Please clarify whether NTPC is providing Equipment Cooling Water. If yes, please furnish the quantity, pressure and temperature availability at terminal points and terminal point.	Sub Section IIIA-04 for Solapur, scope of supply and services.. For quantity of cooling water Bidder may please refer annexure-II, page no 16 of 16, Sub section-I-M5 for available water quantity. Terminal pressure available at TP will be 1.9 Ksc (Gauge) wrt FGL (Approx). May please refer clause no 1.05.00, page 2 of 3 of sub section IV, Terminal point and exclusion. Temperature at terminal point will be "Not less than 36 Deg C", bidder may refer clause no 4.02.00 a). of sub section I-M5 page no 7 of 16

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715.	SECTION – VI, PART-A	SUB-SECTION-III-A5 Lime-stone & Gypsum Handling Plants	2 of 6	2.01.00	Limestone Handling Plant (LHP)	Please furnish the Flow diagram for Lime Handling Plant to enable us to understand the requirement and Furnish the same.	Space available for FGD and associated system is marked in the General Layout Plan drawings attached with the Technical Specifications. Bidder has to propose the layout and Lime-stone Flow Diagram for LHP & GHP to cater the requirement of FGD plant based on the layout of FGD system and existing facilities.
716.	SECTION – VI, PART-A	SUB-SECTION-III-A5 Lime-stone & Gypsum Handling Plants	2 of 6	2.01.01	Two (2) numbers Box Feeders/ Bulk material Receiving Unit/ Underground Truck Unloading Hopper / Surface feeder	Please clarify whether bidder to consider any minimum storage capacity of Box Feeders/ Bulk material Receiving Unit/ Underground Truck Unloading Hopper / Surface feeder.	Bidder may refer Amendment to the subject clause for clarity in this regard.
717.	SECTION – VI, PART-A	SUB-SECTION-III-A5 Lime-stone & Gypsum Handling Plants	3 of 6	2.01.08	Junction towers (along with underground / over ground RCC structures),	We request you kindly accept Steel structures for overground steel structures and also junction towers.	Technical Specifications is clear. Bidder shall comply.

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		Plants					
718.	SECTION – VI, PART-A	SUB-SECTION-III-A5 Lime-stone & Gypsum Handling Plants	5 of 6	2.01.28	Minimum one (1) no. Weighing Bridge for Road trucks / Tipplers shall be provided each in Lime-stone unloading area and in Gypsum Loading area.	Please furnish the type and capacity of weigh bridge to be considered by bidder.	Weigh bridge capacity shall be 100 MT.
719.	SECTION-VI, PART-A	SUB SECTION-III-A6, ZLD	1 OF 3	1.01.00	Pre-treatment system shall consist of FGD waste water storage tank (2x50%) to store FGD wastewater, GGH washing water etc.,	Please note that GGH is not applicable for the proposed FGD system. Hence the same will not be considered for ZLD design. Kindly confirm.	Bidders understanding is correct. NO GGH envisaged.

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720.	SECTION-VI, PART-A	SUB-SECTION-IV, Terminal Points and Exclusions	1 of 3	1.04.01	Contractor shall take a tap off suitably from the existing DM normal make up header (DM normal make up pump discharge) available along C-row at CD bay rack for meeting the makeup water requirement of ECW system. The pressure available at TP will be 4Ksc (gauge) wrt FGL (approx.).	Please furnish the water quantity available at Employer's Terminal point. Also please furnish the Water analysis details.	ECW (primary circuit) is a closed system and only DM water make up will be provided. Quantity for the same will be arrived upon during detail engg.. Bidder to refer Design water analysis provided in the Technical specification.
721.	SECTION-VI, PART-A	SUB-SECTION-IV, Terminal Points and Exclusions	2 of 3	1.04.02	Contractor shall take a tap off suitably from the existing DM Emergency make up header (condensate transfer pump discharge) available along C-row at CD bay rack for meeting the emergency make up water requirement of ECW system. The pressure available at TP will be 4 Ksc (gauge) wrt FGL (approx.).	Please furnish the water quantity available at Employer's Terminal point. Also please furnish the Water analysis details.	ECW (primary circuit) is a closed system and only DM water make up will be provided. Quantity for the same will be arrived upon during detail engg.. Bidder to refer Design water analysis provided in the Technical specification.

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722.	SECTION-VI, PART-A	SUB-SECTION-IV, Terminal Points and Exclusions	2 of 3	1.06.00	For Gypsum washing, Contractor shall take a tap off suitably from the existing HVAC header (HVAC make up pump discharge) available along C-row at CD bay rack for meeting the water requirement of Gypsum washing. The pressure available at TP will be 4Ksc (gauge) wrt FGL (approx.).	Please furnish the water quantity available at Employer's Terminal point. Also please furnish the Water analysis details.	Water quantity available at Employer's terminal point is 20m ³ /h. Bidder may please refer amendment.
723.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data	1 of 26	1.00.00 (For various MW Plant)	Flue gas Composition at FGD System Inlet (Design Point)	Please note that the total flue gas composition specified for Design Point in the reference clause is less than <100% and moisture (H ₂ O)-3.958% indicated appears to be on low side. Please check and confirm.	Bidder to refer Design water analysis provided in the Technical specification. Refer necessary amendment in this regard.
724.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data	1 of 26, 3 of 26, 5 of 26 and 7 of 26	1.00.00, 2.00.00, 3.00.00 and 4.00.00	Nox: < 100mg/Nm ³ at 6% O ₂	Please clarify wet or dry	The value indicated is at 6% O ₂ (dry).
725.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data	1 of 26, 3 of 26, 5 of 26 and 7 of 26	1.00.00, 2.00.00, 3.00.00 and 4.00.00	ix) SO ₃ (PPM)	Please clarify whether the SO ₃ indicated in reference clause are at dry condition (or) Wet condition. Also please clarify whether the SO ₃ value indicated are at actual O ₂ or at 6% O ₂	The value indicated are at actual O ₂ at Wet condition. Bidder shall comply with the requirements of the technical specification.

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726.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data	1 of 26, 3 of 26 5 of 26 and 7 of 26	1.00.00, 2.00.00, 3.00.00 and 4.00.00	x) HCl (PPM) Wet = 45 (in Both guarantee point and Design point)	Please note that the HCl value indicated for various projects are seems very high. We request you to kindly check and confirm. Further please clarify the value indicated at actual O ₂ or at 6% O ₂ .	The value indicated are at actual O ₂ . Bidder shall comply with the requirements of the technical specification.
727.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data	1 of 26, 3 of 26 5 of 26 and 7 of 26	1.00.00, 2.00.00, 3.00.00 and 4.00.00	x) HF (PPM) Wet = 12 (in Both guarantee point and Design point)	Please note that the HF value indicated for various projects are seems very high. We request you to kindly check and confirm. Further please clarify the value indicated at actual O ₂ or at 6% O ₂ .	The value indicated are at actual O ₂ . Bidder shall comply with the requirements of the technical specification.
728.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data	3 of 26 and 5 of 26	2.00.00 3.00.00	Meja - I 2X660 MW	It may please be note that in Salient Design Data the Flue gas parameters for 2x660 MW Meja - I are specified in two different clauses. Please clarify the discrepancy.	Refer necessary amendment in this regard.
729.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data & Sizing	2 of 26, 3 of 26 5 of 26 and 7 of 26	2.00.00 3.00.00	Viii) Dust (mg/Nm ³) - 200 at design point	It may please be noted that the flue gas dust of 200 mg/NM ³ specified in reference clause seems very high. Kindly once again check and confirm. Further please clarify the value indicated at actual O ₂ or at 6% O ₂ .	The value indicated is at 6% O ₂ (dry). Bidder shall comply with the requirements of the technical specification.

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730.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data & Sizing	8 of 26	5.01.00	The Contractor, shall take into account the entire characteristics of expected combination of fuels to be fired, for the complete load range of operation and the expected numbers of Steam Generator start-ups while designing the Chimney flue liner considering Steam Generator in operation both with & without FGD system in operation.	Please note that while the FGD system is bypassed the flue gases from SG will be evacuated through the existing stack. Wet chimney will be used only when the FGD system is in operation. Hence, stack need not be designed for the conditioned mentioned in the referred clause. Please check and confirm.	Noted.
731.	SECTION-VI, PART-A	SUB-SECTION-V, Salient Design Data & Sizing	25 of 26	11.01.00	The rated capacity of all gypsum handling conveyors shall be 150TPH.	Please note that since the Gypsum handling/Conveying system is an continuous operating system, Gypsum handling conveyor capacity (150 TPH) indicated seems very High. The Gypsum handling conveyor will be designed based on the gypsum discharging from the Vacuum Belt Filter outlet. Kindly confirm.	Technical Specifications is clear. Bidder shall comply.
732.	SECTION-VI, PART-A	SUB-SECTION-VI Functional Guarantees & Liquidated Dam-	20 of 24	5.00.00	AUXILIARY POWER CONSUMPTION (PA) FOR EACH PROJECT	Shop test or at site ?	Bidder shall note that for the AUXILIARY POWER CONSUMPTION (PA) FOR EACH PROJECT, test and measurements will be done at site.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
		ages					
733.	SECTION-VI, PART-A	SUB-SECTION-VII Mandatory Spares	11 of 61	1.18.00	Goods Cum Passenger Elevator	Please note that the Mandatory spares for Elevators are specified in two (2) Different clauses. Please clarify the requirement of spares for Elevator in Lime & Gypsum Handling System specified under Cl. No. 1.24.00. In the the technical specification Goods Cum Passenger Elevator are specified for Lime Handling and Absorber area.	Technical specification is clear. Bidder to follow Cl.1.24.00 of Sub-section VII, Section VI, Part A of the technical specifications for elevator for Limestone Handling Plant.
			42 of 61	1.24.00	Limestone & Gypsum Handling (R) Elevator		
734.	SECTION-VI, PART-B	SUB-SECTION-I-M1	2 of 51	1.03.02	Motorized Guillotine type gates has be provided at (i) hot gas inlet to Booster Fans, (ii) Outlet of Booster Fans and (iii) in the by-pass duct (common Flue Gas Duct going towards the existing Chimney).	Please note that in the Flow Diagram {Dwg No. 011-109-POM-A-001 and Dwg No. 011-109-POM-A-001(a)} each Motorized Guillotine type gates are indicated with 2x100% seal air fans, but in the reference clause the seal air fan is specified only for Bi-plane type dampers. Please clarify whether bid-	Bidder shall comply with tender drawing and provide Guillotine type gates with 2x100% seal air fans. Bidder to refer necessary amendment in this regard.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
	SECTION-VI, PART-B	SUB-SECTION-I-M1	7 of 51	3.03.08	The Guillotine gate type dampers mentioned at Clause No. 3.03.01 above shall have a guaranteed gas tightness efficiency (on flow) of not less than 99.95% along the duct as well as from the duct to atmosphere or from atmosphere The bypass damper shall have a guaranteed gas tightness efficiency (on flow) of not less than 99.5% and 100% leak tight with seal air fans under operation.	der to consider the Seal air fans for Bi-plane type dampers only or for both Bi-plane type and Guillotine type dampers.	
735.	SECTION-VI, PART-B	SUB-SECTION-I-M1	5 of 51	2.00.00	The complete installation of liners shall be made under the supervision of the liner supplier as per their guidelines	Liner material manufacturers do not undertake the responsibility of supervision of application/ execution. We can follow manufacturers guide lines for application. Please check and confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.
	SECTION-VI, PART-B	SUB-SECTION-I-M1	6 of 51	3.02.05	Bidder to note that application of lining material in the duct shall be carried out under supervision of Designer/ Manufacturer.		
736.	SECTION-VI, PART-B	SUB-SECTION-I-M1	8 of 51 and 10 of 51	4.01.01 (3) (i) and 4.02.00 (ii)	(ii) Flue gas flow through each fan	It may please be note that the Flue gas flow rate in the reference clause are not matching with the Flue gas data mention in salient design data and Sizing. Please calrify the discrepancy.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
737.	SECTION-VI, PART-B	SUB-SECTION-I-M1	10 of 51	4.02.00	(iii) Margin over flow - 20%	Please clarify whether bidder to consider the margin overflow on Guaranteed Flue gas flow rate or Design Flue gas flow rate.	Specification requirement is clear. Bidder shall comply with the specification requirements.
738.	SECTION-VI, PART-B	SUB-SECTION-I-M1	10 of 51	4.02.00	(iv) Margin over pressure requirement - 44% over the calculated value	Please confirm that bidder to consider margin over pressure requirement of 44% over the calculated value i.e. on the actual flue gas flow rate (Without any margin on flue gas flow rate)	Specification requirement is clear. Bidder shall comply with the specification requirements.
739.	SECTION-VI, PART-B	SUB-SECTION-I-M1	12 of 51	4.07.00	(b) Fan control system - ii) The final control element shall not have any backlash, plays etc., and shall operate in the range of 20% to 80% depending upon generating loads upto Boiler MCR	Please furnish the BMCR load data. The same is not attached with the specification.	Specification requirement is clear. Bidder shall comply with the specification requirements.
740.	SECTION-VI, PART-B	SUB-SECTION-I-M1	14 of 51	5.01.00	(iii) The slurry recirculation pumps shall have a minimum margin of 10% on flow and 10% on frictional head, over the actual requirement for meeting the guarantee and design point conditions.	Kindly note that our technology partner do not recommend any margin on the flow and head as this will affect mass balance. Please check requirement.	Specification requirement is clear. Bidder shall comply with the specification requirements.
741.	SECTION-VI, PART-B	SUB-SECTION-I-M1	14 of 51	5.01.00	V) Minimum 10% spare nozzles shall be provided at each level.	It may please note that 10% of spare nozzles for each spray level is not applicable for our design. Hence please confirm that the same shall be as per Bidder's design	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
						standard.	
742.	SECTION-VI, PART-B	SUB-SECTION-I-M1	16 of 51	5.03.03	Oxidation nozzles / spargers shall have a minimum redundancy of 10% or as per the contractor's proven practice whichever is maximum.	Please note that we are supplying lance type oxidation air system (one (1) lance for each agitator) 10% margin on oxidation air nozzle is not applicable for our design. Hence please confirm that the margin for oxidation nozzles will be applicable as per bidder design standard.	Specification requirement is clear. Bidder shall comply with the specification requirements.
743.	SECTION-VI, PART-B	SUB-SECTION-I-M1	25 of 51	7.03.01	Each set of primary dewatering hydro cyclone shall be sized to dewater the gypsum slurry produced by the unit operating at Design point with an additional 10% margin.	Please confirm that primary hydrocyclone is common for all the units the same shall be sized to dewater the gypsum slurry produced by all the units operating at design conditions.	Bidder's understanding is correct. Refer necessary amendment in this regard.
744.	SECTION-VI, PART-B	SUB-SECTION-I-M1	25 of 51	7.04.01	Each vacuum belt filter shall be sized to meet the following requirements, all occurring together, with an inlet solid concentration of not more than 45% or outlet of hydro-cyclones whichever is minimum:	Please note that the solid concentration of gypsum underflow from Primary Hydro-cyclone (i.e. inflow to the Vacuum belt filter) will be 50% as per our design standard. Kindly confirm.	NTPC noted. Will be discussed during detail engg..

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
745.	SECTION-VI, PART-B	SUB-SECTION-I-M1	29 of 51	7.08.02	The contractor shall provide 2 x100% pump to pump back the slurry from the sump back to the absorber in a maximum time of 8 hours.	Please note that slurry pump quantities are different in the referred clauses. Please check and clarify.	Bidder to refer necessary amendment in this regard.
	SECTION – VI, PART-A	SUB SECTION-III-A1	5 of 9	6.02.00	The contractor shall provide 1x100% slurry pumps for pumping the slurry back to the absorber of any of the units in 8 hrs (max.).		
746.	SECTION-VI, PART-B	SUB-SECTION-I-M1	30 of 51	8.04.00	All the slurry pumps shall be provided with motorized suction and discharge valves. In addition, flushing water lines with motorized valves shall be provided for each pump for automatic flushing of the pump after each shut down.	Please note that in the Flow Diagram {Dwg No. 011-109-POM-A-001 and Dwg No. 011-109-POM-A-001(a)} Pneumatic operated valves are indicated for Flushing water line but in the reference clause Motor operated valves are specified. Please clarify the discrepancy.	Specification requirement is clear. Bidder shall comply with the specification requirements.
	SECTION-VI, PART-B	SUB-SECTION-I-M1	16 of 51	5.03.04	The oxidation system shall be complete with a quenching system to cool down heated oxidation air in order to prevent any scaling or buildup that could occur at the sparger tips due to localized evaporation of recycled slurry.		
747.	SECTION-VI, PART-B	SUB-SECTION-I-M1				We are providing lance type oxidation system which do not require quenching system for oxidation air. Please review and confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
748.	SECTION VI, PART-B	SUB-SECTION-I-M1	16 of 51	5.04.00	Margins : Flow – 15%, Head – 20%	The flow and head of the Gypsum bleed pumps are dependent on the system requirement. We do not recommend provision of any margin on the flow or head of the pumps. Please check your requirement.	Specification requirement is clear. Bidder shall comply with the specification requirements.
749.	SECTION VI, PART-B	SUB-SECTION-I-M1	16 of 51	5.04.00	The pumps shall be designed to meet the stipulations of Clause No.9.00.00 of this Sub-Section.	Please note that in Cl. No. 9.00.00 of this section the stipulations are specified for vertical pumps but the Gypsum bleed pumps are Horizontal centrifugal type. Please clarify the requirement.	Specification requirement is clear. Bidder shall comply with the specification requirements.
750.	SECTION VI, PART-B	SUB-SECTION-I-M1	16 of 51	5.05.00	An emergency cooling system for automatic spray of quenching water for a sufficient time (minimum 15 min) at the inlet to the absorber, in case the gas temperature exceeds the design temperature due to failure of upstream equipment's shall be provided to protect the FGD and all other sensitive downstream equipment against high flue gas temperatures.	Since Absorber is being provided with alloy steel liner which can withstand temperatures, the requirement of emergency cooling system shall be reviewed.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
751.	SECTION VI, PART-B	SUB-SECTION-I-M1	17 of 51	5.06.06	Three stage chevron type Mist Eliminators (ME) made of polysulfone or stainless steel shall be provided at the exit of the absorber.	We recommend polypropylene (PP) made Mist Eliminator elements/lamellas and frames as per manufacturers standard and which are installed at many FGD plants around the world and performing well. Please confirm that M/s NTPC will accept the polypropylene Mist Eliminator elements/lamellas.	Specification requirement is clear. Bidder shall comply with the specification requirements.
752.	SECTION VI, PART-B	SUB-SECTION-I-M1	19 of 51	5.06.17	Nozzle pipes and slurry spray nozzles shall be with bolted flanged connections.	We understand that Nozzle pipes with bolted connections is applicable only if the bidder provides spray banks with carbon steel piping and rubber lining and not for FRP spray header pipes. Please check and confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.
753.	SECTION VI, PART-B	SUB-SECTION-I-M1	22 of 51	6.03.06	For each bunker facilities shall be provided for unloading the bunker, through feeder, to a truck at ground level, along with all necessary chutes and diversion chutes.	Please furnish the details of truck unloading equipments to be considered by bidder for more clarity.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
754.	SECTION VI, PART-B	SUB-SECTION-I-M1	22 of 51	6.05.01	(ii) Flow 110% of limestone requirement of two absorbers at Design point	Please note that as per referred clause, each wet ball mill has to be sized for 110% of limestone requirement of two absorbers and 2 x 100% wet ball mills to be provided. This is applicable for the plants where there are two units only. Please clarify the quantity of wet ball mills to be considered where no. of units are three (3) and four (4).	Common 2X 100% Wet ball mill for all the units in a plant.
755.	SECTION VI, PART-B	SUB-SECTION-I-M1	25 of 51	7.04.01	Each vacuum belt filter shall be sized to meet the following requirements, all occurring together, with an inlet solid concentration of not more than 45% or outlet of hydro-cyclones whichever is minimum:	Please note that the solid concentration of gypsum underflow from Primary Hydrocyclone (i.e. inflow to the Vacuum belt filter) will be 50% as per our design standard. Kindly confirm	Noted.
756.	SECTION VI, PART-B	SUB-SECTION-I-M1	26 of 51	7.04.01	c. Gypsum Purity 90% (minimum)	It may please be note that since in the tender document Section - VI, Sub section -V, Salient design data & sizing in Note-1 under Cl. No. 6.00.00, the guarantee parameters shall be based on available (reactive) CaCO3 content of 89% and The design of FGD system and auxiliaries reactive CaCO3 content of 79% are specified.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
757.	SECTION VI, PART-B	SUB-SECTION-I-M1	26 of 51	7.04.03	Gypsum cake from each belt filter shall be discharged through a hopper onto belt conveyor being provided by the Employer.	Please note that in the Sub Section - IV, terminal point, under Clause No. 1.10.00 it is specified that bidder's terminal point is upto outlet of Gypsum Storage silo/shed but in the reference clause it is specified that bidder scope is limited upto inlet of Employers gypsum conveyor. Please clarify the discrepancy.	Refer necessary amendment in this regard.
758.	SECTION VI, PART-B	SUB-SECTION-I-M1	29 of 51	7.07.09	The lime storage silo shall be of minimum 24 hr capacity equivalent to the requirements of FGD system of 2X800 MW at Design point and shall be complete with supporting steel structure, platforms, power operated outlet gates, level switches, air relief devices, etc..	Please note that in the reference clause the lime storage silo storage is specified only for 2x800 MW, whereas various plants are having 3x800 MW, 2x660 MW, 3x660 MW. Hence we understand that bidder to furnish Two (2) Nos 24 Hrs storage capacity lime storage silo common for all the units. Please confirm	Bidder's understanding is correct.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
759.	SECTION VI, PART-B	SUB-SECTION-I-M1	29 of 51	7.08.02	The contractor shall provide 2 x100% pump to pump back the slurry from the sump back to the absorber in a maximum time of 8 hours.	Please note that in the technical specification Sub Section - III-A1, Under Cl. No. 6.02.00, only one (1) Number of slurry pump is specified to pump back the slurry from the Auxiliary/ Emergency absorber tank to any of the absorber in maximum time of 8 Hrs. Please clarify the discrepancy and confirm the actual quantity of slurry pumps to be considered by bidder.	Bidder to refer necessary amendment in this regard.
760.	SECTION VI, PART-B	SUB-SECTION-I-M1	29 of 51	7.08.04	The Auxiliary Absorbent tank shall be made of minimum 7 mm thick carbon steel with minimum 4 mm thick rubber lining of best quality bromine butyl rubber....	We understand that Bidder to furnish the absorber oxidation tank, absorber tower with 2 mm (minimum) thickness lining / cladding / wall paper of Alloy C276 /Alloy 59 or better material, only the Auxiliary absorber tank shall be provided with 4mm thick rubber lining.	Specification requirement is clear. Bidder shall comply with the specification requirements.
761.	SECTION VI, PART-B	SUB-SECTION-I-M1	30 of 51	8.03.00	The slurry concentration in the pump shall not exceed 30% by weight except for Mill circuit slurry pumps for which the slurry concentration in the pump shall not exceed 55% by weight.	Please note that the concentration of mill circuit slurry pumps will vary from supplier to supplier. Hence please confirm that the concentration of Mill circuit slurry pumps will be as per Manufacturer standard.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
762.	SECTION VI, PART-B	SUB-SECTION-I-M1	30 of 51	8.09.00	The design of the shaft shall ensure that the operating speed is at least 20% above the critical speed of the shaft.	We understand that the slurry pump shaft should be designed to operate at critical speed which is 20% higher than the operating speed. Kindly confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.
763.	SECTION VI, PART-B	SUB-SECTION-I-M3	3 of 7	7.02.00	Air Drying (ADP) Plant may be of "Open Through type (Blower reactivated)" OR "Heat of (HOC) Compression type".	As per referred clause, both Blower Reactivated and HOC type ADP are acceptable. But, in Mandatory Spares, only spares for Blower Reactivated type ADP has been mentioned. Please clarify whether HOC type ADP is acceptable or not. If yes, please furnish the mandatory spares list for HOC type ADP.	As specified in referred clause, HOC type ADP is acceptable. Bidder to refer relevant amendment in this regard.
764.	VI A	III		1.06.00	First fill of Consumable, oil & Lubricants. All the first fill and one year topping requirement...	Lime stone & Chemicals shall be supplied by NTPC. Pl confirm	Specification requirement is clear. Bidder shall comply with the specification requirements.
765.		III-A5		2.01.01	Lime stone received thru Crusher house	Truck tippler are not required for self tipping Trucks. Please clarify that system should be designed considering Truck Tipplers or system to be designed considering non tipping Trucks	System shall be designed considering all types of trucks including self tipping trucks as specified in the technical specifications.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
766.		III-A6		1.01.00	Pretreatment system..... GGH washing	GGH is not applicable. Please confirm	Bidder's understanding is correct.
767.	VIB	VI		3.03.09	 GGH	GGH is not applicable. Please confirm	Bidder's understanding is correct.
768.					MEJA - General Layout Plan Drg No 0360-999-POC-F-001 Rev 6 D0	Space for FGD is not indicated. Kindly provide the same	Bidder to refer Amended GLP being issued separately.
769.						space for FGD is not indicated. Kindly provide for Nabinagar 3 x 660 MW also	Bidder to refer Amended GLP being issued separately.
770.	VI, PART-B	I-M7	5 of 32	B. 1)	The FGD wastewater treatment system shall be designed to treat the FGD waste water of all units of Plant for 24 hours continuous operation per day and seven (7) days per week except during annual cleaning period.	In both clauses, operating hours of waste water treatment plant are not matching. Please clarify the same, 16 hours or 24 hours.	Technical specification requirement is clear. Pretreatment facilities shall be designed to treat the FGD waste water generated for all units of Plant in 24 hours & any other waste water as envisaged by Bidder considering 16 hr of operating time. However, Evaporation concentration processes shall be designed considering 24 hours op-
	VI, PART-A	VI	20 of 24	xvii) of 4.00	C). Operating time : 16hr for Pretreatment process, 24hr for Evaporation process		

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
771.	VI, PART-B	I-M7	6 of 32	12) of B	12) The Contractor shall design the FGD wastewater treatment system to the sludge quantity. The sludge from clarifiers shall be transferred to thickeners and reuse gypsum storage tank. The overflow of thickeners shall be transferred to the FGD wastewater tank/pond, and the thickened sludge shall be transferred to the filter press for sludge dewatering and reuse.	As per clause no. 12) of B, thickener is envisaged to increase sludge consistency before feeding to Filter press. However, in process flow diagram, thickener is not shown. Please clarify the requirement of thickener.	Thickener is envisaged in the scope of the Bidder. Process flow diagram is indicative Contractor to furnish the complete scheme & P&ID during detailed engineering meeting the specification requirements.
	PART-E				Process Flow Diagram for FGD Waste water treatment (FGD WWT) for ZLD Drawing no. 0011-109-POM-A-005 Thickener is not shown		erating time.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
772.	VI, PART-B	I-M7	11 of 32	2) of G.	2) The Contractor shall design chemical tanks as followings: a) Chemical storage tanks : 15 days b) Chemical dissolving tank : 3 days c) Chemical dosing/injection tank : 24 hours	We have considered that chemical storage tank, chemical dissolving tank and chemical dosing tank shall be located open dyke area. Please confirm.	This shall be decided during detailed engineering as per the proven practice of the contractor.
773.	VI, PART-A	IV	1 of 3	1.08.00	Terminal point of waste water	In the mentioned tender clause, scope of disposal of sludge/slurry generated from filter press and centrifuge are not specified. We understand that disposal of the same are in client scope. Please confirm our understanding.	Bidder's understanding is in order.
774.						As seen from the GLP of various projects the space earmarked for FGD system is less than the requirement. To accommodate FGD system, some facilities/ roads are to be relocated. Please confirm.	Bidder to refer amended GLP.
775.						Since space for Lime stone storage/handling system is not marked in any of plot plan attached with tender specifications, we assumed that space shown as future provision for coal stockpile/storage can be utilized for	Bidder to refer amended GLP.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
						limestone handling/storage system. Please clarify.	
776.						Please provide flow diagram of Limestone and Gypsum handling system for each project.	Space available for FGD and associated system is marked in the General Layout Plan drawings attached with the Technical Specifications. Bidder has to propose the layout and Limestone Flow Diagram for LHP & GHP to cater the requirement of FGD plant based on the layout of FGD system and existing facilities.
777.						In case of Truck Tippler, we have considered Vibrating feeder of unbalanced motor type below hopper. Please confirm.	Noted.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
778.	Sec-VI, Part-A	III-A5	2 of 6	2.01.02		As the limestone handling system shall be double stream up to limestone grinding building, please clarify whether a set of One Vibrating Grizzly feeder & One Impactor Crusher shall be considered for each incoming conveyor in Crusher House. So that one stream shall be 100% standby.	Noted.
779.						Incase lime stone receiving arrangement is through existing Wagon Tippler or Track hopper, please clarify whether existing equipment below Wagon tippler hopper or track hopper are suitable to handle the desired capacity of limestone and the same equipment shall be used as it is, need not to modify. Please clarify.	Confirmed.
780.						Please clarify whether sufficient spaces are available for tapping/receiving of limestone from the existing system.	Bidder to examine the feasibility.
781.	Sec-VI, Part-A	III-A5	2 of 6	2.01.00		Please refer cl. No. 2.01.00, page 2 of 6 of technical specification, section – VI, Part – A. Please indicate name of the projects where Truck unloading system only to be considered and name of the projects where existing Wagon tippler /	Technical Specifications is clear. Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
						Track hopper are only to be considered for receiving of limestone.	Road unloading facility shall be provided for all the plants under this package. Wherever feasible, railway unloading shall also be provided using existing Wagon Tippler / Track Hopper as detailed out in the Technical Specifications.
782.	Sec-VI, Part-A	III-A5	3 of 6	2.01.07		As the reclaiming capacity is less, please clarify whether limestone can be reclaimed from crushed limestone storage shed through traveling hopper (shall be provided over reclaim conveyor) with the help of pay loader.	Technical Specifications is clear. Bidder shall comply.
783.	Sec-VI, Part-A	III-A5	5 of 6	2.01.28		We understand weighing bridge is required for Road Truck only. For railway wagons, weighing bridge is already exists. Please clarify.	Confirmed.
784.						Please furnish AutoCAD version of GLPs for developing FGD and LHP & GHP system layouts	Only PDF provided.

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SL. No	SECTION	SUB SECTION	PAGE NO.	CLAUSE NO.	DESCRIPTION	QUERY	NTPC CLARIFICATIONS
785.	Sec-VI, Part-B	IV-D	11 of 69	3.14.01	The expansion joint in the flue liner shall A temperature of 300°C, shall be	Please note that wet chimney is stalled on downstream of absorber and will be operational while FGD is in service only and temperatures would be around 60-80°C only. Hence please review the temperature requirement for expansion joint.	Specification requirement is clear under the referred cl.no. 3.14.01 . Bidder to comply with the specification requirements.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
786.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	5.06.06	18 of 51	The mist eliminator wash piping shall be constructed of rubber lined carbon steel or glass fiber reinforced plastics.	Carbon steel pipe shall be selected for outside pipe up to the nozzles at Mist Eliminator casing. Inside the mist eliminator casing piping header shall be of FRP/CSRL as per tender specification.	Specification requirement is clear under the referred cl.no. 5.06.06 . Bidder shall comply with the specification requirements.
787.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	8.04.00	30 of 51	The flushing water for the pumps shall be taken from the process water supply	Bidder envisages to use reclaim water for the flushing of slurry pumps (3-5% slurry concentration) according to our collaborator proven practice.	Specification requirement is clear under the referred cl.no. 8.04.00 . Bidder shall comply with the specification requirements.
788.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	7.04.04	26 of 51	In case, the contractor offers a design with an underlying belt for carrying the filter cloth, the same shall be endless, factory vulcanized rubber belts.	The size of Vacuum belt filter will decide the extent of modularization and hence the final assembly requirement at site. This will in turn govern the requirement of site joint (vulcanized) for rubber belts.	Specification requirement is clear under the referred cl.no. 7.04.04. Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
789.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	6.02.02	21 of 51	The top of the unloading hopper shall be equipped with a grate to protect the downstream equipment from gravel lumps or tramp waste.	There is no unloading hopper in the lime storage silo, material is discharged to silos through the fixed tripper / plough provided above the silos. The line mentioned " The top of unloading hopper tramp waste" is not applicable for storage silos. Kindly confirm.	The referred cl.no. 6.02.02 is for the Limestone storage silo. The specified requirements shall be complied i.e. "The top of the Limestone storage silo shall be equipped with a grate to protect the downstream equipment from gravel lumps or tramp waste."
790.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	5.06.10	19 of 51	The raw gas inlet duct of the absorber shall be equipped with a flushing device of the side walls and the ground, which shall operate continuously as well as intermittently.	Bidder understands the gas cooling mechanism which is continuously operated and is provided in the raw gas inlet duct of absorber meets the requirement. Kindly confirm.	Specification requirement is clear under the referred cl.no. 5.06.10 . Bidder shall comply with the specification requirements.
791.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	7.07.06	28 of 51	pumping the waste water from waste water tank at required pressure to waste water terminal point.....	Kindly provide us the head required at waste water terminal point.	Bidder to decide the same based on the proposed and approved Layout during the detail engg..

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
792.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	5.06.11	19 of 51	The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct shall be provided with 2 mm (minimum) thickness lining l cladding l wall paper of Alloy C276 l Alloy 59 or better material.	Bidder proposes absorber vessel material as CS + FIRP (flake glass) Lining –3 mm Thick as per collaborator experience. Please confirm.	Specification requirement is clear under the referred cl.no. 5.06.11 . Bidder shall comply with the specification requirements.
793.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	6.02.06	21 of 51	For each silo facilities shall be provided for unloading the bunker, through feeder, to a truck at ground level, along with all necessary chutes and diversion chutes.	Kindly let us know the purpose of limestone unloading into a truck at the ground level. Also furnish the type of feeder to be considered, in case above is required. In general, Rotary air lock valve with the telescopic chute is required to load material on to trucks. Please clarify the requirement.	Specification requirement is clear under the referred cl.no. 6.02.06. Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
794.	SECTION – VI, PART-B / SUB- SECTION-I-M1 (FGD)	7.08.01	29 of 51	The Contractor shall provide an auxiliary absorbent tank, for the unit, sized to contain the complete slurry of one absorber tank at its maximum level equipped with all necessary pumps, valves, piping and controls to transfer the tank's contents back to the absorber to refill the absorber sump.	The two clauses are contradictory. Bidder understands that only one common auxiliary absorbent tank is required. Kindly clarify.	Bidder's understanding is correct.
795.	SECTION- VI, PART-A/ SUB SECTION-111-A1FGD	6.01.00	5 of 9	The employer shall provide a common auxiliary absorbent tank, common for all the units, of sufficient capacity for storage of absorber slurry of one unit.		

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
796.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	7.08.01	29 of 51	The Contractor shall provide an auxiliary absorbent tank, for the unit, sized to contain the complete slurry of one absorber tank at its maximum level equipped with all necessary pumps, valves, piping and controls to transfer the tank's contents back to the absorber to refill the absorber sump. It should be possible to discharge the each absorber into the emergency drain tank within 2 hours.	Draining of absorber using a pumping system is possible between normal slurry level and minimum slurry level. The balance slurry will be drained to the drain sump by gravity. Kindly confirm.	Noted.
797.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	12.02.00	33 of 51	All the pipes handling slurry shall be provided with replaceable rubber lining of proven quality. The Contractor can provide slurry pipes of size lower than 3" made up of FRP material (silicon carbide coating on slurry exposed surface) if it has previous experience of providing the same.	Bidder proposes FRP as alternative material for all sizes of slurry pipes, please confirm.	Specification requirement is clear under the referred cl.no. 12.00.00. Bidder shall comply with the specification requirements.
798.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	1.09.00	4 of 51	Noise level	Bidder understand that for ball mill noise level limit shall be <90 dB(A). Please confirm.	Bidder to refer necessary amendment in this regard.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
799.	SECTION – VI, PART-C / General technical requirements	30.00.00	42 of 83	Noise level <90 dB(A)		Bidder to refer necessary amendment in this regard.
800.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	3.01.00	5 of 51	Recirculation Slurry pH Not less than 5.5 under all operating conditions	This clause is not applicable to Jet Bubbling technology offered by the bidder. Please confirm.	Specification requirement is clear under the referred cl.no. 3.01.00 . Bidder shall comply with the specification requirements.
801.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	6.05.01	23 of 51	Limestone bond index(kWh/sh. T) 13 (min)	Bidder considers Limestone bond index as 13 kWh/metric ton. Please confirm.	Limestone Bond Index : 13 kWh/Sh.T (Min.) should be followed.
802.	SECTION-VI, PART-A/SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	6.00.00	10 of 26	Bond Index 13 kWh/t		
803.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	15.01.00	36 of 51	One (1) no. Passenger cum goods elevator per Absorber & for Mill Building	Bidder understands that passenger cum goods elevator of minimum capacity of 1000 kgs for each absorber shall be required only if height of absorber is higher	Bidder to refer necessary amendment in this regard.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
804.	SECTION – VI, PART-A / SUB-SECTION-III-A1 (FGD)	9.01.00	7 of 9	One (1) number passenger cum goods elevator of minimum capacity of 1000 kgs for each Absorber (to be provided in case height of absorber is higher than 20m)	than 20M.	
805.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	5.01.00 (iv)	14 of 51	The slurry recirculation pumps shall have motor driven knife gate valve at pump suction and discharge side.	Slurry recirculation pumps are not applicable to our offered system. The Gas Cooling pumps provided in our system shall have motor driven/pneumatic butterfly/knife gate valve.	Specification requirement is clear under the referred cl.no. 5.01.00 (iv). Bidder shall comply with the specification requirements.
806.	SECTION-VI, PART-A/ SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	6.00.00	10 of 26	Limestone characteristics CaO 47-51	Bidder will consider CaO of 51 % not only for guarantee parameters but also for our complete FGD system design. Please confirm.	Bidder's understanding is not correct. Bidder shall comply with the specification requirements at referred cl.no. 6.00.00 and relevant clauses of sizing & design in the tender specifications .
807.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	1.03.02	2 of 51	Motorized Guillotine type gates has be provided at.....(iii) in the bypass duct(common Flue Gas Duct going towards the existing Chimney).	Already a Bi-plane motorized/pneumatic is asked in the bypass duct in 3.03.01. Purpose of this Motorized Guillotine type gates damper to be clarified.	Specification requirement is clear under the referred cl.no. 1.03.02 . Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
808.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	5.01.00 B	14 of 51	However, 2x100% Cooling Pumps instead of Slurry Recirculation shall be provided. The spray headers & piping for cooling pump discharge shall be made of Alloy 59 or C276 and nozzles shall be made of Silicon Carbide or ceramic or equivalent having a minimum guaranteed life of 20,000 hrs	The slurry spray headers within the gas cooler shall be made of Alloy 59 or C276. The piping outside the gas cooler, which is not in contact with hot flue gas & slurry spray shall be CS with rubber lining. Kindly confirm	Specification requirement is clear under the referred cl.no. 5.01.00 . Bidder shall comply with the specification requirements.
809.	SECTION – VI, PART-A / SUB-SECTION-VI (FUNCTIONAL GUARANTEES)			Functional Guarantees & Liquidated Damages	General Comments: Detailed performance guarantee test requirements such as test duration, flue gas/limestone consumption measuring method, liquid/solid analytical method, evaluation method of collecting data are not mentioned in the tender document. Our understanding that bidder can propose performance guarantee test procedure during detail engineering stage in line with collaborator standard practice. Please confirm.	Specification requirement is clear under the referred SECTION – VI, PART-A / SUB-SECTION-VI (FUNCTIONAL GUARANTEES). Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
810.	SECTION- VI, PART-A/SUB SECTION-III-A1 FGD	6.02.00	5 of 9	The contractor shall provide 1 x100% slurry pumps...	The two clauses are contradictory. Kindly clarify.	Bidder shall provide 1x100% slurry pumps. Bidder to refer necessary amendment in this regard.
811.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	7.08.02	29 of 51	The contractor shall provide 2 x100% pump		
812.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	3.01.00	5 of 51	Inlet Dust Burden in Gas (mg/Nm3) 200	ESP is designed for outlet dust burden of less than 50 mg/Nm3 as per statutory requirements. Hence, inlet dust burden of 200 mg/Nm3 is rather high. Bidder requests to kindly review the same.	Specification requirement is clear under the referred cl.no. 3.01.00. Bidder shall comply with the specification requirements.
813.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	4.03.00	10 of 51	Fan component shall also be designed to withstand the excursions in flue gas temperature up to 300 degree Celsius, which may persist for about 30 minute duration.....	Bidder request NTPC to review this clause for fans as most of the suppliers are unable to meet the requirement.	Specification requirement is clear under the referred cl.no. 4.03.00. Bidder shall comply with the specification requirements.

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814.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	13.03.07	34 of 51	All the Process water tanks (Process water Storage tanks, Clarified water tank, Emergency water storage tanks etc.) shall be designed, fabricated, erected and tested in accordance with the IS:803, latest edition. Additional Corrosion allowance of 3mm on the minimum tank shell thickness.	The two clauses are contradictory. Bidder shall consider 1.5mm corrosion allowance. Please confirm.	Bidder to refer necessary amendment in this regard.
815.	SECTION – VI, PART-B SUB-SECTION-I-M1	13.01.00	33 of 51	Additional Corrosion allowance of 1.50 mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the bidder.		
816.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	3.01.00 (3)	5 of 51	The entire flue gas system, flue gas ducts, absorber etc. shall be designed to meet the following conditions: Short temp excursion temperature of inlet gas (for approx. fifteen (15) minutes at a time) (deg. C) 300	In case of offered technology, since the absorber is preceded by the gas cooling system (including emergency cooling water system), we don't envisage 300 Deg C excursion temperature at absorber. Hence this clause is not applicable for offered absorber.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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817.	SECTION-VI, PART-A/ SUB-SECTION-IV TERMINAL POINTS & EXCLUSIONS	1.06.00	2 of 3	For Gypsum washing, Contractor shall take a tap off suitably from the existing HVAC header (HVAC make up pump discharge) available along C-row at CD bay rack for meeting the water requirement of Gypsum washing.	Bidder requests NTPC to provide water analysis for gypsum washing requirement.	Bidder to refer Project information chapter for project specific details.
818.	SECTION – VI, PART-A / SUB-SECTION-II-A10 Project Information BARH STPP STAGE-I (3X660 MW)		28 of 30	Table-4	Bidder understands that table 4 is clarified water analysis. Please confirm. Bidder understands that COC of 5 shall be considered for arriving at CW blow down analysis for the design/guarantee of FGD.	Bidder's understanding is in order.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
819.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	1.03.06	3 of 51	The FGD and the ancillary facilities shall be suitable for unlimited operation with all transients and at any load point between the minimum and maximum load point of the Steam Generator. Further, the FGD plant shall be suitable for an unlimited operation at any pollutant concentrations between minimum and maximum without exceeding the emission values of SO ₂ emission of less than 100 mg/Nm ³ (6% O ₂ dry).	Bidder shall design considering Guarantee point is 100% TMCR & worst coal and corresponding SO ₂ removal efficiency is 96.55% and design point is VWO & worst coal and corresponding SO ₂ removal efficiency is 96.55%. In view of non availability of data between minimum and maximum load point of steam generator, bidder shall design FGD system and ancillaries and commit SO ₂ emissions less than 100 mg/Nm ³ with 6% O ₂ dry for the two points given above. Please confirm.	Specification requirement is clear under the referred cl.no. 1.03.06 . Bidder shall comply with the specification requirements.
820.	SECTION-VI, PART-A/ SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	1.00.00	1 of 26	Guarantee point is 100% TMCR & worst coal and corresponding SO ₂ removal efficiency is 96.55% and design point is VWO & worst coal and corresponding SO ₂ removal efficiency is 96.55%		Specification requirement is clear under the referred cl.no. 1.03.06 . Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
821.	SECTION-VI, PART-A/ SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	2.00.00	3 of 26	The Flue Gas Desulphurisation (FGD) System FOR MOUDA-11 2X660 MW, TANDA-11 2X660 MW, NABINA-GAR-1 3X660 MW, MEJA-1 2X660 MW & BARH-1 3X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below:	Please confirm for FGD system design which table shall be applicable for MEJA-1 2X660 MW.	Bidder to refer necessary amendment in this regard.
822.	SECTION-VI, PART-A/ SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	3.00.00	5 of 26	The Flue Gas Desulphurisation (FGD) System for SOLAPUR-11 2X660 MW & MEJA-1 2X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below:		Bidder to refer necessary amendment in this regard.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
823.	Section- IV, Sub section-II-E12	1.01.00		Outdoor transformers	Except control and lighting transformers (dry types) all other transformers irrespective of its rating shall be oil filled outdoor types. Employer to confirm that the understanding is correct.	Please refer amendment to Technical Specification (Section VI). Bidders understanding is correct. Bidder's understanding is correct. The Specification for Dry type Transformer is mentioned in Amendment of Technical Specification Section VI Part-B Sub section-II-E12 outdoor Transformers Clause 7.00.00.
824.	Section- IV, Sub section-II-E11	6.02.00		Battery- The minimum voltage at the end of load cycle shall not be less than 1.75 volts per cell.	Bidder understands that battery for DG set shall be Lead acid plante type. Please confirm.	Confirmed
825.	Section- IV, Sub section-II-E11				We presume that DG shall also be solidly earthed, Since 415V AC system is solidly earthed.	DG system shall be kept un-earthed.

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826.	SUB-SECTION-III-B ELECTRICAL SYSTEM/EQUIPMENT	1.10.00		EARTHING AND LIGHTNING PROTECTION Complete below ground earth mat and above ground equipment earthing system and lightning protection for the plant and equipment under contractors scope along with its interconnection to the nearest employers earth grid at two points.	1) We understand that for FGD area separate step & touch potential calculation is not required. Calculation shall be to check ground resistance within limits. 2) Employers to specify the ground resistance limits.(1 ohms or 5 ohms)	1. Bidder shall comply with requirement of technical specifications clause no:- 5.01.00
827.	SUB SECTION-II - E6 CABLING, EARTHING & LIGHTNING PROTECTION	6.00.00		LIGHTNING PROTECTION SYSTEM Lightning protection system shall be in strict accordance with IEC : 62305 and latest IS standards.	Lighting protection calculation shall be as per IEC 62305. Accordingly, FGD system if found protected by near by stack or any other higher structures, air terminations and lightning conductors shall not be provided. Please confirm.	The shall be decided during detailed engg.

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828.	SUB-SECTION-II-E15	6.00.00 (h)		Street lighting primary roads secondary roads	Bidder envisages to provide lighting for auxilliary roads within battery limit of FGD area and shall not provide street lighting of main roads in our scope of work. Kindly confirm	Bidder to provide lighting for roads under his scope
829.	SECTION-VI, PART-B, SUB-SECTION 11-E-16	1.00.00		BATTERY AND DC HEALTH MONITORING SYSTEM:- Note: DC health monitoring system shall be offered integral with each battery set for Main Plant & Switchyard batteries.	We understand that health monitoring system shall not be applicable to FGD system battery. Please confirm	Bidder's understanding is correct.

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830.	SECTION- VI, PART-B, SUB SECTION-II- E6CABLING, EARTHING &LIGHTNING PROTECTION	4.04.13		SeparationAt least 300mm clearance shall be provided between:- HT power & LT power cables, - LT power & LT control/instrumentation cables,	We understand that this clause is applicable for horizontal configuration of cable trays only. Bidder proposes to provide spacing of 100 mm between different tiers of trays for vertical configuration. Please confirm.	When vertical trays are arranged one above the other, 100 mm spacing shall be maintained between bottom of top and top of bottom tray. However 300 mm spacing shall be maintained when vertical trays are arranged side by side
831.	SECTION - VI, PART-B SUB SECTION-11 - E6 CABLING, EARTHING & LIGHTNING PROTECTION	2.01 .08		For feeder in bidder's scope for offsite areas, overhead cable tray arrangement shall be followed.	Bidder understands the purchaser's cable trestle structure between Power House & FGD Area has space and load capability for fixing the bidder's cable tray (if required) for bidder's supplied cables. Bidder will not consider separate cable trestle structure between Power House & FGD Area. Please confirm.	bidder's understanding is NOT correct. Bidder to provide cable tray and its supports for his scope of cable on employer trestle. In case of non availability of space in employers trestle, bidder to make necessary arrangements for cable tray erection and laying. refer clause no:- 1.08.00.2. However bidder may visit the project in order to get itself acquainted with existing electrical of plant

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832.	SECTION - VI, PART-B SUB SECTION-11 - E6 CABLING, EARTH-ING & LIGHTNING PRO-TECTION	2.01.07		Two separate cable routes shall be provided for cable routing of working and standby drives or different set/group (say 50% capacity) of auxiliaries.	Bidder understands that referred clause (i.e. separate route) is applicable for Main incoming cable from Power House Building to FGD area. Within FGD internal area, separate route may not be feasible for redundant equipments.	Bidder shall comply with technical specification requirements.
833.				Tender SLD	Bidder requests employers to furnish co-ordinates/location of 11kV switchgears (customer switchgear) and 3.3kV AHP/CHP swgr in order to enable us to calculate the cable route length.	Refer amended Tender SLD& project GLP.
834.	SECTION- VI, PART-B, SUB SECTION-11-E9 HT SWITCHGEAR	1.00.00		Spare capacity and Future Requirements all MV Switchboards is provided with one spare motor feeder and one transformer feeder on each section for future requirements.	Please note that motor spare feeders may not be applicable in 11kV FGD switchgear, in case there is no motor feeder envisaged to be supplied from this board.	This clause is DELETED. Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI) This clause is deleted. Please refer Amendment to Technical Specification (Section

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
						VI)
835.		Note. 7		Bidder shall provide DC system of adequate capacity for meeting DC loads in FGD area	Bidder proposes to consider 1 set of Battery with charger system for all DC loads requirement for entire FGD area. Please confirm.	Requirement of Technical Specification is clear. Bidder shall provide DC system as shown in Tender SLD with 2 sets of Battery and Battery Chargers.
836.	SECTION-VI, PART-A, SUB-SECTION-IV, TERMINAL POINTS & EXCLUSIONS	1.14.00 c) & d)		c) One (1) no. 240V, single phase, 50 Hz feeder per unit for meeting the unregulated AC power supply requirement for illumination, heating, ventilation, and utility outlets, etc. at bidder's Power supply distribution panel. d) Two (2) 415 V, 3- phase 3 wire, 50 Hz feeder for each set of the bidder's 24 V DC system.	Please provide the coordinates/ location of the board from which One (1) no. 240V supply and Two (2) 415 V supply shall be provided.	Bidder to refer necessary amendment in this regard.

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837.	SECTION- VI, PART-B, SUB SEC- TION-II-E6 CABLING, EARTH- ING & LIGHTNING PRO- TECTION	9.00.00 b)		Separate Switchgear Rooms shall be provided for each unit. For TG building, all HT boards shall be provided in HT switchgear room at only one floor and all L T boards shall be provided in L T switchgear room at only one floor	Bidder understands that this clause is not applicable for FGD Package. Please con- firm.	Bidder understanding is clear.
838.	General	-	-	-	Bidder requests owner to provide soil resistivity report for FGD area for Barh-I, Nabinagar, Darlipalli-I, Gadarwara-I, Lara-I, Kudgi-I, Meja-I, Mouda-II, Solapur-II, Nabinagar-I & Tanda-II projects.	Bidder to refer necessary amendment in this regard.
839.	VI / A / IIIB	1.12.00	4 of 6	To meet the construction power requirement of the FGD and as- sociated systems, the Employer shall provide Two Number 415V feeders in LT switchgears.	Bidder requests owner to mark the exact coordinates for Construction power supply in GLP of respective projects.	This shall be intimated to Bidder during detailed Engi- neering.

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840.	VI / A / IV	2.00.00	3 of 3	EXCLUSIONS	Bidder requests owner to specify exclusions (if any).	Bidder shall comply with Technical Specification requirement.
841.	VI / A / II E-1	2.08.00	5 of 7	An ageing factor of 1.25 shall be considered.	Bidder would like to clarify that for Plante batteries the applicable ageing factor shall be 1.0 as per IEEE 485. Owner may please confirm.	Bidder shall comply with Technical Specification requirement.

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842.	VI / A / II E-2	3.01.00 (b)	2 of 9	Continuous duty LT motors up to 200 KW Output rating (at 50 deg.C ambient temperature), shall be Premium Efficiency class-IE3, conforming to IS 12615, or IEC:60034-30.	Bidder would like to clarify that the starting current for IE3 motors shall be followed as per IS 12615 only. Owner may please confirm.	Bidder shall comply with Technical Specification requirement.
		8.00.00	5 of 9	The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any further tolerance) except for BFP motor. (a) Below 110KW : 11.0 (b) From 110 KW & up to 200 KW : 9.0 (c) Above 200 KW & up to 1000KW : 10.0 (d) From 1001KW & up to 4000KW : 9.0 (e) Above 4000KW : 6 to 6.5		

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843.	VI / A / II E-4	3.01.00 (b)	4 of 6	1.1KV grade PVC power cables shall have aluminium conductor(compact type for sizes above 10 sq.mm), PVC Insulated, PVC inner sheathed (as applicable) armoured/ unarmoured, PVC outer-sheathed conforming to IS:1554 (Part-I).	Bidder proposes Copper conductor for 2.5 & 4 sq.mm cable sizes. Aluminium conductor shall be used for 6 sq.mm & higher sizes. Owner may please accept bidder's consideration.	Bidder shall comply with technical specification requirements
844.	VI / A / II E-6	2.01.04	2 of 69	No sub zero level cable vault/trenches shall be provided below control building/switchgear rooms in main plant.	Bidder understands that cable trenches can be considered in Gypsum / Lime-stone Handling System MCC Room/ FGD switchgear room / Control Room. Owner may please confirm.	Bidder understanding is correct.
845.	VI / A / II E-10	4.22.00	12 of 58	Employer reserves the right to alter the cable entries, if required during detailed engineering, without any additional commercial implication.	Bidder understands that LV switchgear can have top or bottom cable entry. Owner may please confirm.	Confirmed. Please refer clause no. 6.08.00 for clarity.

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846.	VI / EELECTRICAL SINGLE LINE DIAGRAM FOR FGD PACKAGE(Drg no. 0011-109-POE-J-001/A-E rev A)	-	-	-	Bidder requests owner to specify MVA rating for 11/3.45kV EXISTING CHP/AHP Transformers fed from 11kV FGD switch-gear.	Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
847.	VI / E ELECTRICAL SINGLE LINE DIAGRAM FOR FGD PACKAGE (Drg no. 0011-109-POE-J-001/A-E rev A)	-	-	Note 3 - Standard LT Transformers ratings are as follows: 2500/2000/1600/1000/630 kVA	Bidder requests owner to accept LT transformers of rating 1250kVA & 750 kVA in addition to the range mentioned in the referred clause.	Bidder shall comply to Technical Specification.
848.	Section-VI PART-A, Sub-Section-III-C (C&I)	2.01.00	2 of 8	Primary instruments like... vibration transmitter ..	Bidder understands that as specified in Section-VIA Sub-Section-IIIC (C&I), Vibration transmitters shall be considered for vibration monitoring of all critical HT drives in Bidder's scope & same shall be hardwired to FGD PLC system. Accordingly no dedicated Vibration Monitoring System is envisaged for the same.	Bidder's understanding is correct. However, vibration measurement is envisaged for each vibration measurement point as indicated in a)Tender drawing "0011-109-POM-A-001" b) PART A, Clause 23.01.00
849.	Section-VI PART-A, Sub-Section-III-A5, Limestone & Gypsum Handling Plants	2.01.06	3 of 6	Suitable numbers of hammer crusher complete with drives,...., vibration monitoring system etc.		

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850.	Section-VI PART-B, Sub-Section-I-M6, Limestone Handling Plant (LHP)	4.9.3 (vii)	12 of 73	Crusher shall be provided with vibration monitoring (VMS) system . Specification of VMS shall be as specified elsewhere.	Kindly confirm.	of sub section III-A1 c) PART-A, Clause 2.01.06 of sub section III-A5. It is further clarified that as per clause 1.07.00 of sub section III-C2 PART B of technical specification, vibration measuring instrumentation shall be as per the standard and proven practice of the bidder. Vibration measuring instrumentation output (4-20mA) shall be connected to FGD control system instead of vibration monitoring system.
851.	Section-VI PART-A, Sub-Section-III-C (C&I)	9.01.00	8 of 8	Hardwired Signal exchange:... Contractor shall provide Remote Input Output (RIO) for PLC per unit, placed in Central Equipment Room (CER) for the same.	Since common PLC system is considered for FGD of all Units & its associated systems, Bidder understands that PLC RIO panel common for all Units , shall be considered at CER. Kindly confirm.	Bidder's understanding is not correct. Remote Input Output (RIO) panel, located in respective unit (s) CER, for hardwired signal exchange between FGD PLC and BOP DDCMIS of respective unit (s) shall be

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						provided on per unit basis.
852.	Section-VI PART-A, Sub-Section-III-C (C&I)	9.02.00 (2)	8 of 8	Contractor shall provide necessary hardware and software for dual fibre optic connectivity & interconnection with station wide LAN for transfer of signals...	Bidder understands that only supervisory monitoring of FGD system is envisaged through Station LAN connectivity, and type of connectivity/no. of signals to be transferred, shall be considered accordingly. Owner to kindly confirm.	Bidder's understanding is correct that supervisory monitoring of FGD system is envisaged through Station LAN connectivity. However, bidder to further refer clause 9.02.00, PART-A Sub Section-III C, wherein it is mentioned that it is also envisaged to control, operate and monitor FGD and associated system remotely from main plant Central Control Room (CCR). Bidder shall comply with the specification requirement.

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853.	Section-VI PART-B, Sub-Section-III-C4, Instrumentation Cables	8.05.00	10 of 13	The cables emanating from redundant equipment/devices shall be routed through different paths.	Considering the space constraint for FGD system, different path for cables from redundant equipments is not feasible. Owner to kindly consider.	Specification requirements are clear. Bidder shall comply with the specification requirement.
854.	Section-VI PART-B, Sub-Section-III-C5, PLC Based Control System	3.01.01	8 of 27	Input used for interlock/protection shall be dual redundant.	Bidder understands that indicated redundancy refers to redundancy of field instruments, and not the signal (input channel) redundancy. Kindly confirm.	Bidder's understanding is not correct. Bidder to refer clause 3.01.01, PART-B Sub Section-III-C-5, wherein it is mentioned that each of the redundant binary & analog inputs shall be wired to separate input modules. These redundant modules shall be placed in different racks, which will have separately fused power supply distribution. Implementation of multiple measurement scheme of these inputs will be performed in the redundant hardware. Loss of one input module shall not affect the signal to other modules. Other channels of these

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
						modules can be used by other inputs of the same functional group.
855.	Section-VI PART-B, Sub-Section-III-C5, PLC Based Control System	3.01.04	8 of 27	The on-off status of HT drives etc, however, be wired to two input modules in parallel.	Bidder understands that as per referred clause 'on' status of HT drives shall be wired in input module parallel with its 'off' status. Kindly confirm / clarify.	Bidder's understanding is not correct. It is clarified that ON status of HT drive shall be wired to two input modules in parallel. Similarly OFF status of HT drive shall be wired to two input modules in parallel.
856.	Section-VI PART-B, Sub-Section-III-C5, PLC Based Control System	5.03.07	13 of 27	For the drives, the command shall be provided through redundant O/P module to MCC/SWGR/Actuator as applicable...	Output signal redundancy is not specified in the Tender, hence Bidder understands that the same is not applicable. Kindly confirm / clarify.	Bidder's understanding is not correct. It is clarified that output redundancy is applicable for 10% of drives distributed in various functional groups (Exact application shall be finalized during detailed engg.) Please refer amendment in this regard.

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857.	Section VI / Part A / Sub Section III A1	25.00.05	9 of 9	A common nickel based alloy material storage/neutralization tank for both the units of storage capacity of 12 hrs of stack condensate of both the stack shall be provided.	Please confirm the following:1) In case of single flue chimneys, bidder would like to consider separate tanks for each unit, with storage capacity of 6 hrs. of stack condensate for one unit.2) Bidder would also like to explore the option of providing the tank directly below the stack liners on the grade slab.3) Bidder would like to consider CS+2mm wallpaper made of nickel based alloy.	Bidder to refer necessary amendment in this regard.
858.	Section VI / Part A / Sub Section III A1	25.00.05	9 of 9	Alternatively bidder may propose his proven system for the disposal of condensate..	Bidder would like to propose the use of condensate collected from the stack into the water system of the FGD absorber. Kindly confirm.	Bidder shall comply with the specification requirements.
859.	Section VI / Part A / Sub Section III A1	2.06.00	2 of 9	Washed and dewatered gypsum from the dewatering system shall be fed to a belt conveyor (in Employer's scope). The contractor shall discharge the gypsum cake above the Gypsum handling belt conveyor being provided by the Employer.	Bidder understands that gypsum handling system is in bidder's scope. Please confirm.	Bidder's understanding is correct. Bidder to refer necessary amendment in this regard.

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860.	Section VI / Part A / Subsection III A5	3.01 .00	6 of 6	Gypsum shall be conveyed from the vacuum belt filter to the storage shed through a series of double stream conveyors and transfer points/junction towers.		
861.	Section VI / Part A / Sub Section III A1	3.00.00	2 of 9	The contractors scope shall include a common limestone grinding system for all the units and shall comprise of.....	Bidder understands that limestone handling system is in Bidder's scope. Kindly confirm.	Bidder's understanding is correct. Bidder to refer necessary amendment in this regard.
862.	Section VI / Part A / Subsection III A5	2.01.00	2 of 6	Limestone Handling Plant (LHP)		
863.	Section VI / Part A / Sub Section III D CIVIL WORKS	1.06.00	2 of 4	Uniform Finished Ground Level (FGL) in FGD absorber area shall be made available by the owner at a level specified in tender drawing.	Bidder understands that filling / cutting of earth is in his scope in areas other than the main absorber. Kindly confirm.	Refer amendment issued separately.
864.	Section VI / Part A / Sub Section IV Terminal points and Exclusions	1.10.00	2 of 3	Outlet of gypsum storage silo/ shed	As per section VI, Part-A, Sub Section III - A5, Page 2 of 6, "Gypsum to be conveyed to gypsum storage Shed". Bidder shall consider only a storage shed for gypsum. Kindly confirm.	Confirmed.

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865.	Section VI / Part B / Sub Section IV-D Civil Works	3.07.00	8 of 69	Gypsum storage shed The gypsum storage shed shall be RCC framed structure with structural steel work shed with permanent colour coated profile steel sheet roof and side cladding...	Bidder requests for an option for the gypsum storage shed to be made of Structural columns and sheeting. Kindly confirm.	Bidder shall follow technical specifications in this regard. Bidder shall also refer s.no.1 of amendment no 1 in this regard.
866.	Project information			Wind and seismic codes	Kindly confirm the following: 1) Bidder would like to consider IS 875 (Part-3):2015 for wind loading 2) Bidder would like to consider IS 1893 (Part 2):2016, "General provisions and buildings" for buildings and IS 1893 (Part-4) : 2015 "Industrial structures including stack - like structures" for stacks along with site specific spectra provided.	Bidder shall comply to site specific "criteria for wind and earthquake resistant design of structures" specified in "Project information" section of technical specification.
867.	Section VI / Part A / Sub Section II-A6 Project information, Solapur (2X660MW)	7.08.00	19 of 31	Employer has carried out geotechnical investigation in vicinity to the proposed area. Logs of representative boreholes for bidder's information in the vicinity of proposed area are enclosed with	Kindly furnish the annexure mentioned in the clause referred in the specification.	Bidder to refer amendment

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				this annexure.		
868.	Section VI / Part A / Sub Section II-A10 Project information, BARH STPP STAGE-1 (3X660MW)	2.00.00	30 of 30	List of drawings placed below in this subsection...	The topographical survey drawing no: 9562-999-POC-F-002 is unavailable. Kindly provide the same.	Refer amendment issued Separately.
869.	Section VI / Part A / Sub Section II-A4 Project information, Darlipalli (2X660MW)	7.00.00	10 of 30	Geotechnical data and foundation system for the respective project are enclosed at annexure III. The corresponding borelogs are enclosed at annexure IV.	Kindly furnish the annexure IV mentioned in the clause referred in the specification.	Bidder to refer amendment

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870.	TANDA-II-A7-2 Annexure-IV tanda-II			Bore log data	The co-ordinates of Bore-log provided in the bore logs do not go in conjunction with coordinates in the provided plot plan. Kindly furnish the revised bore-log coordinates in-line with provided plot plan and topo survey.	Bidder may refer Clause No.7.00.02, as mentioned in Clause No. 7.00.02, the available borelog data is of vicinity to proposed structure and the same has already been furnished in the tender document. Detailed Geotechnical Investigation shall be carried out by contractor.
871.	Section VI / Part A / Sub Section II A2	5.00.00	4 of 48	Damping in Structures (c) Reinforced Concrete Stacks : 3%	Bidder requests for horizontal seismic acceleration spectral coefficients for damping factor equals to 3% (as a percentage of critical damping).	The same is provided at "criteria for earthquake resistant design of structures" specified in "Project information" section of technical specification except for Lara Project. It will be furnished in the amendment to technical specification for Lara Project.

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872.	Section VI, Part B, Subsection IV-D - Civil works	39.03.00	66 of 69	Fly ash based Portland poz-zolona cement conforming to IS:1489, Part I shall preferably be used.	a) OPC cement mixed with fly ash can also be used for FGD structures except for Chimney. Owner to please confirm. b) Clause 39.03.00 is not applicable for Chimney shell. For Chimney shell, bidder have to use OPC cement only. Please confirm bidder's understanding.	a. Bidder shall comply with Technical specification requirement. b. For chimney shell, only OPC cement shall be used.
873.	General				Only two borelogs are furnished in the tender document for Barh project. Bidder request Owner to furnish additional bore holes as the FGD structures are located in a scattered manner within the existing units.	Bidder may refer Clause No.7.00.02, as mentioned in Clause No. 7.00.02, the available borelog data is of vicinity to proposed structure and the same has already been furnished in the tender document. Detailed Geotechnical Investigation shall be carried out by contractor.

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874.	Section VI, Part A, Subsection IIID, Page 1 of 4	1.04.00	1 of 4	If at any stage of work, any dismantling or modification or relocation of any existing facility is required to be done to complete the work in bidder's scope.....the same shall be done by bidder with no extra cost or time implication to the Employer	Dismantling, rerouting & restoration of existing structures which may foul with proposed FGD facilities need to be identified by Owner before hand. Hence Owner is requested to furnish the below mentioned details which are of utmost importance:a)Project wise list of existing structures/ facilities which can be rerouted to accommodate proposed FGD facilities.b) Facility wise schedule of shutdown window which will be available to FGD EPC contractor for interface activities as well as dismantling and rerouting.c)Owner shall be responsible for taking timely Shutdown of existing operational facilities, if required, in order to facilitate FGD construction work. Please confirm.	Relocation of existing facilities will however depend on the bidder's proposal. Any hindrance and evident underground facilities shall be suitably re-located by the bidder. If during the execution of the works it is found that the facilities in the Contractor's scope are fouling with any existing abandoned foundations and underground trenches including pipe and cable trenches for which the contractor is not provided any drawings by NTPC neither the Contractor was appraised beforehand, the

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						same shall be dismantled & relocated by station. However, Bidder shall note that any re-routing and modification work that will be suggested by the Bidder in such an eventuality shall be subject to the Employer's approval and, if required, Bidder shall modify his design to suite the actual site conditions.

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875.	Section VI, Part A, Subsection IIID, Page 1 of 4	2.00.00	2 of 4	Bidder shall provide permanent access to all facilities/structures from the near-by existing roads of the Owner. Roads shall be in concrete (M 35) as per IRC....Width of all such roads shall be 7.5 M concrete pavement.	Bidder requests NTPC to provide width requirement for shoulders? Also whether shoulders are required on both sides of road?	Refer amendment issued separately.
	Section VI, Part B, SubSection IV-D	12.00.00	30 of 69	The road construction including its shoulders, base, sub base and concrete pavement shall be as per IRC standard.		
876.	Section VI, Part A, IIA-10	7.03.00, d)	12 of 30	Pile diameter - 600 mm	NTPC Barh - Being an EPC bid, Owner to allow bidder to select pile diameter, length and capacities as per detailed soil investigation and test pile result.	Bidder shall comply the provisions of technical specification.

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877.	Section VI, Part A, IIA-10	7.03.00, b)	10 of 30	The maximum allowable bearing pressure shall be as per the approved geotechnical report and shall be limited to values as furnished in Table-2	NTPC- Barh Bearing pressure values furnished in table-2 are limited to a depth upto 2.5 m below NGL. Bidder understands that for a greater depth greater than 2.5 m, higher bearing pressure, if applicable as per approved soil investigation report shall be permitted. Please confirm bidder's understanding.	Bidder may refer amendment.
878.	General				Owner to furnish AutoCAD Copy of contour survey drawings for all projects.	Owner provides only PDF files

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879.	Section VI, Part B, Subsection IV-D - Civil worksSection VI, Part A, Subsection II - A11Section VI, Part A, Subsection II - 8A	39.03.003 9.04.007.0 8.00 g)Annexure-III (New Nabina-gar-I)	66 of 6966 of 6922 of 2921 of 31	Fly ash based Portland poz-zolona cement conforming to IS:1489, Part I shall preferably be used....or Fe500D, and conforming to other requirements of IS:1786Chemicals in ground water as observed during investigation are:.....Cement type - As specified elsewhere in the specification.g)Special requirements:Chemicals in ground water as observed during investigation are:.....In view of the above, the following shall be adopted for all foundations and substructures,	BRBCL and Nabinagar - No separate specification for cement type and reinforcement steel are mentioned in the relevant subsection. Hence bidder shall follow clause no. 39.03.00 for Cement and clause no.39.04.00 (Subsection IV-D, Section VI, Part B) for Reinforcement steel for projects, wherever special requirements are not mentioned. Please confirm bidder's understanding.	Bidders's understanding is correct.
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880.	Section VI, Part B, Sub Section - I - M1 Section VI, Part B, Subsection-IV-D - Civil works	3.00.00 3.14.04	5 of 51 13 of 69	The entire flue gas system, flue gas ducts, absorber etc. shall be designed to meet the following conditions: Criteria of flue gas exit velocity for sizing the flue liner material shall be specified elsewhere in the specification.	Owner to specify the below mentioned details for design of 150 m high Chimney: a) Maximum Flue gas exit velocity b) Pressure at Chimney Inlet to be considered by bidder for design. The above mentioned details have not been furnished in tender specification.	a) Specification requirement is clear under the referred cl.no. . Bidder shall comply with the specification requirements. b) To be optimized by the bidder based on its system design and selection.
881.	Errata 1 to Section VI, Part A, Subsection II - A8	Annexure B	9 of 31	a) The basic wind speed "Vb" at ten	NTPC 3x660MWNabinagar - The basic wind speed Vb at ten meters above the mean ground level may please be specified.	The basic wind speed "Vb" at 10m height above the mean ground level for "NABINAGAR-I 3X660 MW" project shall be 47 metres/second. Also refer Amendment issued separately in this regard.

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882.	Section VI, Part A, Subsection IIA6-4		Equipment layout plan at El 0.00 m	NTPC Solapur - All elevations indicated in the drawing are wrt TG building ground floor elevation as (+/-)0.00 which corresponds to RL(+) 416.5	NTPC Solapur - Bidder understands that FGL for the plant is RL 461 m whereas TG ground floor level i.e. FFL is RL 461.50. Please confirm.	Bidder's understanding is correct.
883.	Section VI, Part A, Subsection IIA6-4	7.00.01	9 of 31	The corresponding bore logs are enclosed at annexure-IV.	NTPC Solapur - Owner to furnish soil investigation report for the vicinity area as the same are not available with tender document.	Bidder to refer amendment.
884.	Section VI, Part B, Sub Section - IV-D	12.00.00	31 of 69	Concrete pavement of the road shall be done with fully mechanized paver fitted with electronic sensors for construction technique.	As quantum of road work is very less and considering lack of space within the existing units, bidder understands that deployment of mechanical pavers are not mandatory. Owner to kindly confirm bidder's understanding.	Method(s) as per IRC may be followed.
885.	Section VI, Part B, Sub Section IV D, Civil works	10.00.00	26 of 69	Site LevellingSite levelling of gypsum area, lime storage area, gypsum dewatering area, truck hopper and associated areas to be levelled in one block.	Bidder is free to decide FGL based on existing NGL in order to optimize cutting and filling quantities. Owner to please confirm.	Site levelling shall be done by Owner as per the levels specified in GLP in tender document. Only site clearance and minor grading is in bidder's

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
						scope.
886.	Section VI, Part A, Subsection II-A4	Annexure III	19 of 30	Employer has carried out geotechnical investigation in vicinity to the proposed area. Logs of representative boreholes for bidder's information in the vicinity of proposed area are enclosed with this Annexure	Geotechnical investigation for Dalipalli Stage-I, 2x800 MW project is not attached along with the tender document. Owner is requested to furnish the same.	Refer amendment issued separately
887.	Section VI, Part B, Sub Section - IV-D	19.00.00	39 of 69	All steel structures shall be fabricated in factory, transported and erected at site.	Bidder understands that fabrication of silo/hoppers /tanks /absorber shell,etc. can either be fabricated at factory or fabricated at site. In case of site or shop fabrication, field connection will be welded. Please confirm bidder's understanding.	Considering the large dimensions of the said equipment, Bidder's understanding is correct.

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888.	Section VI, Sub-section - IIA-3	Lara topographic survey		Topographical survey, Drg No. 9548-999-POC-F-002, Rev 0	NTPC Lara Super Thermal Power Project - Finished ground level for the plant are @ RL 203 M and RL 202 M whereas the natural ground levels (reduced levels) as per the topographical survey drawing are in the range of 224-230 M. Owner to please verify whether bidder have received the correct topographical survey drawing for the referred project.	Refer amendment issued separately.

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889.	Section VI, Part B, Sub Section - I-M6	3.4.0	3 of 73	Crushed limestone shall be stored in covered ground storage sheds using mobile trippers . The capacity of the storage shed shall be equivalent to limestone consumption for atleast 7 days..... From reclaim hopper , crushed limestone of (-) 20 mm size would be fed to limestone bunkers through...	In order to keep all bidders at par, Owner to please clarify the following: a) In case crushed limestone to be stacked under a storage shed with hopper, owner to specify the ratio of underground to overground hopper. b) Owner is also requested to share schematic drawing of the limestone storage shed.	One third (1/3 rd) of total stipulated crushed limestone storage shall be considered in the hopper and hopper length shall be equal to stockpile length placed along the tripper centreline. Bidder to refer Amendment in this regard.
	Section VI, Part A, Sub Section III-A5	2.01.07	3 of 6	Crushed limestone Reclaim hopper(RH)/Silo, machinery hatches at each end of limestone storage shed for RH, fully/partially underground or overground junction towers.....		

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
890.	Section VI, Part A, Sub Section III-A5	2.01.01	2 of 6	Before existing crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house through series of new conveyors/bucket elevators. All necessary modifications involving Mechanical, Electrical, Civil and Structural works in the existing CHP for taking feed to new limestone path shall be in the scope of the bidder.	Owner is requested to share the following drawings pertaining to Crusher house for all projects: a) GA and elevation drawings of crusher house indicating floor wise equipment layout. b) Foundation drawings for crusher house c) Conveyor profile and layout drawings of CHP d) Structural steel drawings of Crusher house e) Design document of Crusher house building	General Layout Plan of the plants is already given in the tender documents. Other drawings like Coal Flow Diagram and Transfer Tower GA, if required, shall be provided to successful bidders.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
891.	Section VI, Part A, SUB SECTION-III-A1, FGDSUB-SECTION-IVTERMINAL POINTS & EXCLUSIONS	2.06.001.1.1 0.00	2 of 92 of 3	Washed and dewatered gypsum from the dewatering system shall be fed to a belt conveyor (in Employers scope). The contractor shall discharge the gypsum cake above the Gypsum handling belt conveyor or being provided by the Employer. TERMINAL POINTS:Gypsum Outlet of Gypsum storage silo/shed	There is discrepancy in the referred clauses for the scope of Gypsum handling belt conveyor. Bidder understands that gypsum handling belt conveyor including gypsum storage silos are in bidder's scope in line with referred terminal points. Please confirm bidder's understanding.	Bidders understanding is correct. Refer necessary amendment in this regard.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
892.	Section VI, Part A, SUB-SECTION-III-A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.01	2 of 6	Two (2) numbers Box Feeders/ Bulk-material Receiving Unit/ Underground Truck Unloading Hopper / Surface feeder, for unloading of limestone from trucks/ self tipping trucks/ loader shovels, complete with drives, accessories all mechanical, electrical and C&I, Civil & structural works, including its supporting foundations etc. This unit shall feed limestone onto the conveyor before Limestone crusher house.	Bidder requests Owner to confirm the storage volume as required for hopper at the inlet of surface feeder.	The system shall be designed to handle trucks of 60 MT gross weight. Necessary amendment in this regard shall be issued.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
893.	Section VI, Part A,SUB-SECTION- III-A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.01	2 of 6	Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house through series of new conveyors/bucket elevators. All necessary modifications involving Mechanical, Electrical, C&I, Civil and Structural works in the existing CHP for taking feed to new limestone path shall be in the scope of the bidder. For unloading of Limestone through WT/Track Hopper of the existing Coal Handling Plant, limestone 'Feed Point' before existing CHP's Crusher House.	Owner is requested to furnish the following to enable bidder to design the limestone handling layout: 1) GA and elevation drawing of existing coal conveyor before existing coal crusher house 2) GA and elevation drawing of existing CHP crusher house. 3) GA and elevation drawing of existing Transfer points just before coal crusher house.	General Layout Plan of the plants is already given in the tender documents. Other drawings like Coal Flow Diagram and Transfer Tower GA, if required, shall be provided to successful bidders.
894.	Section VI, Part A,SUB-SECTION- III-A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.06	3 of 6	Suitable numbers of hammer crusher complete with drives, accessories all mechanical, electrical civil & structural works, including crusher supporting foundations, vibration isolation system with springs and viscous dampers, vibration monitoring system etc.	Owner is requested to allow for impact/roll type crusher also as an alternative to hammer mill as there are limited manufactures for such higher capacity (1200 TPH) hammer mill.	Technical Specification is clear. Bidder shall comply.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
895.	Section VI, Part A, SUB-SECTION- III- A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.07	3 of 6	Crushed limestone Reclaim Hopper (RH) / Silo, machinery hatches at each of end of limestone storage shed for RH, fully / partially underground or over ground junction towers, tunnels and pent houses, complete with civil, structural, architectural, electrical and C&I works including over ground structural shed for entire length of limestone ground storage and machinery hatches, removable chequered plate covers over openings in machinery hatches for handling underground equipment like paddle feeders etc. (as applicable). For Limestone storage shed and for all buildings, other equipment such as DS system, ventilation system, drinking water system, drainage system etc. as specified elsewhere in the specification.	We understand DS system is not applicable for limestone, kindly clarify.	DS system is not applicable for limestone handling. Necessary amendment shall be issued.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
896.	Section VI, Part A, SUB-SECTION- III- A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.27	5 of 6	One (1) number of belt vulcanizing machine, suitable for all belt widths in limestone handling system, complete with all mechanical, electrical, accessories and consumables for one year of consumption. Further belt jointing facilities as specified shall be provided.	We are considering common belt vulcanizing machine for Limestone and Gypsum handling plant. Kindly confirm.	Confirmed.
897.	SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.11.3	16 of 73	" vii. Feeder carriage drive shall be suitably designed so that the forward & reverse movement of carriage can be achieved without stopping the scooping operation. Tank filled with water in DS system shall also be considered for travel drive. Capacity of tank mounted on tail end side shall be sufficient for half an hour operation....."	As this section deals with Limestone handling, so the DS System is not applicable as Dust extraction system is envisaged for Limestone paddle feeders. Pl. clarify & confirm.	Confirmed.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
898.	Section VI, Part A, SUB-SECTION- III- A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.23	5 of 6	Complete dust extraction system for control of fugitive dust in limestone storage shed / Silos, junction towers, crusher house complete with fans, drives, hoisting arrangements, ducting, piping, valves etc. electrical, accessories, civil, structural and architectural works.	Bidder understand that DE system below existing CHP track hopper and wagon tipplers is not envisaged for handling limestone dust. Please confirm bidder's understanding.	Confirmed.
899.	Section VI, Part A, SUB-SECTION- III- A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.19	4 of 6	One (1) number of passenger cum goods elevator with drives, all electrical, mechanical, civil, structural & associated foundation works, accessories and electrical to serve various floors of lime stone crusher house.	Bidder requests Owner to confirm the capacity of elevator for limestone crusher house.	One (1) number conventional enclosure type passenger cum goods elevator having capacity of 16 persons (1088 kg) complying to IS:14665 (latest edition) with drives, all electrical, mechanical, civil, structural & associated foundation works, accessories and electrical to serve various floors of lime stone crusher house. Staircase access for machine room shall also be provided by the bidder.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
900.	Section VI, Part A,SUB-SECTION- III- A5 LIMESTONE & GYPSUM HANDLING PLANTS	2.01.28	5 of 6	Minimum one (1) no. Weighing Bridge for Road trucks / Tipplers shall be provided each in Lime-stone unloading area and in Gypsum Loading area.	Bidder requests Owner to confirm the capacity of weigh bridge for limestone unloading and gypsum loading area.	Weigh bridge capacity shall be 100 MT.
901.	Section VI, Part A,SUB-SECTION- III- A5LIMESTONE &GYPSUM HANDLINGPLANTS	3.07.00	6 of 6	Gypsum from storage shed shall be loaded to user's trucks using front end loader/ pay loader.	Whether front end loader/ pay loaders needs to be supplied by bidder or it shall be by NTPC.If yes, then Qty and capacity of front end loader/ payloaders required for gypsum & limestone to be specified.	Technical Specifications is clear. Front end loader/ pay loaders are not in bidder's scope.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
902.	Section VI, Part A, SUB SECTION: III-A4 EQUIPMENT COOLING WATER SYSTEM	1.01.00	3 of 3	EQUIPMENT COOLING WATER SYSTEM (FOR LARA STPP- 2 X 800 MW, KUDGI-2 X 800 MW, GADARWARA -2 X 800 MW, DARLIPALI-2 X 800 MW, MOUDA –II 2 X 660 MW, TANDA-II -2 X 660 MW, MEJA-2 X 660 MW,) 3 x 50% (2 working + 1 standby) capacity of plate type heat exchangers.	In case of kudgi project, the plant configuration is 3 x 800 MW. While the configuration stated in referred clause is 2 x 800 MW. Also accordingly the PHE configuration specified for kudgi project is 3 x 50%. Bidder requests NTPC to kindly clarify PHE configuration for 3x800 MW Kudgi project.	Necessary amendment is being issued.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
903.	Section VI, Part A, SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	10.08.00	22 of 26	Continuous Motor Rating: a) For conveyors of belt conveyor systems *120% of actual power at drive motor output shaft at specified design capacity.	Bidder proposes to consider the Continuous Motor Rating: as follows: a) For conveyors of belt conveyor systems *120 110 % of actual power at drive motor output shaft at specified design capacity in line with NTPC Patratu Project. Please confirm your acceptance.	Noted. Bidder may please refer the amendment in this regard.
	SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.1.6	5 of 73	Rating of all drive motors of conveyors shall not be less than 120% of the power required at drive motor output shaft at specified design capacity.		

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
904.	Section VI, Part A, SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	10.15.00	25 of 26	Dust extraction system: Type : Venturi scrubber type Location : Belt feeder after crusher & Vibrating Screening Feeder at crusher house.	Due to discrepancy in referred clauses, bidder shall consider the DE system for Limestone as per cl. No. 4.13.18 of Sub Sec-I-M6 of part-B and not as per cl no 10.15.00 of Sub Sec-V of part A.	Noted.
	Section VI, Part B, SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.13.18	20 of 73	Dust extraction system for Limestone Handling area: Dust extraction system for limestone handling system shall be dry type comprising of dust collection hoods, ducting, fans, bag filter and dust collection hopper.	Please confirm.	

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
905.	SUB-SECTION- III- A5LIMESTONE & GYPSUM HANDLING PLANTSSUB-SECTION-I-M6LIMESTONE HANDLING PLANT(LHP)	2.01.053.3.0	3 of 63 of 73	Suitable numbers of <u>vibrating feeders</u> in limestone crusher house to feed thelimestone to crushers with drives, dust hoods, all mechanical, electrical accessories and supporting structures etc.In limestone crusher house, limestone from each incoming Conveyor shall pass through two (2) numbers of (dedicated) <u>Vibrating grizzly/ screening Feeders</u> and two (2) numbers of (dedicated) crushers respectively which shall crush limestone to (-) 20mm size or to suit limestone pulverizer and system.	Due to discrepancy in referred clauses, please confirm whether vibrating feeders or vibrating grizzly/screen feeders to be considered for limestone feeding to Crusher.	Vibrating screening feeder shall be considered for limestone crusher house. Necessary amendment shall be issued.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
906.	SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.10.0	14 of 73	Vibrating feeder shall be provided below the crusher for limestone.	Due to discrepancy in referred clauses, please confirm the position of vibrating feeder in limestone crusher house.	Clause No.2.01.05 of Sub-section III-A5 shall be followed in this regard. Necessary amendment shall be issued.
	SUB-SECTION- III-A5 LIMESTONE & GYP-SUM HANDLING PLANTS	2.01.05	3 of 6	Suitable numbers of vibrating feeders in limestone crusher house to feed the limestone to crushers with drives, dust hoods, all mechanical, electrical accessories and supporting structures etc.		
907.	SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.5.3	9 of 73	Alternatively, Air cooled type scoop coupling is also acceptable for all conveyors with HT motors for (AHP, LHP, GHP) and crusher scoop couplings.	Bidder understands that AHP conveyor is not applicable for these FGD tenders. Please confirm bidder's understanding.	Confirmed.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
908.	SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.7.0	10 of 73	<u>TRAVELLING TRIPPER AND BUNKER SEALING ARRANGEMENT:</u> Mobile Trippers on bunker conveyors along with belt sealing arrangement shall be furnished and erected. <u>PLOUGH SYSTEM</u> (IF APPLICABLE): As an alternate to travelling tripper (Alternate option applicators) plough type system may be provided by the bidder.	Due to discrepancy in referred clauses, bidder understands that any of the following system can be considered on limestone bunker conveyor. 1) Travelling tripper 2) Plough System 3) Fixed Trippers Please confirm bidder's understanding.	Confirmed.
	SUB-SECTION- III- A5 LIMESTONE & GYP- SUM HANDLING PLANTS	4.8.0 2.01.14	11 of 73 4 of 6	<u>Suitable number of ploughs</u> and its actuating mechanism shall be mounted on each conveyor to feed limestone into limestone mill bunkers. Alternatively, suitable nos. <u>fixed Trippers</u> on each conveyor to feed limestone into limestone mill bunkers.		

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
909.	Section-VI / Part-A / Sub-Section-I	4.04.024.04. .02.01,4.04. 02.02	15 of 19	Route-2: The Bidder/its Sub-vendor who do not meet the qualification requirements stipulated at 4.04.01.01 above, may also participate provided the Bidder/its Sub vendor is a contractor who have designed, supplied, erected/supervised erection and commissioned/supervised commissioning at least one (1) number of Waste Water Treatment System (essentially comprising of Evaporator (Brine Concentrator) operating in and/or Crystalliser) operating in an Industrial unit which should have been in successful operation for a period not less than one (1) year reckoned as on the date of consideration for approval but not later than six months after award date of contract to the Main bidder and <u>associates/collaborates with an Associate/ Collaborator who in turn fully meets the requirements stipulated at 4.04.01.01</u> above: Bidder/its sub vendor should also have a valid ongoing collaboration and technology transfer agreement with an Associate/Collaborator meeting re-	Bidder request owner to modified the proveness criteria for FGD waste as follows: The Bidder/its Sub-vendor who do not meet the qualification requirements stipulated at 4.04.01.01 above, may also participate provided the Bidder/its Sub vendor is a contractor who have designed, supplied, erected/ supervised erection and commissioned/ supervised commissioning at least one (1) number of Waste Water Treatment System (essentially comprising of Evaporator (Brine Concentrator) and/or Crystalliser) operating in an Industrial unit which should have been in successful operation for a period not less than one (1) year reckoned as on the date of consideration for approval but not later than six months after award date of contract to the Main bidder and associates/collaborates with an Associate/ Collaborator who in turn fully meets the requirements stipulated at 4.04.01.01 above. The above changes in proveness criteria is required to avoid monopoly of some vendors who qualify as per Route-1, cl 4.04.01.01.	Bidder to refer clarifications being issued separately.
BIDDING DOCUMENT NO.: CS-0011-109(1A)-2				Doc No: CS-0011-109(1A)-2-CLRF-TECH-01		Page 417 of 736

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
910.	Section-VI / Part-A / Sub-Section-IV	General	-	TERMINAL POINTS & EXCLUSIONS	Owner to specify the water availability (pressure & terminal point) for HVAC for FGD related scope of work.	
911.	SECTION – VI, PART-A / SUB-SECTION-IV Terminal Points & Exclusions	1.08.00	2 of 3	FGD waste water pipes shall terminate along with isolation valve at 5 meters near HCSD mixing tank	We presume this is not applicable in Barh & Nabinagar, since ZLD is provided. Please clarify.	Bidder's understanding is in order.
912.	Process Flow Diagram / ZLD		3 of 3		The scheme shows steam driven crystallizer, whereas write up calls for MVR. Please clarify.	As mentioned in Cl. No. 2.00.00 D, Sub-section I-M7, Part-B, Auxiliary steam if required shall be provided by owner for start-up condition only. For continuous duty, Bidder to design the various systems considering power driven equipment and the same shall be considered in power guarantee.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
913.	Section VI, Part B, Sub Section IV D, Civil works	17.21.00 b)	37 of 69	Waterproofing treatment shall be provided for liquid retaining/carrying structures and basement type structures (requiring dry working condition). Truck hopper - Chemical injection grouting for inner faces. Polymer modified cementitious coating on earth side face as per the following:	Bidder understands that clause no. 17.21.00 of subsection IV-D Civil works, is not applicable for truck hopper and limestone hopper. Please confirm.	Bidder's understanding is correct.
914.	Section VI, Part B, Sub Section IV D, Civil works	3.01.00	3 of 69	The FGD system shall have an independent absorber for each unit, common limestone milling systems and common gypsum dewatering system for each Lot 1 A Project.	The space available for installation of FGDs at most sites is very limited. In such cases, it shall be beneficial to optimise the available space when offered technology is capable to do so with equal effectiveness. Bidder offers Jet Bubbling Technology, which has excellent flexible operability even at shutdown ratios of 15%. We request NTPC to accept option of offering combined absorber for multiple units. Our collaborator has proven references of such common absorbers installed for multiple units operating successfully globally.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
916.	SECTION-VI, PART-B/ SUB SECTION-1-M3/COMPRESSED AIR SYSTEM	2.02.02	1 of 7	The rotor and shaft shall be of single piece construction, made of forged steel (AISI C1141 or equivalent). The stator (casing) shall be of Cast-Iron (IS-210 grade) Construction with integral jacket cooling. The rotors shall be dynamically balanced to reduce vibration.	Bidder would like to clarify that, material of construction of compressors shall be as per manufacturer' s standard design which is proven in the industry. Owner is requested to accept the same.	Bidder shall comply with specification requirement. However, any superior material may be accepted as per manufacturer proven design practice
917.	SECTION-VI, PART-B/ SUB SECTION-1-M3/COMPRESSED AIR SYSTEM	4.11.00	2 of 7	For the instrument air compressors offered with "Heat of compression" type air drying plants, the after coolers shall be provided at downstream of Air Drying Plant.	Bidder would like to clarify that, after cooler shall be integral part of compressor instead of installing the seperate aftercooler downstream of air dryer and the hot air required for HOC type dryer regeneration shall be taken from last stage of compressor, before after cooler as per prevailing industry practice. Owner is requested to accept the same.	Bidders query is not clear. In HOC type Air dryer, to reduce the discharge temperature at dryer outlet to 45 deg celcius, after cooler shall be provided at downstream of air dryer as per specification requirement.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
918.	SECTION-VI, PART-B/ SUB SECTION-1-M3/ COMPRESSED AIR SYSTEM	3.04.00	2 of 7	Compressor frame shall have minimum 10% extra capacity. Compressor shall have 25% minimum turndown capability (at 45 deg C & 75% RH). Compressor shall be provided with IGV at the suction flange.	Bidder requests owner to relook the additional margin of 10% on compressor capacity in frame size as specified, since the margin of 100% on actual air requirement is already considered in sizing criteria{i.e. 2(A+B+C+D)} } Owner is requested to accept the com-	The referred cl. 3.04.00 stands deleted. Bidder to refer relevant amendment.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
919.	SECTION- VI, PART-A / B-SECTION-VSALAIE NT DESIGNDATA & SIZING	9.01 .00, a)	20 of 26	Air Compressor Air Compressor shall be designed to meet the Instrument air and service air requirement of all the equipments/plant/systems to be supplied by the Contractor for FGD Plant and ZLD plant (if applicable) as follows:-Sl. No. Continuous Requirement Quantity (in NM³tmin)1. Instrument air requirement for FGD plant A(Continuous)2. Instrument air requirement for ZLD plant B(Continuous)3. Service air requirement for FGD plant C4. Service air requirement for ZLD plant D5. Total Air requirement = A+B+C+D6. Capacity of air compressor = 2(A+B+C+D)	presor without additional margin of 10% on capacity.	The referred cl. 3.04.00 stands deleted. Bidder to refer relevent amendment.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
920.	SECTION-VI, PART-B/ SUB SECTION-1-M3/COMPRESSED AIR SYSTEM	3.01.00	2 of 7	Air Compressors (screw / Centrifugal type) shall be designed for continuous operation with high efficiency to satisfy the performance requirement as specified in the Data Specification Sheet.	The air requirement for FGD plant is very less (minimum capacity specified is 15 Nm³/min), hence bidder suggests to provide screw type or reciprocating type compressors instead of centrifugal compressors. Please note that centrifugal air compressors are not recommended for lower capacities. Owner is requested to confirm.	Type of compressor shall be screw type as specified in Section VI, Part A sub section -III-A2. Bidder to refer relevant amendment.
921.	SECTION-VI, PART-A/SUB SECTION-II-A10/PROJECT INFORMATION/BARH STPP STAGE-I(3X660 MW)	-	21 OF 30	CLIMATOLOGICAL TABLE-BARH STPP STAGE-I(3X660 MW)	Owner is requested to furnish the readable version of climatological table, since the text is not clear in table attached with project information.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
922.	SECTION- VI, PART-A/ SUB SECTION-III-A2/ AIR CONDITIONING, VENTILATION SYSTEM & COMPRESSED AIR SYSTEM	1.00.00 (b)	1 of 4	Air Conditioning system for FGD Control room building and ZLD control room building 9if provided) Air Cooled condensing units (DX type) type air conditioners with AHU of suitable capacity with 100% redundancy (as per actual heat load calculation) shall be provided.	For ZLD control room (if required) if total ac load is of order of 15-25 TR, ductable split / packaged ac shallbe provided as mentioned in silent design data & sizing. Owner to confirm.	noted

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
923.	SECTION- VI, PART-A/ SUB SECTION- V/Salaient design data & sizing	7.01.00 (15)	11 of 26	For areas, where a/c load is of the order of 25-60 TR, Direct expansion (D-X) type condensing unit (with AHU) shall be provided depending on the availability of space / layout etc. For areas, where A/C load is of the order of 15-25 TR, ductable split/package A/C shall be provided. Smaller areas which are away from the D-X type condensing unit / central chilling units which may require air conditioning upto 15 TR shall be served with Hi-Wall Split / cassette air conditioner units as per requirement.		noted

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
924.	SECTION- VI, PART-A/ SUB SECTION-III-A2/AIR CONDITIONING, VENTILATION SYSTEM & COMPRESSED AIR SYSTEM	2.00.00 (b)	2 of 4	Non A/C areas of FGD Control room building and ZLD control room building 9if provided) Minimum One (1) no of evaporative type unitary air filtration (UAF) unit (of metallic construction modular type) of suitable capacity with all accessories, DIDW centrifugal fan 91X100%), circulating water pump (1X100%) etc as detailed out in technical specification shall be provided.	Since ZLD Control rbuilding (non a/c area) less in capacity and heat load, bidder proposed dry ventilation system ZLD control building. Owern to confirm compliance.	Bidder shall comply with specification requirement. However If ZLD building is separate building , mechanical ventilation shall be provided. Bidder to refer relevant amendment also in this regard.
925.	SECTION- VI, PART-B/ SUB SECTION-I-M2/AIR CONDITIONING, VENTILATION SYSTEM	3.01.00 (i)	1 of 26	Unitary air filtration (UAF) units of min. capacity 75000 m3/hr or capacity calculated considering 8 air changes per hour whichever is higher, shall be provided for Non-Air conditioned areas of FGD and ZLD (as provided) control building (e.g. switch gear rooms, cable galleries etc.)	Since, Non air conditioned areas of ZLD is smaller in volume and Heat load, Bidder will provided UAF unit as per capacity calculation according to Design criteria mentioned in technical specification. Owner to confirm compliance.	Bidder to refer relevant amendment in this regard.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
926.	SECTION- VI, PART-B/ SUB SECTION-I-I-M2/AIR CONDITIONING, VENTILATION SYSTEM	3.01.00 (ii)	1 of 26	Mechanical Ventilation (using roof extractors / supply and /or exhaust fans) shall be provided for various other areas / buildings in the scope of bidder as under. A) Grinding System Building B) Gypsum Dewatering building c) Recirculation pump & Oxidation blower / compressor building.	As per clause no. 3.02.00, Bidder understand that Exhaust air fan and fresh air louvers for following areas / building shall be provided. A) Grinding System Building B) Gypsum Dewatering building C) Recirculation pump & Oxidation blower / compressor building. Owner to confirm bidder understanding.	Specification requirement is amply clear. Accordingly, Mechanical Ventilation (using roof extractors / supply and /or exhaust fans) shall be provided for following building: A) Grinding System Building B) Gypsum Dewatering building c) Recirculation pump & Oxidation blower / compressor building.
927.	SECTION- VI, PART-B/ SUB SECTION-I-I-M2/AIR CONDITIONING, VENTILATION SYSTEM	3.02.00	1 of 26	All non air conditioned areas covered under this package shall be ventilated by a combination of supply / exhaust fans and fresh air intake / back draft louvers as detailed below.		
928.	SECTION- VI, PART-A/ SUB SECTION-III-A2/ FIRE DETECTION & PROTECTION SYSTEM	1.00.00 (1.2 & 1.3)	1 of 2	HVW Spray System & MVW Spray System	Owner is requested to provide Spray pump capacity (flow) for HVWS and MVWS system.	Capacity of spray pump (existing) is 410 cmh and head 105/120 MWC.

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Sr. No	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC's Clarification
929.	SECTION- VI, PART- ASUB SECTION-III- A1FGD	1.03.00	1 of 9	The FGD system shall have an independent absorber for each unit, common limestone milling systems and common gypsum dewatering system for each Lot 1 A Project.	The space available for installation of FGDs at most sites is very limited. In such cases, it shall be beneficial to optimise the available space when offered technology is capable to do so with equal effectiveness. Bidder offers Jet Bubbling Technology, which has excellent flexible operability even at turnaround ratios of 15%. We request NTPC to accept option of offering combined absorber for multiple units. Our collaborator has proven references of such common absorbers installed for multiple units operating successfully globally.	Bidder shall comply with the Technical Specification requirements.

S.No	Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications

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S.No	Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
930.	DWG No: 360/361-999- POC-F-001		General Layout Plan (Meja Thermal Power Project - Stage -I)	The space indicated in the GLP is inadequate for installation of FGD system. Based on Site visit the following space are not yet construction started or open. The same space to be proposed for FGD system 1) East side of unit #2 ESP 2) East side of ESP Control Room Unit #2 3) In-between Gird N 1000 to N 1200 & E 1000 to E 1200d 4) South side of the Coal stock pile area in between Grid N00 to N 245 and E650 to E 1150 NTPC to review and confirm	Bidder to refer Amended GLP being issued separately.
931.	DWG No: 9562-999-POC-F-001		General Layout Plan (Tanda Thermal Power Project- stage -II)	The space indicated in the GLP is inadequate for installation of FGD system. Based on Site visit the following space are not yet constructed or open. The same space to be proposed for FGD system 1) West side of ESP (Including drain and road) 2) In-between Gird N 900 to N 1100 & E 580 to E 600 NTPC to review and confirm 3) Hydrogen generation plant area NTPC to review and confirm	1. Space for road and drain cannot be used for FGD facilities. 2. Area in-between Gird N 900 to N 1100 & E 580 to E 600 is already allocated for erecting CHP workshop, O&M stores and laydown & pre-assembly activities. 3. Hydrogen generation plant cannot be relocated.

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S.No	Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
932.	DWG No: 9573-999-POC-F-001		General Layout Plan (Kudgi Super Thermal Power Project- stage -I)	The following additional space is proposed for FGD system 1) In-between Gird N 2200 to N 2280 & E1700 to E1780 NTPC to review and confirm	Bidder to refer Amended GLP being issued separately.
933.	DWG No: 9571-999-POC-F-001		General Layout Plan (Solapur Super Thermal Power Project- stage -I)	The following additional space is proposed for FGD system 1) In-between Gird N 350 to N 500 & E1200 to E1625 NTPC to review and confirm	The space between Gird N 350 to N 500 & E1200 to E1625 has been envisaged for stage-II and can not be used .
934.	DWG No: 9572-999-POC-F-001		General Layout Plan (Gadarwara Super Thermal Power Project- stage -I)	The space provided for FGD system installation in the GLP is Inadequate. NTPC to review and explore the same.	Bidder to refer Amended GLP being issued separately.
935.	DWG No: 9543-999-POC-F-001		General Layout Plan (Darlipali Super Thermal Power Project- stage -I)	The space indicated in the GLP is inadequate for installation of FGD system, The following additional space is proposed for FGD system 1) In-between Gird N 10050 to N 10400 & E7450 to E7650 NTPC to review and confirm	The space between Gird N 350 to N 500 & E1200 to E1625 has been envisaged for stage-II and can not be used.
936.	DWG No: 9561/9575-999-POC-F-001		General Layout Plan (Mauda Super Thermal Power Project- stage -I)	The space indicated in the GLP is inadequate for installation of FGD system, The following additional space is proposed for FGD system 1) North-West direction Ash silo NTPC to review and confirm	Bidder to refer Amended GLP being issued separately.

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S.No	Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
937.	DWG No: 0270-999-POC-F-001		General Layout Plan (Nabinagar BRBCL Thermal Power Project)	The following additional space is proposed for FGD system1) In-between Gird N 1500 to N 1449 & W 600 to W 750NTPC to review and confirm	Bidder to refer Amended GLP being issued separately.
938.	DWG No: 0370-999-POC-F-001		General Layout Plan (Nabinagar Thermal Power Project)	The following additional space is proposed for FGD system 1) In-between Gird N 1790 to N 1515 & E 1523 to E 1470 NTPC to review and confirm 2) In-between Gird N 2000 to N 1500 & E 2100 to E 1900 NTPC to review and confirm 3) In-between Gird N 1520 to N 1550 & E 1390 to E 1285 NTPC to review and confirm. 4) In-between Gird N 1520 to N 1550 & E 1200 to E 1270 NTPC to review and confirm. 5) In-between Gird N 1490 to N 1357 & E 1920 to E 2100 NTPC to review and confirm. 6) North side of Unit#1 (parallel to ESP and chimney) NTPC to review and confirm 7) South side of ESP unit#3. NTPC to review and confirm	Bidder to refer Amended GLP being issued separately.

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S.No	Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
939.	DWG No:9558/9560- 999-POC-F-001		General Layout Plan (Barh Thermal Power Project)	The space provided for FGD system installation in the GLP is inadequate. NTPC to review and explore the same.	Bidder to refer the revised GLP in issued amendments.
940.			General	For develop the duct routing NTPC is requested to furnish the Elevation drawing for the following facilities 1) TAC House 2) HCSD Pump House 3) HCSD Silos 4) Transformer 5) ASPH 6) AWPH 7) Switch gear room 8) ESP Control room	Bidder to refer the revised GLP in issued amendments.
941.			General	It is found that the GLPs provided in the tender document is not in line with "as built drawings". NTPC is requested to furnish the as built drawings for all the projects.	Bidder to refer the revised GLP in issued amendments.

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S.No	Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
942.	Section-VI, Part-B, Sub Section-I-M1	15 of 51	Head : For Spray tower Process actual requirement considering Choking/Blocakge of minimum 10% of the oxidation nozzles/Sparayers or minimum 8500mmwc whichever is higher	As per QFGDM technology requirment of maximum liquid level in the absorber is such that after considering all margins head requirement of the oxidation blower is much less than 8500mmwc. Threfore NTPC is requested to relax this criteria of minimum head of 8500mm.	Bidder shall comply with the requirements of Technical Specifications.

SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
943.	Part B/I/M Clause 5.01.00/ Page 14	Alternatively, the contractor may offer a spare spray level with each spray level served by an independent 100% capacity pump.	Is it one spare spray level or spray levels with the same number of spray levels in service?	Specification requirement is clear under the referred cl.no. 5.01.00. Bidder shall comply with the specification requirements.
944.	Part B/I/M Clause 7.07.07/Page 28	Contractor shall provide the complete lime dosing system to correct the pH of the waste water by lime dosing.	What is the desired pH for wastewater? Is there any other parameter set for wastewater?	Specification requirement is clear. Bidder shall comply with the specification requirements.
945.	Part B/I/M Clause 7.08.01/Page 29	It should be possible to discharge the each absorber into the emergency drain tank within 2 hours.	Is the emergency drain tank the same thing as the auxiliary absorbent tank?	Bidder's understanding is correct.
946.			Please clearly show the boundary of available FGD area.	Bidder to refer the revised GLP in issued amendments.
947.			Can we make optimized plan of valves which will be different from the PID?	Specification requirement is clear. Bidder shall comply with the specification requirements.
948.			Please offer CAD and Word documents of all necessary files.	Only PDF provided.
949.			Please confirm whether some of the slurry tanks can be anti-corrosion protected with rubber lining.	Specification requirement is clear. Bidder shall comply with

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
950.			Whether there is standard for the thickness of rubber lining. Also please confirm anti-corrosion material for the absorber.	the specification requirements.
951.			Please confirm the number of filtrate water tanks for 3x660MW FGD system.	Specification requirement is clear. Bidder shall comply with the specification requirements.
952.			Please confirm the number and the capacity of oxidation air fans for 3x660MW FGD system.	Specification requirement is clear. Bidder shall comply with the specification requirements.
953.			Please confirm the number of process water tanks for 3x660MW FGD system, also with the number and the capacity of each process water pump.	Specification requirement is clear. Bidder shall comply with the specification requirements.
954.			Please confirm if the fire water pressure does not meet the requirements, the pressurization system is not within the scope of the contract.	Specification requirement is clear. Bidder shall comply with the specification requirements.
			Please confirm whether clean flue gas after absorber will return back to the chimney that is already existing or discharge through the wet stack provided by the bidder. And if the condensate col-	Specification requirement is clear. Bidder shall comply with the specification requirements.

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
			lected could be reused in FGD system, there is no need to build condensate tank and other related equipment. Furthermore, if the wet stack is built on the absorber, 150 meters height will be the total height including the absorber.	
955.			Please provide the preliminary geo-technical investigation report.	Bidder to refer amendment.
956.			Please provide the topographic map of the area.	Topographic survey drawing already furnished with tender document
957.	TECHNICAL SPECIFICATIONS SECTION-VI,PART-A BID DOC NO:CS-0011-109(1A)-2,PAGE 2 OF 6	1.08.00 CABLING	If the cable tray between employers scope equipment and contractors scope equipment should be designed ,supplied and installed by employers.	Bidder understanding is not correct. Refer to the clause no:- 1.08.00.2 and comply with technical specification requirement
958.	TECHNICAL SPECIFICATIONS SECTION-VI,PART-A BID DOC NO:CS-0011-109(1A)-2,PAGE 3 OF 6	1.09.00 LIGHTING	Whether the employers have a requirement for the brand of LED lighting.	Technical Specifications are clear and Bidder shall comply with technical specifications requirement
959.	TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-0011-109(1A)-2PAGE 6 OF 7	D.C. Systems	Which kind of DC voltage will be supplied by employers,220V or 110V?	220V
960.	TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-0011-	1.00.00 GENERAL	If the employer will provide the 11KV power source and 3.3kv power source for FGD system? Could the employer provide the security power	Bidders query is not clear regarding security Power source for FGD system.

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
	109(1A)-2, PAGE 1 OF 7		source for FGD system.	Owner shall provide power to contractor at 11/6.6kV as per Amendment 1 to Tender SLD.
961.	TECHNICAL SPECIFICATION SECTION-VI, PART-B SUB-SECTION-III-C2 MEASURING INSTRUMENTS PAGE 22 OF 34	Continuous Emission Monitoring system consisting of the following equipments (Analysers/monitors) shall be provided for measurement of emissions in stack of each unit:- SO2/NOx Analyser CO analyser CO2 analyser Flue gas Flow Meter Flue gas temperature measurement(As defined under Particulate Emission Analyser) Particulate Emission (Stack Opacity) Analyser Mercury Analyser	Bidder has indicated 7 (SEVEN) sets of CEMS ONLY 7 (SEVEN) sets in stack of each unit in the drawing and indicated, no sets at flue gas inlet and no one at flue gas outlet in the drawing. Please confirm.	Bidder's query is not clear. However bidder to refer tender drawing no. 0011-109-POM-A-001 for minimum quantity of instrumentation to be provided in FGD inlet and outlet ducts.
962.	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOCUMENT NO.: CS-0011-109(1A)-2 SUB-SECTION-III-C5 PLC BASED CONTROL SYSTEM PAGE 1 OF 27	Contractor shall provide independent control systems for safe, efficient and reliable operation of each of the plant auxiliary systems. The type of control system shall be as indicated under scope part at III C, Part-A, Section VI	Confirmation Required: Please provide the system of the PLC brand, model and control scheme of the network; the engineer station/operator station and printer of PLC system, whether to need to separate configuration, if necessary, please provide brand and quantity Please confirm.	Bidder to refer PLC configuration tender drg. No. 0000-151-POI-A-013. The make and model of PLC shall be NTPC QA approved.

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
963.	TECHNICAL SPECIFICATION		Bidder to note that CCTV is not included in this package and hence not to be provided by bidder. Please confirm.	Bidder's understanding is correct.
964.		Bidder Offer: Bidder has indicated All technical manuals, reference manuals, user's guide etc., in English required for modification/editing/addition/deletion of features in the software of the PLC System shall be furnished. The Contractor shall furnish a comprehensive list of all system/application software documentation after system finalization for Employer's review and approval	Confirmation Required: Bidder to note that technical manuals, reference manuals, user's guide etc shall be finalized during detail engineering as per the approved P&ID and specification requirements, hence bidder to confirm that all instruments shall be supplied as per the approved P&ID and control write-up without any cost implication to Owner. Please confirm.	Bidder's query is not clear. Bidder shall comply with clause 12.01.00, PART-B, Sub Section IIIC-5 of technical specification.
965.	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOCUMENT NO.: CS-0011-109(1A)-2 SUB-SECTION-III-C1 BASIC DESIGN CRITERIA PAGE 3 OF 4	Bidder Offer: Further, flue gas desulphurization system, link shall be provided for collection of data in the DDCMIS (In Employer's Scope) in UCR for the information of unit-incharge / shift-incharge etc. through Station Wide LAN.	Confirmation Required: Bidder to note the supply scope of the collection of data in the DDCMIS (In Employer's Scope) in UCR for the information of unit-incharge Please confirm.	It is clarified that bidder shall provide a link for collection of data in the DDCMIS (In Employer's Scope) in UCR for the information of unit-incharge / shift-incharge etc. through Station Wide LAN. Bidder shall comply with the specification requirement.
966.	TECHNICAL SPECIFICATION	Bidder Offer: Bidder shall include	Confirmation Required: Bidder has indicated "pro-	Bidder's query is not clear.

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
	SECTION-VI, PART-B BID DOCUMENT NO.: CS-0011-109(1A)-2 SUB-SECTION-III-C1 BASIC DESIGN CRITERIA PAGE 1 OF 4	in his bid a detailed Bill of Material (BOM) for each of the systems.	vided during detail engineering' against most to the requirement. In view of the same, it is found that bidder filled datasheet is preliminary and incomplete. Please confirm.	However, Bidder shall comply with the specification requirement.
967.	ECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOCUMENT NO.:CS-0011-109(1A)-2 SUB-SECTION-III-C4 INSTRUMENTATION CABLES PAGE 1 OF 13	Bidder Offer: The Bidder shall furnish all material and services required for the completeness of the work identified in his scope as per this specification.	Bidder Offer: Bidder has indicated different types of cables and cable trays in the offer. Confirmation Required: Bidder to note the type and length of cable, cable trays shall be finalized during detail engineering as per the routing and system requirement. In view of above bidder to note that all cables, cable trays shall be supplied "on as required basis" as per actual site requirement without any cost implication to Owner. Further bidder shall comply to the cable specification requirement. Please confirm.	Bidder's query is not clear. However, Bidder shall comply with the specification requirement.
968.	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOCUMENT NO.: CS-0011-109(1)-2 SUB-SECTION-III-C2 MEASURING INSTRUMENTS PAGE 1 OF 34	Confirmation Required: Bidder to note that indicated the Instruments are not correct. Bidder to include the following in the offer: 1. Instruments shall be provided with wetted parts (e.g. diaphragm	Please confirm.	Bidder's query is not clear. However, Bidder shall comply with the specification requirement.

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
		seal, etc.) made of Tantalum 2、 For coastal areas, all instruments shall be provided with durable epoxy coating for housings and all exposed surfaces of the instruments 3、 All instruments envisaged for sea water applications, shall be provided with wetted parts made of Monel/ Hastelloy C or any other material (if provenness experience of the proposed material for such applications is established by contractor)		
969.			Please provide the preliminary geo-technical investigation report.	Bidder may refer Errata 1 A8 Rev.1 project information chapter.
970.			Please provide the topographic map of the area.	Refer amendment issued separately.
971.				
972.	SCOPE OF SUPPLY & SERVICES	1.06.00 P34 Limestone shall be supplied by the Employer.	Please clarify that the expense of water, power, and compressed air consumed during Commissioning & PG testing should be borne by contractor or by purchaser. Whether the limestone should supplied by employer during Commissioning & PG testing.	Specification requirement is clear at clno 1.06.00 . Bidder shall comply with the specification requirements.
973.			Whether need to erect a chemical laboratory for	Bidder shall comply with the

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SN	Vol/Section/Clause/Page	Existing Specification	Bidder's Query	NTPC CLARIFICATIONS
			Daily operation, and which part shall supply the related tools and chemicals before Acceptance.	specification requirements.

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No.	The original	Clarification	NTPC Clarifications
975.	PDF format	Please provide tender document in word format.	Only PDF provided.
976.	Part A: National and international codes and standard, especially the Indian statutory regulations	Which codes and standard should be adopted for manufacturing all the equipment used in FGD plant?	Bidder shall comply with the specification requirements.
977.		What is the spare capacity(KVA) of the 11KV transformer? How many stages does the 11KV transformer have? How many voltage switchgear spare locations can be used?	Specification requirement is clear. Bidder shall comply with the specification requirements.
978.		What is the spare capacity(KVA) of the 3.3KV transformer? How many stages does the 3.3KV transformer have? How many voltage switchgear spare locations can be used?	Specification requirement is clear. Bidder shall comply with the specification requirements.

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No.	The original	Clarification	NTPC Clarifications
979.		What is the spare capacity(KVA) of the emergency MCC section? How many stages does it have? How many voltage switchgear spare locations can be used?	Specification requirement is clear. Bidder shall comply with the specification requirements.
980.	PART-B-I-MECH: Three stage chevron type Mist Eliminators (ME) made of polysulfone or stainless steel shall be provided at the exit of the absorber	According our patent technology "Centrifugal technology" is able to replace the two-stage mist eliminators and to meet the owner's requirements.	Specification requirement is clear. Bidder shall comply with the specification requirements.
981.	Pate E: All variations shall be clearly brought out in the technical deviation schedule with implications	Due to the time limits, is it possible that we only bring out the main variations?	Specification requirement is clear. Bidder shall comply with the specification requirements.
982.	PART-B-I-MECH: The contractor shall provide evaporative	Could you accept other zero liquid discharge process?	Bidder's Query is not clear. Bidder has not provided any detail about his zero liquid discharge process.

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No.	The original	Clarification	NTPC Clarifications
	concentration process for FGD Wastewater Treatment Plant to achieve zero liquid discharge (ZLD)		
983.	PART-A: The Contractor, shall take into account the entire characteristics of expected combination of fuels to be fired, for the complete load range of operation and the expected numbers of Steam Generator start-ups while designing the Chimney flue liner considering Steam Generator in operation both with & without FGD system in operation. The chimney flue liner cladding shall be made of 2 mm thick Titanium (Grade 2 as per ASME SB265) or C-276 alloy	Please provide the drawing of the existing stack.	Same will be provided/discussed with the successful bidder.

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No.	The original	Clarification	NTPC Clarifications
	over 8 mm thick (minimum) mild steel base metal of flue liner. Cladding shall be done to achieve the required quality as per ASTM B 898-11. External surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet over insulation. The wet stack shall be designed as per the guidelines of EPRI Revised Wet Stack Design Guide .		

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Sr. No.	Sec- tion/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
984.						Please provide the layout of each power plant in CAD format in the tender files	Only PDF provided.
985.						Please provide the data sheets in word format for edit.	Only PDF provided.
986.						Please provide the editable version of the PDF of the tender files, it will be convenient for us to copy word from tender files.	Only PDF provided.
987.						Please provide the analysis of the process water of each power plant, especially the concentration of the Cl- in the water. It is extremely important for FGD design	Bidder to refer Design water analysis provided in the Technical specification.
988.						Please provide primary geological survey for each power plant, such as geological survey of BTG part.	Bidder to refer necessary amendment in this regard.

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Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
989.	SECTION-VI-PART-B	SUBSECTION-I-M1	12 of 51	4.07.00	(a) Model of operation, ii) one fan (one stream in operation)	Does it mean that one BUF of each unit is standby and the other is in operation? Please give us the exact description.	Specification requirement is clear under the referred cl.no. 4.01.01 . Bidder shall comply with the specification requirements.
990.	SECTION-VI-PART-B	SUBSECTION-I-M1	13 of 51	4.08.00	The fan shall be suitable for parallel operation and sharing the load capacity over the entire range of operation without hunting. Pulsation shall be avoided by suitable design of fan and	Last sentence seems to be uncompleted. Please clarify detail description or requirement.	Specification requirement is clear. . Bidder shall comply with the specification requirements.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
991.	SECTION-VI-PART-B	SUBSECTION-I-M1	15 of 51	5.03.02	For spray tower process actual requirement considering choking /blockage of minimum 10% of the oxidation nozzles/sprayers or minimum 8500 mmwc whichever is higher.	We are using large size pipe as oxidation nozzle, our diameter can reach 100mm, it is not likely for our pipe to get choked. And since we have only 4-5 nozzles according to absorber agitators. we request that no margin of oxidation nozzle considered for large size oxidation pipe.	Specification requirement is clear under the referred cl.no. 5.03.02 . Bidder shall comply with the specification requirements.
992.	SECTION-VI-PART-B	SUBSECTION-I-M1	17 of 51	5.06.06	three stage chevron type Mist Eliminators (ME) made of polysulfone or stainless steel shall be provided at the exit of the absorber	We suggest that PP instead polysulfone or stainless steel be used. PP is widely applied in China as MOC of ME. Currently no vendor can provide ME with polysulfone or stainless steel.	Bidder shall comply with the requirements of the Technical Specifications.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
993.	SECTION-VI-PART-B	SUBSECTION-I-M1	19 of 51	5.06.11	the absorber oxidation tank, absorber tower & absorber outlet duct shall be provided with 2 mm (minimum) thickness lining/cladding/wall paper if Alloy C276/Alloy 59 or better material.	We suggest that 4mm rubber lining instead alloy C276/Alloy 59 be used. 4mm rubber lining is widely applied in China as lining of absorber.	Bidder shall comply with the requirements of the Technical Specifications.
994.	SECTION-VI-PART-B	SUBSECTION-I-M1	19 of 51	5.06.13	All internal members shall be lined with minimum 2 mm Alloy 59/C276	We suggest that 2mm rubber lining instead alloy C276/Alloy 59 be used. 2mm rubber lining is widely applied in China as lining of internal members.	Bidder shall comply with the requirements of the Technical Specifications.
995.	SECTION-VI-PART-B	SUBSECTION-I-M1	19 of 51	5.06.14	The absorber wet-dry interface shall be made of solid Alloy 59 or C276 of minimum 6 mm thickness	We suggest that carbon steel with 2mm C276 lining instead alloy C276/Alloy 59 be used. 2mm C276 lining is sufficient for wet-dry interface, solid alloy 59 or C276 would cost a lot of money	Bidder shall comply with the requirements of the Technical Specifications.

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Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
996.	SECTION-VI-PART-B	SUBSECTION-I-M1	19 of 51	5.06.15	the other bridges (supports) shall be lined with minimum 2 mm Alloy 59/C276.	We suggest that 2mm rubber lining instead alloy C276/Alloy 59 be used. 2mm rubber lining is widely applied in China as lining of supports.	Bidder shall comply with the requirements of the Technical Specifications.
997.	SECTION-VI-PART-B	SUBSECTION-I-M1	22 of 51	6.05.01	(ii) Flow 110% of limestone requirement of two absorbers at design point	This is the common rule for all the projects. But different power plants have different Nos. of units. Like Barh has 3x660MW units, so how could we set the capacity of the wet ball mill?	Bidder shall size the wet ball mill based on the 110% of limestone requirement of all the units at design point.
998.	SECTION-VI-PART-A	SUBSECTION - V	22 OF 26	10.07.00	1) Crushers 2x50% or 1x100%	How many hrs does a crusher operate one day? Please define 100% capacity for each crusher	Specification requirement is clear under the referred cl.no. 10.07.00 . Bidder shall comply with the specification requirements.

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Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
999.	SECTION-VI-PART-B	SUBSECTION-I-M1	29 of 51	7.08.01	It should be possible to discharge the each absorber into the emergency drain tank within 2 hours.	Actually it's impossible to achieve the requirement, because the slurry discharge pipe is above ground and the remaining slurry would be first discharged to sump, and then discharged to emergency tank. We suggest that most of slurry in absorber be discharged to emergency tank in 2 hours and the remaining be discharged to emergency tank through sump pump in another 2 hours.	Bidder shall comply with the requirements of the Technical Specifications.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Sec- tion/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 02-08-2017	NTPC's Clarification
1000	Amendment No.1 to Section VI	Part A	1 of 1	1.01.01	Government of India has launched "Make in India" initiative to transform India into aglobal design and manufacturing hub. Accordingly, to promote manufacturing within India, the import content in Flue Gas Desulphurisation (FGD) System package has been restricted to 30% of the total Supply value quoted by Bidder in Price Schedule-1 plus Schedule-2 Bidder shall ensure that it does not import more than 30% of its Supplies and shall manufacture/source equipmentUcomponents from within India to meet the aforesaid requirement.	please clarify detail requirement about this term. if import value proposed more than 30% of Price Schedule-1 plus Schedule-2 will be rejected or still be acceptable but will evaluate the price seperately with other policy?	Bidder to refer clarifications being issued separately.
BIDDING DOCUMENT NO.: CS-0011-109(1A)-2				Doc No:	CS-0011-109(1A)-2-CLRF-TECH-01		

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



No.	Page	location	Content in the tender documents	clarification	NTPC Clarifications								
	Technical part												
	Process												
1001.	3,5	PART A SUB-SECTION-V	<table><tr><th>CLAUSE NO.</th><th>SALIENT DESIGN DATA</th></tr><tr><td>2.00.00</td><td>  The Flue Gas Desulphurisation (FGD) System FOR MOUDA-II 2X660 MW, TANDA-II 2X660 MW, NABINAGAR-I 3X660 MW, MEJA-I 2X660 MW & BARH-I 3X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below: </td></tr><tr><th>CLAUSE NO.</th><th>SALIENT DESIGN DATA</th></tr><tr><td>3.00.00</td><td>  The Flue Gas Desulphurisation (FGD) System for SOLAPUR-II 2X660 MW & MEJA-I 2X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below: ----- </td></tr></table>	CLAUSE NO.	SALIENT DESIGN DATA	2.00.00	 The Flue Gas Desulphurisation (FGD) System FOR MOUDA-II 2X660 MW, TANDA-II 2X660 MW, NABINAGAR-I 3X660 MW, MEJA-I 2X660 MW & BARH-I 3X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below:	CLAUSE NO.	SALIENT DESIGN DATA	3.00.00	 The Flue Gas Desulphurisation (FGD) System for SOLAPUR-II 2X660 MW & MEJA-I 2X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below: -----	For the Meja-I power plant, the condition at two places in the tender documents is different, i.e. flue gas volume and sulfur content is different, please specify which one we should comply with.	Refer necessary amendment in this regard.
CLAUSE NO.	SALIENT DESIGN DATA												
2.00.00	 The Flue Gas Desulphurisation (FGD) System FOR MOUDA-II 2X660 MW, TANDA-II 2X660 MW, NABINAGAR-I 3X660 MW, MEJA-I 2X660 MW & BARH-I 3X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below:												
CLAUSE NO.	SALIENT DESIGN DATA												
3.00.00	 The Flue Gas Desulphurisation (FGD) System for SOLAPUR-II 2X660 MW & MEJA-I 2X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below: -----												
1002.			Capacity Stage-I : 3 x 660 MW - Under Construction -Present proposal Stage-II : 2 x 660 MW - Under Operation  Capacity Stage-I : 2 x 800 MW - Present proposal Stage-II : 2 x 800 MW - In Future 	1. For the unit which is already under operation (Figure 1 stage-II), whether the desulfurization system has been installed. If so, whether the common utility of the new build de-	Bidder shall comply with the requirements of Technical Specifications.								

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No.	Page	location	Content in the tender documents	clarification	NTPC Clarifications
				sulphurization utility can be combined with that of operating unit? 2. For the units that have not yet been built (see Figure 2 stage-II), whether the new desulphurization system needs to consider the reserved space and capacity? The rest of the project is similar	
1003.	8	PART A SUB-SECTION-V	5.00.00 Chimney A "wet Chimney" shall be installed downstream of Wet Flue Gas Desulfurization (FGD) system by the Contractor. Clean gas from the absorber shall be taken through three stage mist eliminators. Treated flue gas from the absorber shall be discharged through a wet stack without reheating of the flue gas.	1. Please clarify that the wet chimney is based on the original chimney for retrofitting or create a new chimney. (But the original chimney has clearly	New wet chimney is in the scope of the Contractor. Location of wet chimney is to be decided by the Bidder based on his layout.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



No.	Page	Location	Content in the tender documents	clarification	NTPC Clarifications				
1004.	9	PART A SUB-SECTION-III-A1	<table><tr><td>25.00.00</td><td>Wet Stack Condensate Collection System</td></tr><tr><td>25.00.01</td><td>Wet stack of 150 metre height shall be provided with a stack condensate collection system to avoid the carryover of the condensate/acidic dews/water droplets/Gypsum coming out of the stack. Design of the wet stack condensate system should be such that all the condensate are collected in the stack itself and no water droplet/condensate come out of the chimney and preventing falling of the acidic dews/water droplet/gypsum from the chimney in the plant/nearby area.</td></tr></table>	25.00.00	Wet Stack Condensate Collection System	25.00.01	Wet stack of 150 metre height shall be provided with a stack condensate collection system to avoid the carryover of the condensate/acidic dews/water droplets/Gypsum coming out of the stack. Design of the wet stack condensate system should be such that all the condensate are collected in the stack itself and no water droplet/condensate come out of the chimney and preventing falling of the acidic dews/water droplet/gypsum from the chimney in the plant/nearby area.	specified that it belongs to the scope of the contractor) 2. If the new chimney is needed, please specify the location of wet chimney (whether built at the top of the absorption tower) and height. Please explain why the 150m wet chimney requires a condensate system, based on our experience, all the wet stack need condensate system, no matter what the wet stack height is.	Bidder shall comply with the requirements of Technical Specifications.
25.00.00	Wet Stack Condensate Collection System								
25.00.01	Wet stack of 150 metre height shall be provided with a stack condensate collection system to avoid the carryover of the condensate/acidic dews/water droplets/Gypsum coming out of the stack. Design of the wet stack condensate system should be such that all the condensate are collected in the stack itself and no water droplet/condensate come out of the chimney and preventing falling of the acidic dews/water droplet/gypsum from the chimney in the plant/nearby area.								
1005.	1	PART A SUB-SECTION-III-A6	<table><tr><td>1.00.00</td><td>FGD WASTE WATER TREATMENT (FGD WWT) SYSTEM FOR ZLD</td></tr><tr><td>1.00.01</td><td>General A FGD Waste Water Treatment (FGD WWT) System for Zero Liquid Discharge (ZLD) shall be provided by the Contractor for storing, treating and re-using all wastewaters generated from Wet Limestone based FGD system for Barh STPP SL-I (3x660MW) and Nabinagar TPP (4x250 MW) Units. The contractor shall provide evaporative concentration process for FGD</td></tr></table>	1.00.00	FGD WASTE WATER TREATMENT (FGD WWT) SYSTEM FOR ZLD	1.00.01	General A FGD Waste Water Treatment (FGD WWT) System for Zero Liquid Discharge (ZLD) shall be provided by the Contractor for storing, treating and re-using all wastewaters generated from Wet Limestone based FGD system for Barh STPP SL-I (3x660MW) and Nabinagar TPP (4x250 MW) Units. The contractor shall provide evaporative concentration process for FGD	Please clarify whether wastewater after treatment can be concentrated and cooling sprayed before entering the ESP	Bidder shall comply with the requirements of Technical Specifications.
1.00.00	FGD WASTE WATER TREATMENT (FGD WWT) SYSTEM FOR ZLD								
1.00.01	General A FGD Waste Water Treatment (FGD WWT) System for Zero Liquid Discharge (ZLD) shall be provided by the Contractor for storing, treating and re-using all wastewaters generated from Wet Limestone based FGD system for Barh STPP SL-I (3x660MW) and Nabinagar TPP (4x250 MW) Units. The contractor shall provide evaporative concentration process for FGD								

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No.	Page	location	Content in the tender documents	clarification	NTPC Clarifications
1006.	2	PART A SUB-SECTION-III-A5	2.00.0 2.01.00 2.01.01 DETAILED SCOPE Limestone Handling Plant (LHP) Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes.	duct so that water can be also fully utilized. Please clarify whether the limestone crusher is built at the discharge site or integrated with the limestone slurry preparation system.	Same will be discussed during post bid discussions after submission of techno-commercial bid.

S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
1007.	TECHNICAL SPECIFICATION SECTION – VI, PART-A / SUB SECTION-III-A1 FGD	5.03.00	Page 5 of 9	This system shall be comprising of 2x100% gypsum dewatering system with each stream sized to dewater 110% of the maximum gypsum produced by all the unit's operating simultaneously at Design Point, with any range of limestone specified	2 x 100% (1W + 1S) vacuum belt filter shall be considered for this project. Each belt filter shall be designed to meet the requirement of gypsum produced from all unit of one project. Please confirm	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.03.00.
1008.	TECHNICAL SPECIFICATION SECTION – VI, PART-A / SUB SECTION-III-A1	5.05.00	Page 5 of 9	The overflow from the primary set of hydro-cyclone shall be taken to a common Secondary hydro cyclone feed tank	Secondary Hydrocyclone is not foreseen as the installation of a lamella separator is required to remove the high amount of inert material and transport it to	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.05.00.

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
	FGD				the waste water treatment plan. There is not foreseen any feed tank but the overflow from the primary set will be taken directly to the lamella separator	
1009.	TECHNICAL SPECIFICATION SECTION – VI, PART-A / SUB SECTION-III-A1 FGD	5.05.00	Page 5 of 9	2x100% Secondary hydro cyclone pumps shall be provided to feed 2x100% secondary hydro-cyclones	2 x 100% (1W+ 1S) lamella separators have been considered. Each lamella separator is capable of handling waste water produced from all units of one project.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.05.00.
1010.	TECHNICAL SPECIFICATION SECTION – VI, PART-A / SUB SECTION-III-A1 FGD	5.04.00	Page 5 of 9	2x100% pump shall be provided to supply wash water (for cake washing as well as belt cloth washing) to the belt filters	Filtrate from VBF shall be taken for the cake washing. And for cloth washing clarified water provided by client shall be considered	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.04.00.
1011.	PID No. 0011-109-POM-A-003 Rev No A					
1012.	TECHNICAL SPECIFICATION SECTION-VI, PART-A / SUB-SECTION-V SALIENT DESIGN DATA & SIZING	7	Page 1 of 26	Flue gas Analysis for design case Percentage of H2O (v/v)	This value seems to be wrong. Please clarify	Bidder to refer necessary amendment in this regard.
1013.	TECHNICAL SPECIFICATION SECTION-VI, PART-A / SUB-SECTION-V	7	Page 1 of 26	(vi) Inlet SO2 (mg/Nm3-wet) 1915	Bidder request client to confirm that the value furnished here either for actual O ₂ or 6% O ₂	Specification requirement is clear under the referred cl.no. 2.00.00 . Bidder shall comply with the specification require-

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
	SALIENT DESIGN DATA & SIZING					ments.
1014.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	1.03.08	Page 3 of 51	In case of a power failure all items of equipment (e.g. minimum one agitator in absorber and limestone slurry tank, flue gas damper upstream & downstream of FGD, Process water pump & lube oil system of Booster Fan & Ball Mill) which may cause irreversible damage to the FGD System shall be connected to the emergency power supply system to be provided by the Contractor	The agitators in absorber are not necessary connect to the emergency power supply	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 1.03.08.
1015.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	3.02.04	Page 6 of 51	The duct from Absorber outlet to bypass duct shall be made of Carbon steel of minimum 7mm thickness with 2 mm (minimum) thickness lining / cladding / wall paper of Alloy C276 / Alloy 59 or better material	Bidder is having good experience with glass flake lining in clean gas duct. Client shall accept glass flake lining in clean gas duct.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 3.02.04.
1016.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.01.00 (A) (iv)	Page 14 of 51	The slurry recirculation pumps shall have motor driven knife gate valve at pump suction and discharge side	Bidders having very good experience with butterfly type. Body and other parts which are in contact with slurry shall be lined to provide better life time.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.01.00.
1017.	TECHNICAL SPECIFICATION	5.02.00	Page 15 of 51	the contractor shall offer and demonstrate mixing arrangement	Absorber can be operated intermittently with N-1 numbers	Specification requirement is clear in this regards. Bidder shall

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
	SECTION-VI / PART-B SUB-SECTION-I-M1			such that n-1 number of agitators are sufficient to avoid the slurry settlement in the absorber tank in case of one agitator under breakdown	of agitators without compromising the performance of the plant.	comply with the specification requirements under the referred cl.no. 5.02.00.
1018.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.02	Page 17 of 51	Homogeneity shall be ensured, if the deviation from average is less than +10%	Homogeneity shall be less than +/- 30%	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.06.02.
1019.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.03	Page 17 of 51	Inaccessible gaps or hollow beams shall be avoided	Support beams of absorber shall be lined with rubber. Other type/section of beams with sharp inside edges can't be lined effectively and will get corroded frequently. To avoid this bidder provides the hollow beams to support internal.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.06.13 & 5.06.15.
1020.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.06	Page 17 of 51	Three stage chevron type Mist Eliminators (ME) made of polysulfone or stainless steel shall be provided at the exit of the absorber	We use ME made of PP (Polypropylene). This material is proved and shows best results	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 5.06.06.
1021.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.06	Page 18 of 51	The headroom shall have a height of more than 2200 mm.	Please confirm and clarify the head room required.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements.
1022.	TECHNICAL SPECIFICATION SECTION-VI / PART-B	14.16.00	Page 36 of 51	Minimum Headroom (free height) under all floors, ducts, walkways and stairs shall be 2.50 M		

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
	SUB-SECTION-I-M1					
1023.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.10	Page 19 of 51	The raw gas inlet duct of the absorber shall be equipped with a flushing device of the side walls and the ground, which shall operate continuously as well as intermittently	Continuous operation of inlet flushing is not possible because of water balance in the absorber.	Bidder shall comply with the specification requirements under the referred cl.no. 5.06.10.
1024.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.11	Page 19 of 51	The absorber oxidation tank, absorber tower & absorber outlet duct shall be provided with 2 mm (minimum) thickness lining / cladding / wall paper of Alloy C276 / Alloy 59 or better material	Absorber oxidation tank and tower are all with one single scrubber construction. Most feasible solution is to have rubber lining inside carbon steel shell for complete absorber vessel including oxidation tank. And also internal members of absorber shall also be lined with rubber. Please confirm	Bidder shall comply with the specification requirements under the referred cl.no. 5.06.11.
1025.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.13	Page 19 of 51	All internal members shall be lined with minimum 2 mm Alloy 59/ C276. All metallic fasteners which are provided inside the absorber/absorber wet-dry interface ducting shall be of Alloy 59/ C276		Bidder shall comply with the specification requirements under the referred cl.no. 5.06.13 & also under the referred cl.no. 5.06.15.
1026.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	5.06.18	Page 20 of 51	A flushing device of the spray levels with water shall be installed. Flushing shall take place if spray levels are out of operation	A flushing device is installed at the recirculation pipe. This will also flush the spray bank after shut down	NTPC NOTED.
1027.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	8.06.00	Page 30 of 51	All the pump wear parts in contact with the slurry shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled	Silicon carbide shall also be accepted for all slurry pumps, not only for recirculation pumps.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the re-

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
1028.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	12.02.00	Page 33 of 51	The Contractor can provide slurry pipes of size lower than 3" made up of FRP material (silicon carbide coating on slurry exposed surface) if it has previous experience of providing the same	FRP pipes will be used from 1" up to larger diameters including recirculation pipes. Slurry exposed surface is protected by pure resin layer of 2 mm thickness.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements under the referred cl.no. 12.02.00.
1029.	TECHNICAL SPECIFICATION SECTION-VI / PART-B SUB-SECTION-I-M1	1.03.06	Page 3 of 51	The FGD and the ancillary facilities shall be suitable for unlimited operation with all transients and at any load point between the minimum and maximum load point of the Steam Generator	Absorber shall be designed for the salient data of tender specification. And other minimum load cases are not found in the tender documents. Bidder request client to provide flue gas parameter for all load cases to check	Specification requirement is clear. Bidder shall comply with the specification requirements.
1030.	PID No. 0011-109-POM-A-003 Rev No A				Seal water for vacuum pump shall be from clarified water. Because chlorine content present in filtrate water will be very high. For optimum design, clarified water shall be used as seal water of vacuum pump	NTPC noted.
1031.	PID No. 0011-109-POM-A-001 (a) Rev No A				Recirculation line from the outlet of gypsum bleed pump again back to absorber is not required. Recirculation shall be switched on when the required density of gypsum is not	NTPC noted.

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
					achieved; this shall be performed thro primary hydrocyclone and filtrate tank then again back to absorber.	
1032.	PID No. 0011-109-POM-A-001 (a) Rev No A				PH Meter and Density meter shall be located at the outlet of gypsum bleed line. This is the feasible solution to control PH value in the absorber oxidation tank and also control sorbent feed.	NTPC noted.
1033.	Project Information / Design clarified / water analysis / Note			As CW blow down water is tapped from CW system, the water quality of CW blow down shall accordingly be arrived by the bidder	We requests NTPC to provide the analysis for CW Blow down to enable us to design equipment's and scrubber.	Design Clarified Water Analysis provided in Technical specification based on which quality of CW blow down water shall arrived by the bidder considering Cycle of concentration (COC) specified.
1034.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A1	3.01.04	Page 3 of 9	2x100% limestone slurry pumps for each absorber connected to each of the limestone slurry tank (total 4 nos, of pumps for 2x800MW) each pump catering to slurry requirement of each units absorber.	Accordingly, we are considering slurry pumps as indicated below 1) For 3x800MW : 6 nos of slurry pumps 2) For 2x660MW : 4 nos of slurry pumps 3) For 3x660MW : 6 nos of slurry pumps 4) For 4x250MW : Please confirm each absorber no of	Bidders understanding is correct. As asked, For 4x250MW : Total eight nos. of pumps for four units.

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S.No	Volume / Section	Clause No.	Page No.	Description / Tender specification	Bidder comments / Deviations	NTPC Clarifications
1035.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A1	7.01.00	Page 5 of 9	Process water & cooling water storage & pumping scheme (For 2x800MW)	pumps and total number of pumps four units. Kindly confirm. We understand that 2nos process water tanks along with 2x100% Booster water pumps required for 2x800MW, 3x800MW, 2x660MW, 3x660MW & 4x250MW. Kindly confirm.	Specification requirement is clear in this regards. Bidder shall comply with the specification requirements.
1036.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A1	7.01.01 & 02	Page 6 of 9	2x100% process water pumps (total 4 nos, of pumps for 2x800MW) & 2x100% mist eliminator wash water pumps..... (total 4 nos, of pumps for 2x800MW)	Accordingly, we are considering Process water pumps & Mist Eliminator Wash water pumps quantity as indicated below 1) For 3x800MW : 6 nos of pumps 2) For 2x660MW : 4 nos of pumps 3) For 3x660MW : 6 nos of pumps 4) For 4x250MW : Please confirm each absorber no of pumps and total number of pumps four units. Kindly confirm.	Bidders understanding is correct. As asked, For 4x250MW: Total eight nos. of pumps for four units.
1037.	TECHNICAL SPECIFICATION SECTION-VI / PART-A	25.00.00	Page 9 of 9	Wet stack condensate collection system	Each unit a separate wet stack is required or common wet stack shall be considered based on	Specification requirement is clear in this regards at referred cl. 25.00.00. Bidder shall comply

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	SUB-SECTION-III-A1				layout feasibility. Kindly confirm.	with the specification requirements.
1038.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A4	1.00.00	Page 3 of 3	Equipment cooling water system	Equipment cooling water system requirement for Solapur-II, 2x660MW not indicated. Kindly furnish the information.	Bidder may please refer scope of supply and services indicated on Page 3 of 3, Sub Section IIIA-04 for Solapur.
1039.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A5	2.01.15	Page 4 of 6	Minimum four (4) nos of sump pumps in limestone storage shed.....	2 Nos of sump pumps in limestone storage shed is sufficient.	Technical Specification is clear. Bidder to provide minimum four numbers of sump pumps in limestone storage shed.
1040.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A6	1.01.00	Page 1 of 3	FGD waste water, GGH washing water etc.....	In this tender GGH is not specified in FGD process scope of supply. Hence, GGH washing water requirement not required.	Bidder's understanding is correct. GGH washing water is not required as GGH is not envisaged.
1041.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-V	6.00.00	Page 10 of 26	Limestone characteristics	1. NTPC to confirm that given limestone characterises is for all units. 2. Please specify the limestone quality for design point and guarantee points.	Requirements of Technical Specification are clear at referred cl.no. 6.00.00.
1042.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-V	10.03.00	Page 21 of 26	2x100% (1W+1S) conveying stream shall be provided in CHP.	CHP area conveying system is not in FGD bidder scope of supply. However, only required modification in existing coal conveyor or new conveyor from track	Confirmed.

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1043.					hopper/wagon tippler to lime crusher is in FGD bidder scope of supply. Kindly confirm.	
1044.	TECHNICAL SPECIFICATION SECTION-VI / PART-A SUB-SECTION-III-A1	23.00.00	8 of 9	Layout observation for All 11 projects Booster fan	It is presumed that NTPC has checked all the obstructions/interfaces with existing structures/foundations/equipment's and accordingly allocated the space in all plants free of encumbrances for all FGD facilities. Considering layout space issue we propose 1x100% booster fan for each unit instead of 2x50%. Kindly confirm it is acceptable or not.	NTPC has taken all due diligence in allocating space for FGD. However, as per specification requirement, bidder is required to visit site and make his own assessment. Bidder's understanding is not correct. Specification requirement is clear at referred cl.no. 23.00.00. Bidder shall comply with the specification requirements.
1045.			Layout Constraints & Space	Mouda-II-2x660MW Allocated space: 1) 8m x 70 m-Left side of chimney 2) 8m x 70 m-Right side of chimney 3) 50 m x 39 m(17m x 12 m corner cutting) 4) 45 m x 90 m(15mx 30m corner	Mouda-II-2x660MW 1) In the layout allocated space is not sufficient for all FGD equipment's/buildings/facilities. 2) As per the layout, it is possible to locate Booster fan, absorber with pump house,	Available area is shown in amended GLP being issued separately. However, as per specification requirement, bidder is requested to visit site and make his own assessment.

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				cutting) 5) 78 m 139 m	common (not individual) wet stack, lime grinding building, gypsum dewatering building only. 3) Other facilities like Lime handling shed, Gypsum handling shed, Electrical building, and tanks etc we are not having sufficient space to accommodate in the layout. 4) Hence, we request NTPC to identify and allocate the space to accommodate these facilities with all in-cumbrancers.	
1046.			Layout Constraints & Space	SOLAPUR 2X660MW Allocated space: 1) 50m x 70 m-Left side of chimney 2) 25m x 40 m-Right side of chimney	SOLAPUR 2X660MW 1) In the layout allocated space is not sufficient for all FGD equipment's/buildings/facilities. 2) As per the layout, the allocated FGD space (50x70m) is sufficient for 2 absorbers along with common (not individual) wet stack and pump house. 3) Other facilities like limestone	Available area is shown in GLP. However, as per specification requirement, bidder is requested to visit site and make his own assessment.

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					grinding building, gypsum dewatering building, Lime handling shed, Gypsum handling shed, Electrical building, and tanks etc we are not having sufficient space to accommodate in the layout. 4) Hence, we request NTPC to identify and allocate more space to accommodate these facilities with all incumbrancers/clearances.	
1047.			Layout Constraints & Space	NABINAGAR 4X250MW Allocated space: 1) Approx. 35mx275m 2) Approx. 40x410m	1) As per the layout the allocated FGD space is sufficient for absorber, booster fan, wet stack and limestone grinding system, gypsum dewater buildings only. 2) Other areas like electrical buildings, lime handling system shed etc we are not having sufficient space to accommodate in the layout. We request NTPC to identify and indicate the suitable	Available area is shown in GLP. However, as per specification requirement, bidder is requested to visit site and make his own assessment.

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					space in the layout. 3) In layout allocated space is not sufficient for all FGD equipment's/buildings, facilities. NTPC may suggest additional space.	
1048.			Layout Constraints & Space	MEJA 2X660MW Allocated space: 1) Approx. 75mx65m	1) No area marked in the plot plant for FGD space. NTPC to identify and provide the sufficient space for all FGD facilities. 2) The allocated space is shown in future unit area NTPC to confirm that for phase-I same shall be used or not.	1. Bidder to refer Amended GLP being issued separately. 2. The space identified for Stage-II facilities cannot be used.
1049.			Layout Constraints & Space	BARH 3X660MW Allocated space: 1) 9x63 m right side of chimney 2) 25mx110m 3) 25mx284 m 4) 20mx48m 5) 20mx35m 6) 21mx15m 7) 131x650	1) In 9 m wide area not possible to use as width is very less. 2) NTPC to check and confirm that 25x284 m area in width wise is any possibility to get more width. 3) In layout allocated space is not sufficient for all FGD equipment's/buildings, facilities. NTPC may suggest additional space.	Available area is shown in amended GLP being issued separately. However, as per specification requirement, bidder is requested to visit site and make his own assessment.

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1050.				GADARWARA 2X800MW Allocated space: 1) Approx. 30mx110m-left side 2) Approx. 30mx110m-right side Layout Constraints & Space	1) Space available for Absorber with pump house, booster fan, wet stack only. 2) NTPC to identify & provide space for gypsum handling system, electrical building and lime stone buildings, lime handling building spaces to accommodate all FGD facilities. 3) In layout allocated space is not sufficient for all FGD equipment's/buildings, facilities. NTPC may suggest additional space.	Available area is shown in amended GLP being issued separately. However, as per specification requirement, bidder is requested to visit site and make his own assessment.
1051.				DARLIPALLI 2X800MW Allocated space: 1) Approx. 30mx110m-left side 2) Approx. 30mx110m-right side Layout Constraints & Space	1) Space available for Absorber with pump house, booster fan, wet stack only. 2) NTPC to identify & provide space for gypsum dewatering and handling system, electrical building and lime stone grinding buildings, lime handling building spaces to accommodate all FGD facilities. 3) We propose to use Left side	Available area is shown in amended GLP being issued separately. However, as per specification requirement, bidder is requested to visit site and make his own assessment. S.No 3,4 and 5: Bidder is requested to visit the site as per the terms of the specifications. Bidder to carry out his own assessment and locate the

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					area which is now allocated for SG contractor space. 4) We presume that NTPC has checked the feasibility of FGD facilities i.e. absorber is located near the raw water reservoir which will pollute the raw water reservoir. 5) In layout allocated space is not sufficient for all FGD equipment's/buildings, facilities. NTPC may suggest additional space.	equipment/systems accordingly.
1052.	Layout Constraints & Space			TANDA 2X660MW Allocated space: 1) 30.35mx68.9m left side of chimney 2) 30.35mx68.9m right side of chimney 3) Green belt area (71.9+197.31+82.18+90.1+79+65+52) total area.	1) Space available for Absorber with pump house, booster fan, wet stack only on both side chimney area. 2) Other FGD facilities possible to locate at the area shown near green belt area which is far way. Is it possible to take any space near by.	Available area is shown in amended GLP being issued separately. However, as per specification requirement, bidder is requested to visit site and make his own assessment.
1053.	Layout Constraints & Space			NABINAGAR 3X660MW Allocated space: 1) Approx. 152mx93m	1) Space available for Absorber with pump house, booster fan, wet stack, Lime grinding system, gypsum de-	Available area is shown in amended GLP being issued separately. However, as per specification requirement, bid-

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					watering buildings are possible. 2) Other areas like Lime handling system shed, gypsum handling shed, electrical building etc we are not having sufficient space to accommodate in the layout. We request you to kindly identify the space and provide. 3) In layout allocated space is not sufficient for all FGD equipment's/buildings, facilities. NTPC may suggest additional space.	der is requested to visit site and make his own assessment.
1054.	Sec.-VI, part-A	1.04.01	1 of 3	Normal make-up to ECW tank	Please provide us the location/co-ordinate of the tap off point (for each project separately) for our estimation & better under standing purpose. Tapping point shall be provided with a manual isolation valve, please confirm.	Corresponding header is available throughout the C-row and the bidder can take connection as per their convenient location.
1055.	Sec.-VI, part-A	1.04.02	1 of 3	Emergency make-up to ECW tank	Please provide us the location/co-ordinate of the tap off point (for each project separately) for our estimation & better under standing purpose.	Corresponding header is available throughout the C-row and the bidder can take connection as per their convenient location.

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					ter under standing purpose. Tapping point shall be provided with a manual isolation valve, please confirm.	
1056.	Sec.-VI, part-A	1.05.00	1 of 4	Process water	Please provide us the location/co-ordinate of the tap off point (for each project separately) for our estimation & bidder under standing purpose. Tapping point shall be provided with a manual isolation valve, please confirm.	Corresponding header is available throughout the C-row and the bidder can take connection as per their convenient location.
1057.	Sec.-VI, part-A	1.06.00	1 of 4	Gypsum wash water (Clarified water)	Please provide us the location/co-ordinate of the tap off point (for each project separately) for our estimation & bidder under standing purpose. Tapping point shall be provided with a manual isolation valve, please confirm.	Corresponding header is available throughout the C-row and the bidder can take connection as per their convenient location.
1058.	Sec.-VI, part-A	1.07.00	1 of 4	Potable water	Please provide us the location/co-ordinate of the tap off point (for each project separately) for our estimation & bidder under standing purpose.	Corresponding header is available throughout the C-row and the bidder can take connection as per their convenient location.

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					Tapping point shall be provided with a manual isolation valve, please confirm.	
1059.	Sec.-VI, part-A	1.08.00	1 of 4	Waste water	Please clarify whether HCSD mixing tank & FGD waste water collection tank are same. Please also provide us the location/co-ordinate of the waste water discharge point (for each project separately where zero discharge is not in Bidder's scope) for our estimation & better under standing purpose.	Specification requirement is clear. Bidder to comply with the specification requirements. Bidder shall decide the location based on its offered design.
1060.					Please provide us the Clarified Water Analysis and DM Water Analysis for NABINAGAR 3X660MW Power Plant as it is not legible from the TS. For others we will consider the same as mentioned in the TS for further designing of the system & no variation on the same during DE stage will be acceptable.	Bidder to refer the project specific details. The details asked seem to be quite legible for use. However, if required the Bidder may get the same from Address for communication as given in subject tender NIT.
1061.					Please provide us the desired effluent analysis to be considered.	WWTP is part of Flue Gas Desulphurisation system package.

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					ered for the design of WWTP for each plant. In the absence of above it is not possible from our end to design the WWTP.	As such, effluent analysis for design of WWTP shall be decided by the Bidder based on its offered system.
1062.					Please provide us the desired quality analysis of the recovered /treated water from WWTP for each plant separately & mention the parameters like suspended solids, Chlorides, Sulphate, Dissolve solids, PH range & approx. temperature etc. as applicable.	Refer above.
1063.	Sec.-VI, part-B	4.02.00 (vi)	18 of 24	Waste Water Functional Guarantees and Liquidated Damages	We understand that waste water treatment plant to be designed for average flow of 10 m3/hr to WWTP in 24 hrs period from each unit.	Technical specification requirement is clear. Bidder shall comply technical specification requirement. Bidder to refer amendment in this regard.
1064.	Sec.-VI, part-B	3.01.00 (H - 3)	15 of 32	Final treated water to FGD service storage tank	We understand that final treated water from FGD Waste Water Treatment plant shall be directly supplied from treatment tank to FGD service water tank & this distribution system of the treated water from FGD WWTP plant to FGD plant shall	Confirmed.

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					be under Bidder scope only. Please confirm. Also please inform us that which tank has been termed as treatment tank & FGD service water tank.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
1065.	Sec.-VI, part-B	3.01.00 (C - 3)	7 of 32	MOC of aeration device	Pease provide us the material of construction (corrosion resistant material) for FGD aeration device.	The aeration devices shall be constructed of suitable corrosion resistant material as per the proven practice of OEM which shall be decided during detailed engineering.
1066.	Sec.-VI, part-B	7.07.07	28 of 51	PH correction of waste water	Please provide us the PH range to be considered for the effluent/waste water to be discharged after neutralization by lime dosing.	Specification requirement is clear under the referred cl.no. 7.07.07 . Bidder shall comply with the specification requirements.
1067.				Material size distribution for limestone	Please provide sieve analysis report for the Lime stone received from Mine.	Please refer Clause 10.06.00 (Page 22 of 26), sub-section V (Salient Design Data & Sizing). The limestone delivered to power station shall be of size 250 mm and below. However, occasionally 1-2% coal of 400

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						mm lump size may also be encountered.
1068.	Sec-IV-Part A	10.07.00		No of crusher	As per tender bidder has option for selection of 2X50% or 1X100% crusher. However, as per clause 3.3.0 it is stated that each stream will have dedicated 2 nos. of grizzly feeders and 2 nos. of crusher means 2 x 50%. We understand that in case of 1 x 100%, 1 no. grizzly feeder and 1 no. crusher will be considered for each dedicated stream. Please confirm.	Noted. Suitable amendment shall be issued.
1069.	Sec-IV-Part A	2.01.10		Trippler/ flow diverter plough	As per feasibility of layout either Flow diverter or tripper will be considered on each feeding conveyor for storing the crushed lime stone to the covered storage area	Noted.
1070.	Sec-IV-Part A	2.01.19		Elevator	Please indicate elevator capacity for the Limestone crusher house	One (1) number conventional enclosure type passenger cum goods elevator having capacity of 16 persons (1088 kg) complying to IS:14665 (latest edition) with drives, all electrical, mechanical, civil, structural & associated foundation works, acces-

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						sories and electrical to serve various floors of lime stone crusher house. Staircase access for machine room shall also be provided by the bidder.
1071.	Sec-IV-Part A	4.1.2		Idler Diameter	For Lower capacity of belt Conveyor we propose to go with 127mm dia idler for carrying & return side & impact idler with 114.3mm pipe diameter & with 25mm rubber thickness. Bearing diameter for carrying & return idler shall be 25mm & for impact idler bearing diameter shall be 30mm. Please confirm	Technical Specifications is clear. Bidder shall comply technical specifications.
1072.	Sec-IV-Part B	4.1.7		Tunnel Height	In tender specification, tunnel height is not specified. We propose to consider the tunnel height as 3200 mm. Please confirm	Tunnel height is to be considered as 3500MM.
1073.				Conveyor design	Please specify the % loading of the conveyor to be considered for selecting the Belt width	Bidder to refer Amendment regarding selection of belt width.
1074.				Vibration isolation system	Please clarify whether VIS is to be considered for lime stone crusher.	Vibration Isolation System is to be considered for lime stone crusher.
1075.				Modification in Existing Coal Conveyor	NTPC to note that during modifications, conveyor drive rating	Technical Specifications are clear. All necessary modifications

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					for conveyor feeding to crushers may get change or drive margin considered may get reduced. Please confirm the scope of work in case of drive components gets changed.	tions involving Mechanical, Electrical, C&I, Civil and Structural works in the existing CHP for taking feed to new limestone path shall be in the scope of the bidder. Pls refer Cl.2.01.01 (page 2 of 6), Sub section III-A6, Section VI, Part – A of the technical specification.
1076.				Existing coal conveyor GA feeding to crusher house for all FGDs	Please provide existing coal conveyor profile/GA drawing and gallery cross section , which is feeding to coal crusher house for modification required in the existing system for tapping of limestone conveyor to the lime stone crusher house.	Noted.
1077.				Layout for Darlipalli -layout drg no. 9549-999-POC-F-001	There is space constraint for limestone crusher house and storage. We propose to reduce the stockpile for coal adjacent to BC 3A/3B thereby we can provide limestone crusher house and storage. Further crushed limestone will be fed to existing coal conveyor BC4A/4B for onward transportation through coal circuit con-	Existing Coal Stockpile area has been planned considering requirement of existing plant and, therefore, the area marked for the same shall not be proposed by the bidder for FGD facilities like limestone crusher house and storage. The detailed scheme for limestone conveying shall be dis-

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					veyor up to TP-11.	cussed with successful bidder during detailed engineering.
1078.				Layout for Gadarwara-layout drg no. 9572-999-POC-F-001	There is space constraint for limestone crusher house and storage. We propose to reduce the stockpile for coal adjacent to BC 2A/2B thereby we can provide limestone crusher house and storage. Further crushed limestone will be fed to existing coal conveyer BC4A/4B for onward transportation through coal circuit conveyer up to TP-10.	Existing Coal Stockpile area has been planned considering requirement of existing plant and, therefore, the area marked for the same shall not be proposed by the bidder for FGD facilities like limestone crusher house and storage. The detailed scheme for limestone conveying shall be discussed with successful bidder during detailed engineering.
1079.				Alternate proposal for lime stone transportation	Wherever, limestone cannot be transported through Belt Conveyer to day bin silo at FGD area due to layout constraint, Bidder propose for limestone grinding system near lime stone crusher house & slurry shall be transported up to absorber in FGD area through slurry piping.	The detailed scheme for limestone transportation shall be discussed with successful bidder during detailed engineering.
1080.	SUB SECTION –I-M4	2.00.00	91	Hydrant system shall consists of piping, hydrant valve...	It is presume that, fire water with suitable pressure (8 Kg/cm2) shall be made available	Bidder understanding is correct.

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1081.	SUB SECTION –I-M4	-	91	-	by Employer at T.O.P. No fire water pump is envisaged by bidder. Please confirm. It is presume that, fire protection system shall consists of hydrant system, HVM & MVW Spray system and Fire extinguisher. No gas based fire protection system, foam system is considered by bidder. Please confirm.	Bidder understanding is correct.
1082.	SUB SECTION –I-M4	3.01.00	91	Spray system	It is presume that, spray water shall be tapped of from hydrant network. Hence, no spray pump is required to be considered. Please confirm.	Bidder to refer relevant amendment in this regard.
1083.	SUB SECTION –I-M5	2.02.00	1 of 16	The secondary circulating water system shall receive water through tapping from CW blow down from the CW pumps Discharge header...	We understand that for all the eleven (11) packages, the water for secondary side (ACW side) of PHE shall be tapped from the CW blowdown. And which shall be tapped from the CW pump Discharge header. Please confirm	Bidder's understanding is correct.
1084.	SUB SECTION –I-M5	2.02.00	2 of 16	 The Discharge secondary water from PHEs shall be used as process water for FGD system.	No cooling tower is considered for cooling of PHE secondary outlet (hot) water. Hot water from secondary side of PHE	Bidder's understanding is correct

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					shall be directly used for FGD process. Please confirm.	
1085.	SUB SECTION -I-M5	2.05.00	2 of 16	To prevent fouling on the secondary cooling side of the PHE, Self-cleaning type filters (2x100%) shall be provided by the bidder on secondary cooling water inlet header to the PHE.	We are considering 2x100 % Simplex type self-cleaning filters at common PHE supply header. Please confirm.	Bidder shall comply the specification requirement.
1086.	Part B/Section-VI/Sub sectionI-M2	2.01.00	1 of 26	The areas to be air conditioned shall be as follows:	Requested to provide design indoor condition for air conditioning rooms.	For design indoor condition of Air-conditioning system, Bidder to refer SI no.3 of Clause no.7.01.00,Page no. 11 of 26 Sub-section-V, Part-A of Technical specification, Section- VI.
1087.	Part B/Section-VI/Sub sectionI-M2	2.01.00	1 of 26	The areas to be air conditioned shall be as follows:	Requested to provide design outdoor condition for selection of air conditioning systems.	Bidder to refer SI no.1 , Clause no.7.01.00 Salient Design Data ,Page no. 11 of 26 Sub-section-V Part-A of Technical specification Section VI.
1088.	Part B/Section-VI/Sub sectionI-M2	2.01.00 / (b)	1 of 26	Cassette and Hiwall air conditioners for other auxiliary control room/control room buildings...	Requested to clarify whether 100% redundancy is required for Cassette type Unit. Hiwall AC units.	Bidder to refer 7.02.01 (b) Page no. 13 of 26 Salient Design Data, Sub-section-V, Part-A of Technical specification, Section VI.
1089.	Part B/Section-VI/Sub sectionI-M2	2.01.00 / (b)	1 of 26	Cassette and Hiwall air conditioners for other auxiliary control room/control room buildings...	Requested to clarify whether Hiwall AC units will be 3 star or 5 star rating.	Bidder to refer Clause 1.00.00 (d), page 1 of 4 ,Sub Section III-A2, Part-A of Technical specification, Section VI.

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1090.	Part VI/Sub section I-M2	2.01.00 / (b)	1 of 26	Cassette and Hiwall air conditioners for other auxiliary control room/control room buildings...	Requested to clarify whether fresh air is required to be provided for cassette type units by providing separate fan and ducting.	Bidder shall comply with spec requirements.
1091.	Part VI/Sub section I-M2	2.01.00 / (b)	1 of 26	Cassette and Hiwall air conditioners for other auxiliary control room/control room buildings...	Requested to note that humidity control will not be possible for areas with cassette type or Hiwall AC units.	Noted
1092.	Part VI/Sub section I-M2	3.01.00 / i	1 of 26	Unitary Air Filtration (UAF) units of min capacity 75000 cmh/hr	Requested to confirm that equipment heat dissipation loads need not be considered for ventilation areas with UAF unit. Selection shall be as per specification only.	Bidder to refer relevant amendment in this regard.
1093.	Part VI/Sub section I-M2	3.01.00 / i	1 of 26	Unitary Air Filtration (UAF) units of min capacity 75000 cmh/hr	Requested to confirm whether any redundancy to be provided for UAF units.	Bidder to refer relevant amendment in this regard.
1094.	Part VI/Sub section I-M2	3.01.00 / i	1 of 26	Unitary Air Filtration (UAF) units of min capacity 75000 cmh/hr	Requested to clarify whether UAF unit to be selected for 3 deg C or 5 deg C above ambient design DBT inside ventilated room.	For evaporative cooling, Bidder to refer CI No 7.03.00, (2a), Sub-section-V, Part A of technical specification, Section VI.
1095.	Part VI/Sub section I-M2	3.01.00 / i	1 of 26	Unitary Air Filtration (UAF) units of min capacity 75000 cmh/hr	Requested to clarify whether makeup water for UAF unit to be arranged by contractor or NTPC shall provide the same.	Provisions of Technical specification are clear. Bidder shall comply with the same.
1096.	Part VI/Sub section I-M2	3.01.00 / i	1 of 26	Mechanical ventilation (using roof	Requested to provide air change	Bidder to refer CI No 7.03.00 ,

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	VI/Sub section-I-M2	/ ii		extractors/ supply	per hour to be considered for Grinding system building, Gypsum dewatering building, recirculation pump and oxidation blower/ compressor building as well as other areas such as toilets.	Sub-Section-V, Page no. 13 of 26, Sub-section-V, Part-A, of Technical specification, Section VI.
1097.	Section VI, Part B, Sub section-IV-D	17.08	35 of 69	For design of liquid retaining structures, IS : 3370 (Part - I to IV) (latest) shall be followed. Face of the structure in contact with liquid shall be designed as un - cracked section.	As per latest code of IS : 3370(Part 2): 2009, Clause 4.4.1.2.b, surfaces of liquid retaining structures shall be designed for 0.2mm crack width as per limit state design. Please confirm.	All RCC liquid retaining structures shall be designed by working stress method as per clause no. 4.5 of IS:3370 (Part-2):2009, as per technical specification.
1098.	Section VI, Part B, Sub section-IV-D			Please provide existing soil report with borehole log data nearby the proposed site of the project for reference.		Bidder may refer Project information chapter furnished in Technical specification. Further, Bidder may also refer Amendment for the Borelog data of Darlipalli, Meja and Solapur.
1099.	Section VI, Part B, Sub section-IV-D			Please provide topographical survey drawing nearby the proposed site of the project for reference.		Topographical survey drawing are furnished with tender document.
1100.	Section VI, Part B, Sub section-IV-D	3.01	3 of 69	No painting, galvanization shall be provided in gratings	The two clauses appear contradicting each other please confirm whether gratings shall be hot dip galvanized or not.	All gratings shall be hot dip galvanized as per technical specifications except for Truck hopper gratings which shall be provided two coats of Red oxide
1101.	Section VI, Part B,		8 of 69	All gratings shall be hot galvanized	The two clauses appear contradictory	

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	Sub section-IV-D			at the rate of 610 g. sq.m after surface preparation by means of blast cleaning/ acid pickling.	dicting each other please confirm whether gratings shall be hot dip galvanized or not.	primer immediately after fabrication. Technical specification requirement is clear in this regard.
1102.	Section VI, Part B, Sub section-IV-D	3.01	3 of 69	50 mm thick PCC shall be provided under the raft, followed by polymer modified coating in two layers as per manufacture specs. 50mm thick PCC shall then be laid over polymer modified cementitious coating before laying raft.	Please confirm whether total of two layers or only single layer of 50mm thick PCC is required to be provided below raft, in addition to lean concrete and 2 layers of polymer modified coatings.	Two Layers of 50mm thick pcc shall be provided over lean concrete , one before laying of polymer modified coating(in two layers) and other after laying polymer modified coating.
1103.	Part A – Sub Section III C / C&I System	02.03.0 2	81/209	CEMS Analyzer Connectivity provision for bidirectional communication with Employer's cloud server . Necessary hardware & software shall be provided by contractor.	Please specify the Hardware & Software details required for this communication establishment.	Specification requirement is clear. Bidder shall comply with the specification requirement.
1104.	Part A – Sub Section III C / C&I System	04.00.0 0.D	83/209	I&C Cable Cable required for interfacing PLC control system with employers DDCMIS	We assume 50 nos hardware signals to be interfaced from FGD PLC to employer DDCMIS. Please confirm.	Bidder's understanding is not correct. Bidder to refer clause 9.01.00, PART-A Sub Section-IIIIC, wherein the minimum number of hardwired signal exchange per unit is mentioned as DI – 80, DO – 80, AI – 20 and AO – 20. Bidder shall comply with the specification requirement.
1105.	Part A – Sub Section	04.00.0	83/209	I&C Cable	All these CEMS signals are terminated.	Bidder's proposal is not acceptable.

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	III C / C&I System	0.E		Cable required for interfacing CEMS signal with employers DDCMIS	minating at FGD PLC. It shall be communicated to employer DDCMIS from FGD PLC as soft signals. Please accept.	ceptable. CEMS signals shall be connected to employer's DDCMIS through hardwired signal exchange.
1106.	Part A – Sub Section III C / C&I System	08.00.00	85/209	Tools & tackles Contractor shall provide new set of all special tools & tackles.	Please provide us the list. We shall comply to that.	The list of Tools and Tackles shall be discussed and decided during detailed engineering.
1107.	Part A – Sub Section III C / C&I System	09.01.00	85/209	PLC Remote Input output (RIO) for PLC per unit, placed in employer CCR.	We shall make use of common Employer's signal earthing/grounding, ventilation & its Air conditioning system for the placing of RIO device. Please confirm.	Bidder's understanding is correct. However, cabling from RIO panel placed in CER to employer's earth riser shall be in contractor's scope of supply.
1108.	Part A – Sub Section III C / C&I System			Vibration Measurement Vibration measuring & monitoring for drives	As per FGD spec, we are considering vibration monitoring for Crusher only. We propose the use of velocity transducers with inbuilt signal conditioner for direct measurement of vibration. Please accept	It is clarified that Vibration Monitoring System (VMS) is not the scope of the bidder. However, vibration measurement is envisaged for each vibration measurement point as indicated in a) Tender drawing "0011-109-POM-A-001" b) PART A, Clause 23.01.00 of sub section III-A1 c) PART-A, Clause 2.01.06 of sub section III-A5.

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						It is further clarified that as per clause 1.07.00 of sub section III-C2 PART B of technical specification, vibration measuring instrumentation shall be as per the standard and proven practice of the bidder. Vibration measuring instrumentation output (4-20mA) shall be connected to FGD control system instead of vibration monitoring system.
1109.	Part A - SUB-SECTION-III-C (C&I) MEASURING INSTRUMENTS	2.01.00	79/209	Analyzers Density analyzer - Specification	The specification for density analyzers specifies the working principle as nucleonic density meter. We propose the use of any other principle of density measurement device. Please accept	Bidder's understanding is not correct. Bidder to refer clause 2.01.00, PART-A Sub Section-III-C, wherein it is mentioned that density meter (Coriolis type) shall be in the scope of the bidder. In case the bidder proposes other type of density meter as per the bidder standard and proven practice, the same shall also be acceptable except Nucleonic type density meter. Bidder shall comply with the specification requirement.
1110.	Part B - Sub Section-	5.00.00	45/103	LIE/LIR	We shall make all possible effort	Bidder's proposal is noted.

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	III-C3 / Process Connection & Piping			All transmitters & switches shall be suitably grouped together & mounted inside.	to group transmitters & switches. However for odd location & single equipment, transmitter with canopy shall be installed for ease of access & suitable for measurement. Please accept.	
1111.	Part B - Sub Section-III-C3 / Process Connection & Piping	5.01.00	46/103	Temp Tx Enclosure / rack for temperature transmitter	We shall make all possible effort to group transmitters. However, for odd locations / single instrument, transmitter with canopy shall be installed for ease of access & suitable for measurement. Please accept.	Bidder's proposal is noted.
1112.	Part B - Sub Section-III-C5 / PLC Based Control System	1.05.00	63/103	PLC System ON/OFF control, indication, annunciation of incomers and bus coupler (even if they are not in the scope of the contractor) are also to be performed from Contractor's Control System for each of the plant auxiliary system as applicable.	We shall extend to the respective feeder. Further interfacing will be carried out by employer. Please accept.	Bidder's proposal is not acceptable. Bidder shall comply with the specification requirement.
1113.	Part B - Sub Section-III-C5 / PLC Based Control System	05.03.09	75/103	PLC System For inching type of drive, position transmitter power supply shall be	We propose the use of loop powered position transmitter, which doesn't require additional	Bidder's proposal is also acceptable subject to the compliance of other specification re-

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				provided.	power supply. Please accept.	quirements.
1114.	Part B – Section VI, Sub Section-I-M1	4.05.00 (d,e)	12/51	Adequate numbers of duplex Pt-RTD (100 ohm at 0 degree Celsius) and temperature indicator shall be provided for each bearing. Local as well as remote monitoring features shall be provided. For mounting of vibration pads/pickups, flat surfaces shall be provided both in X and Y directions, by the Contractor on the bearing housing.	We understand that the mentioned clauses are applicable for HT motors only. Kindly confirm.	Bidder understanding is not correct. The referred clause is applicable for booster fans. Bidder shall comply with the specification requirement.
1115.	Part B – Section VI, Sub Section-I-M1	6.02.03	21/51	Each Silo shall be provided with sufficient no. of level transmitters.	We propose 1 number ultrasonic level transmitter per silo. Kindly accept.	Bidder's proposal is not acceptable. Bidder to provide minimum 02 no. of Level transmitters per silo. Amendment shall be issued in this regard.
1116.	Part B – Section VI, Sub Section-I-M1	7.07.09	29/51	Contractor shall provide.....level switches, air relief devices, etc.	We propose 1 number ultrasonic level transmitter per silo. Kindly accept.	Bidder's proposal is not acceptable. Bidder to provide minimum 02 no. of Level transmitters per silo. Amendment shall be issued in this regard.

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1117.	Part B – Section VI, Sub Section-I-M4	5.03.07 5.03.16	3/18	The coverage or the zone of protection afforded by the detector and recommended height of mounting shall be furnished by the Bidder. The bidder shall furnish the test certificate in support of this.	The spacing and height of the detectors shall be as per IS 2189. Kindly accept.	Noted.
1118.	Part B – Section VI, Sub Section-I-M4	5.08.03	6/18	FGD and ZLD (as provided) Fire alarm system shall be provided with necessary interface hardware and software for communicating fire alarms from this fire alarm panel to the main plant fire alarm control panel through potential free contacts.	We propose one fire alarm panel at FGD control room only. Kindly accept the same.	The main plant fire alarm control panel is in Employer's scope. Necessary hardware and software for communicating fire alarms from the bidder's fire alarm panel (for FGD and ZLD area) to the employer's fire alarm panel is in the scope of the bidder.
1119.	Part B – Section VI, Sub Section-I-M4	5.06.00 (d)	6/18	Each detector in a loop shall have short circuit isolator suitable for style-7 wiring as per NFPA-72.	As specified in Clause 5.09.08, We shall consider class A wiring for fire detection system. Kindly accept the same.	Bidder's understanding is correct.
1120.	Part B – Section VI, Sub Section-I-M6	4.7.4	11/73	The tripper shall run on rails (90 lbs/yard) with double flanged wheels. Rails for tripper travel shall be mounted on supporting structure of respective conveyors. Suitable system having encoders for monitoring position of	We understand that DDCMIS shall be read as FGD PLC. Please confirm. It is noticed that the DDCMIS has been mentioned time and again in the specification for	Bidder's understanding is correct.

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				tripper in DDCMIS shall be provided.	FGD system, we understand that the same refers to FGD PLC. Please confirm.	
1121.	Part B – Section VI, Sub Section-I-M6	4.01.00 4.03.01 4.08.00	60/73 61/73 67/73	Overall, operation of the following equipment of Lime Handling Plant shall be controlled from the main FGD control room through FGD DDCMIS being provided by the Contractor. The lime handling plant being provided by bidder envisages control of complete lime handling system including facilities under subject package by DDCMIS. DDCMIS/Control desk shall be provided with....	understand that DDCMIS shall be read as FGD PLC. Please confirm. It is noticed that the DDCMIS has been mentioned time and again in the specification for FGD system, we understand that the same refers to FGD PLC. Please confirm.	Bidder's understanding is correct.
1122.	Part B – Section VI, Sub Section-I-M7	3.02.03 (8)	20/32	Tanks and access hatches shall be designed in accordance with API Code 650. Remote level indicators or alarm shall be provided for all tanks.	We understand that remote level indicator shall be mounted close to the tank for local indication. Please confirm.	Bidder's query is not clear. Bidder to follow specification requirements.
1123.	Part-A/Section – VI/ Sub-section – IIIB	Cl.1.08.00/ point No. 2	2 of 6	In case of non-availability of space in employer's trestle, contractor shall make necessary arrangements for cable tray erection, cable lay-	We understand that new cable tray shall be erected on employer's cable trestle. We do not envisage new cable trestle	Bidder shall comply with technical specification requirement clause no: - 1.08.00.2.

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				ing.	for the cables to be laid from employer's board. Kindly confirm.	
1124.	Part-A/Section – VI/ Sub-section – IIIB	Cl.1.08. 00/ point No. 2	2 of 6	In case of non-availability of space in employer's trestle, contractor shall make necessary arrangements for cable tray erection, cable laying.	We request client to provide the existing cable trestle and section drawing for all the projects.	Bidder shall comply with technical specification requirement clause no: - 1.08.00.2. However bidder may visit the project in order to get itself acquainted with existing electrical of plant. GLP of respective plants has already been attached.
1125.	Part-A/Section – VI/ Sub-section – IIIB	Cl.1.09. 00	3 of 6	Complete lighting system for internal and external areas of plants, buildings, chimney and equipment's in the bidder's scope.	We do not envisage street lighting for the existing roads. Illumination for approach roads of FGD facilities are only considered in bidder's scope of work. Kindly confirm.	Bidder to provide complete lighting for roads under his scope
1126.	Part-A/Section – VI/ Sub-section – IIIB	Cl.1.09. 00	3 of 6	Lighting fixtures complete with lamps, ...chimney aviation light	We understand that aviation lights for existing chimney is not in bidder's scope of work. Kindly confirm.	Bidder understanding is correct.
1127.	Part-A/Section – VI/ Sub-section – IIIB	Cl.1.10. 00	4 of 6	Complete below ground earth mat and above ground equipment earthing system	We do envisage peripheral below ground earth mat for FGD area in our scope of work. However, we do not verify the	Bidder shall comply with requirement of technical specifications clause no:- 5.01.00

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					step and touch potential voltage in our scope of work. Kindly confirm.	
1128.	Part-A/Section – VI/ Sub-section – IIIB	Cl.1.12.00	4 of 6	To meet the construction power requirement of FGD and associated systems, the employer shall provide two number 415V feeders in LT switchgears.	We understand that the construction power is provided free of cost. Also request client to provide the location of two numbers of 415V feeders for all the projects. Kindly confirm and clarify the details	Bidder's understanding is not correct. The referred clause no. 1.12.0 of Tech. Specifications is amply clear. Locations shall be identified during FGD Contract execution stage.
1129.	Section- VI/ Electrical Single Line diagram for FGD system		53 of 53	Feeder for AHP/CHP HT transformer	We request client to provide the following details for all the projects: Existing 11kV feeder details feeding to AHP/CHP transformer Rating and location of AHP/CHP transformer Cable routing layout from 11kV station switchgear to AHP/CHP transformer.	Details for feeders proposed to be used for FGD system have included in AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).

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1130.	Section – VI/ section – II-E	CL.2.04. 00	4 of 7	These relays shall be integrated with employer's switchgear SCADA through Ethernet switches (to be supplied by employer) mounted on each switchgear.	In line with referred clause, we understand that client shall supply Ethernet switches to be mounted on bidder supplied switchgear. Kindly confirm.	This clause is deleted. Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI)
1131.	Section – VI/ section – II-E1	CL.2.07. 00	5 of 7	The earthing system for plant shall be designed for life for fault current of 50 kA for 1 sec.	We do envisage to extend the existing below ground earthing mat in our scope of work. We do not submit any design calculations. Kindly confirm.	Bidder shall comply with requirement of technical specifications clause no:- 5.01.00
1132.	Section – VI/ section – II-E4	CL.2.00. 00	1 of 6		We understand that LT power cables of sizes 95 sq.mm and below shall be laid in two layers and above 95 sq.mm shall be laid in single layer is acceptable to client. Kindly confirm.	The same shall be decided during detailed engg.
1133.	Section – VI/ section – II-E6	CL.2.01. 04	2 of 69	No sub zero level cable vault/trenches shall be provided below control buildings/switchgear rooms in main plant.	In line with CL. 2.01.04, we understand that cable trenches are acceptable for client in FGD area.	Bidder understanding is correct.

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					Kindly confirm.	
1134.	Section – VI/ Sub-section – II-E6	CL.2.01.05	2 of 69	Cable vault		No query asked.
1135.	Section – VI/ Sub-section – II-E7	CL.2.16.01, c)	4 of 6	Short circuit withstand capability	We do envisage duration of short circuit as 0.2 sec for 11kV tie cable from Employer 11kV station switchgear to 11kV FGD switchgear. Kindly confirm.	Requirement of Tech Specification Part B/ Section-VI sub section II – E1 clause 7.00.00 to be complied.
1136.	Section – VI/ Sub-section – II-E12	CL.1.01.00	1 of 31	Outdoor transformer	We request client to specify the energy efficiency level of 11/0.433kV service transformer.	Bidder shall comply with specification clause no. 2.00.00.f of Part B/ Section-VI sub section II – E12
1137.	Section – VI/ Sub-section – II-E15	CL.3.02.02	4 of 16	Emergency AC lighting	We do envisage 20% of total fixtures of particular area to be fed from emergency Ac lighting. Kindly confirm.	Bidder to refer necessary amendment in this regard.
1138.	Section – VI/ Sub-section – II-E15	Annexure-A, point d)	15 of 16	Battery room : Totally enclosed corrosion proof LED luminaire	We do envisage conventional fixtures for Dc lighting, hazardous area, high mast (if applicable) and aviation lighting. Kindly confirm.	Technical specifications are clear. Bidder shall comply with technical specification requirement.
1139.	Soil resistivity				We request client to provide	Bidder to refer necessary

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					the soil resistivity value for all the projects.	amendment in this regard.
1140.	Earthing Layout				We request client to provide the existing earthing layout for all the projects.	Shall be provided during detail engineering.
1141.	General				We request client to specify the route length from FGD system to 11/3.3kV existing CHP/AHP transformer.	Refer amended tender SLD & GLP.
1142.	General				Request NTPC to provide auto-cad drawing of 11 projects plot plans.	Only PDF provided.
1143.	General				Request NTPC to provide duct elevation drawing from ID fan to chimney for all 11 projects.	Same will be discussed with the successful bidder during the detail engg. stage.

Sr. No.	Document No	Sub Section	Page No	Clause No.	Subject	Clarifications requested	NTPC Clarifications
1144.	Technical Specification Section-VI,	Sub Section -I	3 of 19	1.03.06	Wet stack	Please advise whether we can consider chimney mounted on absorber as a integral chimney.	Bidder shall comply with the requirements of Technical Specifications.

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1145.	Part-A, BID doc no : CS-0011-109-(1A)2	Sub Section -III-A5	2 of 6	2.01.01	LHP	Client to confirm plant specific limestone unloading by truck or by wagon to design system accordingly.	Technical Specifications is clear. Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes. Road unloading facility shall be provided for all the plants under this package. Wherever feasible, railway unloading shall also be provided using existing Wagon Tippler / Track Hopper as detailed out in the Technical Specifications.
1146.		Sub Section -III-A5	-	2.00.00 & 3.00.00	LHP & GHP	Client to earmark space in layout for both these facilities	Space available for FGD and associated system is marked in the General Layout Plan drawings attached with the Technical Specifications. Bidder has to propose the layout for LHP & GHP to cater the requirement of FGD plant based on the layout of FGD system and existing facilities.

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1147.		Sub Section -III-A5	6 of 6	3.03.00	Sump pump	Please clarify quantity (Word and number not matching)	The number of sump pump shall be read as four (4). Necessary Amendment shall be issued.
1148.		Sub Section -V	3 of 26	2.00.00 & 3.00.00	Salient design data	Meja-I appears in both design criterias of mentioned clauses, please clarify which design data to be referred for Meja-I	Refer necessary amendment in this regard.
1149.		Sub Section -V	08 of 26	5.01.00	Wet Chimney	Whether alternate material like "FRP" can be proposed	Bidder shall comply with the requirements of Technical Specifications under the referred cl.no. 5.01.00.
1150.		Sub Section -V	10 of 26	6.00.00	Limestone data	Size of raw limestone received at site to be provided	Please refer Clause 10.06.00 (Page 22 of 26), sub-section V (Salient Design Data & Sizing). The limestone delivered to power station shall be of size 250 mm and below. However, occasionally 1-2% coal of 400 mm lump size may also be encountered.
1151.		Sub Section -VI	18 of 24	4.02.00 (vi)	Waste water	The quantity of waste water may vary plant to plant based on various conditions, hence cap on waste water discharge shall be eased.	Bidder shall comply with the requirements of Technical Specifications.

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1152.		Part-B, Sub Section -I-M1	7 of 51	3.03.09	Guillotine Damper	Is this pneumatic or motorised	Motorized.
1153.		Part-B, Sub Section -I-M1	8 of 51	4.01.01	Booster fan	Referring to point no 5 above, please reconfirm the design flow of fan for Solapur & Meja	Specification requirement is clear. Bidder shall comply with the specification requirements
1154.		Part-B, Sub Section -I-M1	10 of 51	4.02.00	Booster fan	Please clarify does the margins means equipment selection at Flow x 1.2 @ Head x 1.44	Specification requirement is clear. Bidder shall comply with the specification requirements at referred cl.no. 4.02.00.
1155.		Part-B, Sub Section -I-M1	24 of 51	6.07.03	Slurry pipes	Should FRP pipes be considered	Specification requirement is clear. Bidder shall comply with the specification requirements at referred cl.no. 6.07.03.
1156.		Part-B, Sub Section -I-M1	26 of 51	7.04.02	Filter cloth	Since VBF suppliers are guaranting only 4000 hrs, may be reviewed.	Specification requirement is clear. Bidder shall comply with the specification requirements at referred cl.no. 7.04.02.
1157.		Part-B, Sub Section -I-M1	27 of 51	7.05.06	Plate valve	Please elaborate the need	Specification requirement is clear. Bidder shall comply with the specification requirements at referred cl.no. 7.05.06.

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1158.		Part-B, Sub Section -I-M1	33 of 51	12.01.00	Slurry pipes	Should all pipes be considered as FRP	Specification requirement is clear. Bidder shall comply with the specification requirements at referred cl.no. 12.01.00.
1159.		Part-B, Sub Section -I-M6	2 of 73	3.2.0	LHP	Coal may contaminate limestone, recommend to use truck systems.	Noted.
1160.		Part-B, Sub Section -I-M6	3 of 73	3.3.0	LHP	Please confirm feed size of limestone	Please refer Clause 10.06.00 (Page 22 of 26), sub-section V (Salient Design Data & Sizing). The limestone delivered to power station shall be of size 250 mm and below. However, occasionally 1-2% coal of 400 mm lump size may also be encountered.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	NTPC Clarifications
1161.	Part-A-Sub Section-II-A6	Clause no.7.08- Page no.19	Foundation System and Geotechnical Data- Type of Foundation system to be adopted- Open Foundation system.	The foundation design shall be based on final recommendations of geotechnical investigation report approved by Client during execution. Provision shall be made for appropriate compensation if any major variation in the soil data/ sub-soil conditions if identified.	Bidder may refer Cl. No. 7.00.03. If bidder feels, data provided is not adequate, he may carry out geotechnical investigation for bidding purpose. Further, Bidder shall comply the provisions of Technical Specification.
1162.	Sub-Section-IVD -CIVIL WORKS	Clause no.12.00	RCC Roads & RCC Drains	Bidder understands that only approach roads along with drains on both sides shall be provided from the new structures of the proposed FGD. The main plant roads and drains shall be in the scope of the client. Please confirm.	Refer Scope of work. Refer clause 2.00.00 Section-VI, Part-A of technical specification.
1163.	Sub-Section-IVD -CIVIL WORKS	Clause no.13.00	Gate Along Boundary Wall	Bidder understands that any works for construction of gate along boundary wall is excluded from the bidders scope of work.	Refer Scope of work. Refer clause 2.00.00 Section-VI, Part-A of technical specification.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	NTPC Clarifications
1164.	Sub-Section- IVD -CIVIL WORKS	Clause no.4.01	Contractors scope shall include construction of necessary culverts below railway lines/ roads as per the railway/IRC standards and shall take approvals of railway culverts from the concerned railway authorities.	Bidder has considered RCC hume pipe culverts only below the approach roads in the scope of works for this package. Bidder has excluded the construction of culverts below railway lines and taking their approvals from necessary railway authorities. Bidder request client to kindly confirm.	Bidder shall comply with technical specification requirement.
1165.	Sub-Section- IVD -CIVIL WORKS	Clause no.14.00	The Storm Water drainage for any area under consideration shall be taken in to account the finished grade levels of the area.	Bidder has considered only the drains along the approach roads and garland drains around the proposed structures. These drains shall be connected to the nearest main plant drains with proper slopes. Please confirm.	Bidder's understanding is correct.
1166.	Sub-Section- IVD -CIVIL WORKS	Clause no.25.02	Excavations in hard rock shall be carried by Blasting if required. The contractor shall obtain license from the competent authorities for undertaking blasting works.	Bidder request client to take necessary statutory permissions required for Blasting from the concern authorities. Bidder has excluded these from their scope of work.	Bidder shall comply with technical specification requirement.
1167.	Sub Section I-M1	Clause 5.06.06	Mist eliminator	Whether bidder can propose roof type ME with PP material	Bidder can propose roof type Mist Eliminators with the material specified in the Technical Specification.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	NTPC Clarifications
1168.	Sub Section I-M1	Clause 5.03.02	Oxidation Blower	The stoichiometric ratio of 2.5 was mostly used in the past for grid type of oxidation, now a day with new spargers, lower SR typically below 2 are in use, can we consider lower SR. Also whether we can offer 3 blowers (2W+1S) common for two units	Bidder shall comply with the requirements of Technical Specifications.

S.No	Vol No/Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



S.No	Vol No/Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
1	SECTION -VI TECHNICAL SPECIFICATION, Clause: 3.14.03	1	The wind shield shall be designed for vertical loading, cross wind loading, seismic loading, circumferential wind loading, thermal gradients etc. The load calculation and load combinations shall be as detailed in IS 4998 (Part 1) : 1992. The wind shield shall be analysed for cases with and without flue liner loads.	NTPC to clarify wind shield design shall be performed as per IS 4998 (Part 1) : 1992 or IS 4998 (Part 1) : 2015.	Bidder shall comply to the requirements of technical specification.
2	SECTION -VI TECHNICAL SPECIFICATION, Clause: 3.14.03	2	The effect of the openings/cut-outs in the chimney shell shall be duly considered in the design of the windshield. The minimum thickness of shell shall not be less than 500mm.	NTPC to confirm the minimum thickness of shell shall be as per IS 4998(Part-1) or 500mm.	Bidder shall comply to the requirements of technical specification.
3	SECTION -VI TECHNICAL SPECIFICATION, Clause: 3.14.01	10		As there is no clarity regarding mini shell above roof level, it is proposed to extend the steel flu can above chimney roof with 2 mm thick Titanium / C-276 sheet over insulation as per clause 3.02.07 of SUB-SECTION-I-M1(Part-B) on external surface of the steel flu extended above roof. No RCC mini shell considered. NTPC to confirm.	Flue liner shall be provided as per the requirements of technical Specification. There is no specific requirement of RCC mini-shell.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



S.No	Vol No/Clause No	Page No.	Description of Bid Document	Queries/Suggestions	NTPC Clarifications
4	Sr no 4 of the Table under clause 5.01.00 & discription of the clause of Sub section -V of Section VI- Part A	8	Wet Stack shall be designed as per guide lines of EPRI Revised Wet Stack Design Guide. Flue Gas Velocity in Stack < 18 m/s	Table 2.1 of EPRI Wet Stack Design Guide recommends maximum flue gas velocity for Alloy Liners as 16.8 m/s against NTPC specification of 18 m/s. Plesae clarify as to what value of flue gas velocity shall be considered for Wet Stack Design.	Bidder shall comply with the requirements of Technical Specifications.
5	Clause no 5.02.01 and 5.02.02 of sub-section-V of Section VI -Part-A	8	Wet Stack Study consisting of 1:12 Physical flow Model, computational flow model for plume downwash analysis, physical or computational flow model for CEMS elevation flow performance shall be carried out by bidder.	Considering one liner one absorber configuration specified by NTPC along with total number of Power Plant Units under LOT-1A, a very large number of studies are required to be carried out. As time required for these studies is substantial , it is requested to remove the studies under the mentioned clauses from the scope of the bidder.	Bidder shall comply with the requirements of Technical Specifications.
6	Clause no 1.00.00 Sr. no 7-(iii), of sub-section-V of Section VI -Part-A	1	Design Point : H20 = 3.958	It appears correct figure for moisture in design point is 13.958. NTPC to confirm.	Refer necessary amendment in this regard.
7	Clause no 2.00.00 & 3.00.00, of sub-section-V of Section VI -Part-A	3	Meja-I 2x660 MW	MEJA-I, 2x660 MW power station is appearing in both 2.00.00 & 3.00.00 .NTPC to clarify Design Data for Meja-I project FGD system	Refer necessary amendment in this regard.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	NTPC Clarifications
1169.	Part-A- Sub Section-II-A6	Clause no.7.08- Page no.19	Foundation System and Geotechnical Data- Type of Foundation system to be adopted- Open Foundation system.	The foundation design shall be based on final recommendations of geotechnical investigation report approved by Client during execution. Provision shall be made for appropriate compensation If any major variation in the soil data/ sub-soil conditions if identified.	Bidder may refer Cl. No. 7.00.03. If bidder feels, data provided is not adequate, he may carry out geotechnical investigation for bidding purpose. Further, Bidder shall comply the provisions of Technical Specification.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	NTPC Clarifications
1170.	Sub-Section-IVD -CIVIL WORKS	Clause no.12.00	RCC Roads & RCC Drains	Bidder understands that only approach roads along with drains on both sides shall be provided from the new structures of the proposed FGD. The main plant roads and drains shall be in the scope of the client. Please confirm.	Refer Scope of work. Refer clause 2.00.00 Section-VI, Part-A of technical specification
1171.	Sub-Section-IVD -CIVIL WORKS	Clause no.13.00	Gate Along Boundary Wall	Bidder understands that any works for construction of gate along boundary wall is excluded from the bidders scope of work.	Refer Scope of work. Refer clause 2.00.00 Section-VI, Part-A of technical specification.
1172.	Sub-Section-IVD -CIVIL WORKS	Clause no.4.01	Contractors scope shall include construction of necessary culverts below railway lines/ roads as per the railway/IRC standards and shall take approvals of railway culverts from the concerned railway authorities.	Bidder has considered RCC hume pipe culverts only below the approach roads in the scope of works for this package. Bidder has excluded the construction of culverts below railway lines and taking their approvals from necessary railway authorities. Bidder request client to kindly confirm.	Bidder shall comply with technical specification requirement.
1173.	Sub-Section-IVD -CIVIL WORKS	Clause no.14.00	The Storm Water drainage for any area under consideration shall be taken in to account the finished grade levels of the area.	Bidder has considered only the drains along the approach roads and garland drains around the proposed structures. These drains shall be connected to the nearest main plant drains with proper slopes. Please confirm.	Bidder's understanding is correct.

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	NTPC Clarifications
1174.	Sub-Section-IVD -CIVIL WORKS	Clause no.25.02	Excavations in hard rock shall be carried by Blasting if required. The contractor shall obtain license from the competent authorities for undertaking blasting works.	Bidder request client to take necessary statutory permissions required for Blasting from the concerned authorities. Bidder has excluded these from their scope of work.	Bidder shall comply the provisions of Technical Specification.
1175.	Sub Section I- M1	Clause 5.06.06	Mist eliminator	Whether bidder can propose roof type ME with PP material	Bidder shall comply with the requirements of Technical Specifications.
1176.	Sub Section I- M1	Clause 5.03.02	Oxidation Blower	The stoichiometric ratio of 2.5 was mostly used in the past for grid type of oxidation, now a day with new spargers, lower SR typically below 2 are in use, can we consider lower SR. Also whether we can offer 3 blowers (2W+1S) common for two units	Bidder shall comply with the requirements of Technical Specifications.
1177.	Extension			As explained during pre-bid meeting, requirement of site visits and overall complex nature of project, we request the bid submission date extension up to 17.10.2017	Not a technical query.

S. No.	Section	Clause No	Page No.	Statement of Deviation/Part/Chapter	Variations / Exceptions	NTPC Clarifications
B.	TECHNICAL DEVIATION					

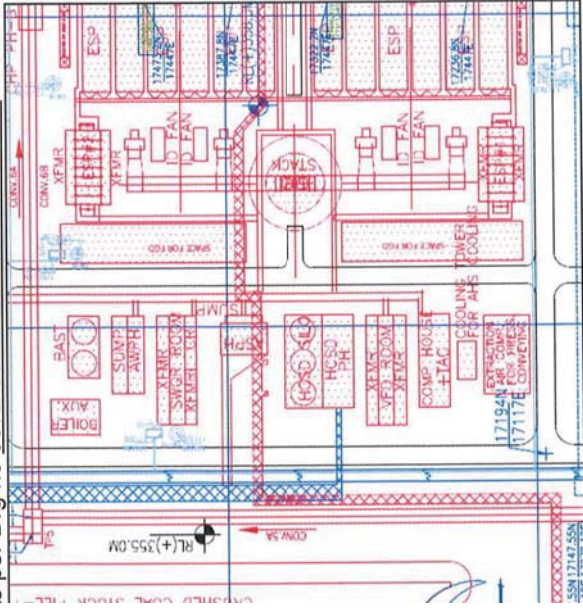
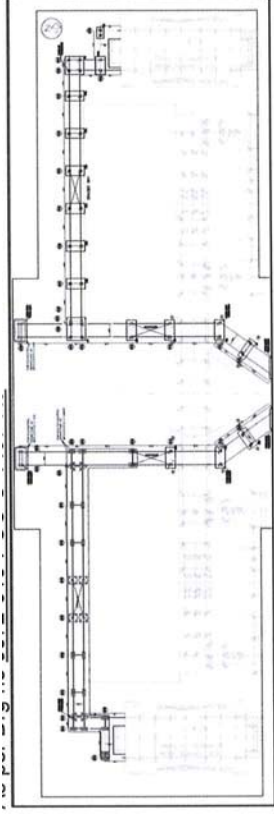
CLARIFICATION No.01 (TECHNICAL)**Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects**

1178.				Location of new low height wet stack	According to the technical specification, low height wet chimney shall be installed. However in the drawing, there is not enough space for new chimney. Please inform the location for wet chimney. If treated flue gas from FGD system shall be exhausted via existing chimney instead of new stack, lining work for duct and existing chimney will be required. Please confirm the duct arrangement and clarify scope of lining work.	Bidder shall comply with the requirements of Technical Specifications.
1179.				Space for FGD system	According to the drawing, it is expected that there is not enough space for new FGD system.	Bidder shall comply with the requirements of Technical Specifications.
1180.	Part-A-Sec-V	2.00.00	3 of 26	The flue gas desulphurization (FGD) system for MOUDA- II 2 x 660MW, TANDA - II 2 x 660MW, NABINAGAR- I 2 x 660MW, MEJA- I 2 x 660MW, & BARH- 3x 660MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below.	Please clarify which design requirements shall be applied to MEJA- I 2 x 660MW project.	Refer necessary amendment in this regard.
		3.00.00	5 of 26	The flue gas desulphurization (FGD) system for SOLAPUR- II 2 x 660MW & MEJA- I 2 x 660MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table below.		
S. No.	Section/Part/chapter	Clause No	Page No.	Bid Specification	Clarification sought by the bidder	NTPC Clarifications

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1181.	SUB-SECTION I LA3 PROJECT INFORMATION -GADARWARA- 1 2X800MW	DRG NO. 9572- 999-POC-F-001 REV 5D1 GENERAL LAYOUT PLAN & 9572-31 5-	Cable trestle layout is different between cable trestle drawing and General Layout Plan: s per Drg no 9572-999-POC-F-001-Rev 5D1  	Bidder to refer Amended GLP being issued separately.

Please clarify which one to follow.

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1182.			Primary Crusher House	NTPC is requested to provide the following drawings: 1) Conveyor and trusses from ground Hopper 2) Drawing for primary crusher house plan and side view	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.
1183.			Water source	NTPC is requested to confirm terminal point of clarified water	Provisions of Technical specification are clear. Bidder shall comply with the same.

Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.	Page		

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1184.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Trestles shown near to "Space for FGD"	Bidder wish to clarify that during their site visit, they have seen that the Trestles near "Space for FGD" is under construction, so Bidder understand that Employer will provide space in the existing/under construction trestles to install bidders supplied cables & pipes for FGD.	Stipulations, as given under Clause 14.00.00 Sub Section-III-A1 Section –VI, Part-A, shall be complied with w.r.t trestles. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1185.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Pipe/Cable Trestles & ID Fan out duct supports around FGD area	Bidder request employer to furnish the foundation drawings of ID Fan outlet ducts and Trestles installed around FGD area for both Unit-1 & Unit-2.	Requested foundation drawings will be discussed with the successful bidders. Bidder to refer Table 7 of Sub Section- II-A2 PROJECT INFORMATION (LARA-2x800MW) Section –VI, Part-A for pipe/cable trestle drawings.
1186.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	ESP control room near FGD area for Unit-1 & Unit-2	Bidder request Employer to furnish the foundation drawings of ESP control rooms (which is coming near to FGD area) under construction enabling Bid-	Requested foundation drawings will be discussed with the successful bidders.

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1187.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Existing ID Fan (2 nos. per Boiler) outlet ducts entering to Stack	der to finalise the layout of FGD equipments.	Bidder to carry out its own assessment during the site visit and offer a suitable design of the same.
1188.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Space For FGD	During Bidders site visit, it was observed that there are some Contractors site offices already existing in the Space marked for FGD and some Contractors offices/stores are made of Asbestos. Removal of these office spaces and asbestos shall be excluded from Contractors's scope. Employer is requested to confirm. Employer is also requested to furnish the clear leveled land (FGL)for the spaces marked for FGD.	Bidder to refer the revised GLP in amendments issued.

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1189.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Space for FGD in the Green Belt	During Bidders site visit, it was observed that there a Tree is falling in the Green Belt area (Space for FGD). Bidder understands that the cutting and transplantation of trees shall be in Employer scope and the same shall be completed before handover of site to Contractor. Employer is requested to confirm on Bidders understanding.	Bidder to refer the revised GLP in amendments issued.
1190.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	2 nos. Belt conveyor (1A & 1B) traveling from TP-2 to Crusher House	Bidder requests employer to furnish the following detail of Conveyor 1A & 1B between TP-2 to Crusher House: - Structural Arrangement - Drawings of Galary & Supports & their Foundations - GA of Conveyors and supporting foundations. - Capacity of existing coal conveyors etc.	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1191.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	Geotechnical Investigation Scheme(Clause- 7.08.000- page 21 of 48)	Soil Data and Foundation System	Bidder request Owner to provide the soil resistivity values for the FGD designated area.	Bidder may refer necessary Amendment.
1192.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Storage/Laydown area/Area for dumping of excavated material	During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping other than the areas identified for FGD. Bidder request Owner to please earmark areas at site for laydown/storage/ excavated material dumping.	Bidder to refer the revised GLP in amendments issued.
1193.	SECTION – VI, PART-A	SUB-SECTION-II-A2 (Project Information- LARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9548-999-POM-F-001, Rev-6D0)	Underground substructures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities , utilities etc around the FGD area .	Same will be discussed with the successful bidder during detail engg..
1194.	SECTION – VI, PART-A	SUB-SECTION-II-A4 (Project Information- Darlipalli-2x800 MW)	GLP (Drawing No. 9549-999-POC-F-001, Rev-9)	Trestles shown near to "Space for FGD"	Bidder wish to clarify that during their site visit, they have seen that the Trestles near "Space for FGD" is under construction, so Bidder understand that Employer	Stipulations, as given under Clause 14.00.00 Sub Section-III-A1 Section –VI, Part-A, shall be complied with w.r.t trestles.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					will provide space in the existing/under construction trestles to install bidders supplied cables & pipes for FGD.	Bidder shall comply with technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1195.	SECTION – VI, PART-A	SUB-SECTION-II-A4(Project Information-Darlipalli-2x800 MW)	GLP (Drawing No. 9549-999-POC-F-001, Rev-9)	Space For FGD	During Bidders site visit, it was observed that there are some Contractors site offices already existing in the Space marked for FGD and some Contractors offices/stores are made of Asbestos. Removal of these office spaces and asbestos shall be excluded from Contractors's scope. Employer is requested to confirm. Employer is also requested to furnish the clear leveled land (FGL)for the spaces marked for FGD.	Bidder to refer the revised GLP in amendments issued.
1196.	SECTION – VI, PART-A	SUB-SECTION-II-A4 (Project Information-Darlipalli-2x800 MW)	GLP (Drawing No. 9549-999-POC-F-001, Rev-9)	Crusher House	Employer is requested to furnish the scheme/routing of limestone conveyong from coal crusher house to FGD area for better understanding.	Bidder may please refer to the layout drawing furnished with tender. Also Bidder may visit site for clarity. Accordingly Bidder may come up with feasible routing.

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1197.	SECTION – VI, PART-A	SUB-SECTION-II-A4 (Project Information-Darlipalli-2x800 MW)	Geotechnical Investigation Scheme(Clause-7.08.000- page19 of 30)	Soil Data and Foundation System	Bidder request Owner to provide the soil resistivity values for the FGD designated area.	Bidder may refer necessary Amendment.
1198.	SECTION – VI, PART-A	SUB-SECTION-II-A4 (Project Information-Darlipalli-2x800 MW)	GLP (Drawing No. 9549-999-POC-F-001, Rev-9)	Storage/Laydown area/Area for dumping of excavated material	During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping other than the areas identified for FGD. Bidder request Owner to please earmark areas at site for laydown/storage/ excavated material dumping.	Bidder to refer the revised GLP in amendments issued.
1199.	SECTION – VI, PART-A	SUB-SECTION-II-A4 (Project Information-Darlipalli-2x800 MW)	GLP (Drawing No. 9549-999-POC-F-001, Rev-9)	Underground structures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities , utilities etc around the FGD area .	Same will be discussed during the detail engg. with the successful bidder.
1200.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information-Barh STPP, Stage -I (3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Space for FGD (650m x 131 m)	During Bidders site visit, it was observed that there are some Contractors site office, store is already exist in the Space marked for FGD (650m x 131m). Removal of these office spaces and asbestos shall be excluded	Bidder to refer the revised GLP in amendments issued.

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					from Contractors's scope. Employer is requested to confirm. Employer is requested to furnish the clear leveled land for the spaces marked for FGD.	
1201.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage -I (3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Space For FGD	During Bidders site visit, it was observed that there are some Contractors site offices already existing in the Space marked for FGD and some Contractors offices/stores are made of Asbestos. Removal of these office spaces and asbestos shall be excluded from Contractors's scope. Employer is requested to confirm. Employer is also requested to furnish the clear leveled land (FGL)for the spaces marked for FGD.	Bidder to refer the revised GLP in amendments issued.
1202.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage -I (3x660 MW)	GLP (Drawing No. 9558/9560-999-POC-F-001, Rev-8-D0)	Trestles shown near to "Space for FGD"	Bidder wish to clarify that during their site visit, they have seen that the Trestles near "Space for FGD" is under construction, so Bidder	Stipulations, as given under Clause 14.00.00 Sub Section-III-A1 Section –VI, Part-A, shall be complied with w.r.t

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					understands that Employer will provide space in the existing/under construction trestles to install bidders supplied cables & pipes for FGD.	trestles. Bidder shall comply with technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1203.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage-I (3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Pipe/Cable Trestles, Conveyors Galary, Ash Water & Ash Slurry Pump houses etc. naer FGD area	Bidder request employer to furnish the elevation drawings & foundation drawings of Pipe/Cable Trestles, Conveyors Galary, Ash Water & Ash Slurry Pump houses etc. which is coming near FGD area and the FGD ducting needs to be routed through this.	Bidder to refer the revised GLP in amendments issued.
1204.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage-I (3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Space for FGD	During Bidders site visit, it was observed that there a Tree is falling in the Green Belt area (Space for FGD). Bidder understands that the cutting and transplantation of trees shall be in Employer scope and the same shall be completed before handover of site to Contractor. Em-	

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1205.	SECTION – VI, PART-A	SUB-SECTION-II-A10(Project Information-Barh STPP, Stage -I (3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	2 nos. Belt conveyor (15A & 15B) traveling from TP-25 to Crusher House II	player is requested to confirm on Bidders understanding. Bidder requests employer to furnish the following detail of Conveyor 15A & 15B between TP-25 to Crusher House II:- Structural Arrangement Drawings of Galary & Supports & their foundations- GA of Conveyors & their foundations- Capacity of existing coal conveyors etc.	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.
1206.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information-Barh STPP, Stage -I (3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Space for FGD (220m x 25m)	This space (220mx25m) is falling near to the plant boundary railway line area. As the width of this space is 25m and the raft of new Stack will be more then 25mtr., this space can not be used for new wet stack. Bidder requests Employer to earmark additional space	Bidder to refer the revised GLP in amendments issued.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					(more than 35mtr width) where new wet stack can be erected.	
1207.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage-I- 3x660 MW)	Geotechnical Investigation Scheme(Clause- 7.00.00- page10 of 30)	Soil Data and Foundation System	Bidder request Owner to provide the soil resitivity values for the FGD designed area.	Bidder may refer necessary Amendment.
1208.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage-I- 3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Storage/Laydown area/Area for dumping of excavated material	During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping other than the areas identified for FGD. Bidder request Owner to please earmark areas at site for laydown/storage/ excavated material dumping.	Bidder to refer the revised GLP in amendments issued.
1209.	SECTION – VI, PART-A	SUB-SECTION-II-A10 (Project Information- Barh STPP, Stage-I- 3x660 MW)	GLP (Drawing No. 95558/9560-999-POC-F-001, Rev-8-D0)	Underground substructures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities , utilities etc around the FGD area .	Same will be discussed with the successful bidder during the detail engg. stage.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1210.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)	GLP (Drawing No. 0370-999-POC-F-001, Rev-9)	2 nos. Belt conveyor (2A & 2B) traveling from PH-1 to Crusher House I	Bidder request employer to furnish the following detail of Conveyor 2A & 2B between PH-1 to Crusher House I: - Structural Arrangement - Structural Drawings of Galary & Supports - GA of Conveyors - Capacity of existing coal conveyors etc.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1211.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)	GLP (Drawing No. 0370-999-POC-F-001, Rev-9)	Pipe/Cable trusses traveling near FGD area	Bidder request Employer to furnish the Foundation drawing of Cable/pipe Trestles coming near ID Fan outlet duct entering to stack and near FGD area.	Bidder to refer Table 6 of Sub Section- II-A8 PROJECT INFORMATION (NABINAGAR STPP-I 3 X660MW) Section –VI, Part-A for pipe/cable trestle drawings.
1212.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)	GLP (Drawing No. 0370-999-POC-F-001, Rev-9)	Trestles shown near to "Space for FGD"	Bidder wish to clarify that during their site visit, they have seen that the Trestles near "Space for FGD" is under construction, so Bidder understand that Employer will provide space in the exist-	Stipulations, as given under Clause 14.00.00 Sub Section- III-A1 Section –VI, Part-A, shall be complied with w.r.t trestles. Bidder shall comply with technical specification re-

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1213.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)		Space For FGD	ing/under construction trestles to install bidders supplied cables & pipes for FGD.	quirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1214.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)	Geotechnical Investigation Scheme(Clause- 7.08.00- page19 of 31)	Soil Data and Foundation System	During Bidders site visit, it was observed that there are some Contractors site office/store is already exist in the Space marked for FGD. So Employer is requested to furnish the clear levelled land for the spaces marked for FGD.	Bidder to refer the revised GLP in issued amendments.
1215.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)	GLP (Drawing No. 0370-999-POC-F-001, Rev-9)	Storage/Laydown area/Area for dumping of excavated material	Bidder request Owner to provide the soil resistivity values for the FGD designated area. During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping other than the areas identified for FGD. Bidder	Bidder may refer necessary Amendment. Bidder to refer the revised GLP in issued amendments.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1216.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar STPP-I, 3x660 MW)	GLP (Drawing No. 0370-999-POC-F-001, Rev-9)	Underground substructures, sewer pipes, water pipes, cables etc around the FGD	request Owner to please earmark areas at site for laydown/storage/ excavated material dumping. Bidder request Owner to please provide the drawings for underground pipes, cables, amenities, utilities etc around the FGD area .	Same will be discussed with the successful bidder during the detail engg. stage.
1217.	SECTION – VI, PART-A	SUB-SECTION-II-A8(Project Information- Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	Trestles shown near to "Space for FGD"	Bidder wish to clarify that during their site visit, they have seen that the Trestles near "Space for FGD" is under construction, so Bidder understand that Employer will provide space in the existing/under construction trestles to install bidders supplied cables & pipes for FGD.	Stipulations, as given under Clause 14.00.00 Sub Section- III-A1 Section –VI, Part-A, shall be complied with w.r.t trestles. Bidder shall comply with technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1218.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	Space For FGD	During Bidders site visit, it was observed that there are some Contractors site offices already existing in the Space marked for FGD and some Contractors offices/stores are made of Asbestos. Removal of these office spaces and asbestos shall be excluded from Contractors's scope. Employer is requested to confirm. Employer is also requested to furnish the cleared land (FGL) for the spaces marked for FGD.	Bidder to refer the revised GLP in issued amendments.
1219.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	2 nos. Belt conveyor (2A & 2B) traveling from PH-1 to Crusher House	Bidder request employer to furnish the following detail of Conveyor 2A & 2B between PH-1 to Crusher House: - Structural Arrangement - Drawings of Galary & Supports & foundation - GA of Conveyors &	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1220.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	Railway tracks between Crusher house & Space for FGD	foundation. - Capacity of existing coal conveyors etc. Bidder wish to clarify that, if limestone shall be transferred from existing coal conveyors to FGD area, the conveyors/slurry pipes needs to routed over the railway lines. So Employer is requested to furnish the guideline, if any, needs to be considered for this. Also Employer is requested to furnish the GA drawing of railways tracks coming between Coal conveyors (including CH) & FGD area.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1221.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	Pipe/Cable trunks near FGD area	Bidder request Employer to furnish the GA Drawings of pipe & cable trunks in front of the Stacks,	Bidder to refer Amended Project Information included in Table 6 of Sub Section- II-A 11 PROJECT

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					ID Fan outlet ducts along with associated foundation drawings etc. enabling Bidder to decide the duct layout from tapping point to FGD area	INFORMATION (NABINAGAR TPP) Section –VI Part-A, being issued separately, for pipe/cable trestle drawings. Requested drawings as ID Fan outlet ducts foundation drawings will be discussed with the successful bidder during the detail engg. stage.
1222.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar TPP, 4x250 MW)	Geotechnical Investigation Scheme(Clause-7.08.00- page 20 of 29)	Soil Data and Foundation System	Bidder request Owner to provide the soil resistivity values for the FGD designated area.	Bidder to refer necessary amendment in this regard.
1223.	SECTION – VI, PART-A	SUB-SECTION-II-A8 (Project Information- Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	Storage/Laydown area/Area for dumping of excavated material	During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping other than the areas identified for FGD. Bidder request Owner to please earmark areas at site for	Bidder to refer the revised GLP in issued amendments.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1224.	SECTION – VI, PART-A	SUB-SECTION-II-A8(Project Information-Nabinagar TPP, 4x250 MW)	GLP (Drawing No. 0270-999-POC-F-001, Rev-6)	Underground structures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities, utilities etc around the FGD area .	Same will be discussed with the successful bidder during the detail engg. stage.
1225.	SECTION – VI, PART-E	Tender Drawing List-Electrical Single Line Diagram of FGD Package	Drawing No. 0011-109-POE-J-001A-E, Rev-A	11 KV KV HT SWGR Panel	Bidder wish to clarify that during their site visit, they have found only 6.6 KV HT SWGR at the main TG building instead of 11 KV. Bidder request Employer to furnish the revised SLD for BRBCL site.	Refer amended Tender SLD.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1226.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information-MOUDA Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9561/9575-999-POC-F-001, Rev-11D0)	Railways tracks between Crusher house & Space for FGD	Bidder wish to clarify that, if limestone will be transferred from existing coal conveyors to FGD area, which is far away from FGD area, the conveyors/slurry pipes needs to routed over the railway lines & road. So Employer is requested to furnish the following: 1. Specific guideline for crossing the rail track , if any, 2. Employer is requested to furnish the GA drawing of railways tracks coming between Coal conveyors (including CH) & FGD area. 3. Employer is requested to furnish the GA drawings or details from conveyer 15 A/B to CH2, Structural Arrangement Drawings of Galary &	Same will be discussed with the successful bidder during the detail engg. stage.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					Supports along with associated foundations and Capacity of existing coal conveyors etc.	
1227.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information-MOUDA Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9561/9575-999-POC-F-001, Rev-11D0)	Space for Laydown, pre-assemblies & site office	Bidder requests owner to also allocate space for Laydown , Site Office and Pre-assembly near allocated FGD space as per GLP.	Bidder to refer the revised GLP in issued amendments.
1228.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information-MOUDA Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9561/9575-999-POC-F-001, Rev-11D0)	First Aid Center	Bidder understands that the existing First-Aid Center facilities shall be extended to Bidder's Site Personnel.	Bidder to refer cl.no. 28.05.00 of section VI part D in this regard.
1229.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information-MOUDA Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9561/9575-999-POC-F-001, Rev-11D0)	Fire Tender	Bidder understand that Owner shall extend the Fire Tender services in case of Fire emergency.	Bidder to refer cl.no. 30.00.00 of section VI part D in this regard.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1230.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information- MOUDA Super Thermal Power Project- 2x660 MW)	GLP (Drawing No. 9561/9575-999-POC-F-001, Rev-11D0)	Pipe rack /Cable Trestles near FGD area	Bidder request Employer to furnish the GA Drawings of pipe rack & cable Trestles in front of the Stack and ID Fan outlet ducts etc. enabling us to decide the duct layout from tapping point to FGD area and also advise if any space available so that same can be utilized for FGD	Bidder to refer drawings at S.No 6 and 7 in Page no 40/40 Sub Section- II-A5 PROJECT INFORMATION (MOUDA-II 2x660MW) Section –VI, Part-A for pipe/cable trestle drawings. Requested documents will be discussed with the successful bidder during the detail engg. stage.
1231.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information- MOUDA Super Thermal Power Project- 2x660 MW)	Geotechnical Investigation Scheme(Clause- 7.08.00- page 20 of 40)	Soil Data and Foundation System	Bidder request Owner to provide the soil resistivity values for the FGD designated area.	Bidder may refer Amendment .
1232.	SECTION – VI, PART-A	SUB-SECTION-II-A5 (Project Information- MOUDA Super Thermal Power Project- 2x660 MW)	GLP (Drawing No. 9561/9575-999-POC-F-001, Rev-11D0)	Underground structures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities, utilities etc around the FGD area .	Same will be discussed with the successful bidder during the detail engg. stage.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1233.	SECTION – VI, PART-A	SUB-SECTION-II-A3(Project Information-GADARWARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	Drawings / details required for conveyer 2A / 2B, CRH & TP3 and conveyer 4 A / B	Bidder wish to clarify that, if limestone shall be transferred from existing coal conveyors to FGD area, So Employer is requested to furnish the following:1. Employer is requested to furnish the GA drawing or details from conveyer 2A / 2B, CRH & TP3 and conveyer 4 A /B, Structural Arrangement Drawings of Galary & Supports along with associated foundations and Capacity of existing coal conveyors etc.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1234.	SECTION – VI, PART-A	SUB-SECTION-II-A3 (Project Information-GADARWARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	Space for Laydown, pre-assemblies & site office	Bidder requests owner to also allocate space for Laydown , Site Office and Pre-assembly near allocated FGD space as per GLP.	Bidder to refer the revised GLP in issued amendments.
1235.	SECTION – VI, PART-A	SUB-SECTION-II-A3 (Project Information-GADARWARA Super	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	Space for FGD	Bidder understand that allocated space for FGD near chimney is not sufficient.	Bidder to refer Amended GLP being issued separately.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
		Thermal Power Project-2x800 MW)			cient and some space in front of TP3 and Conveyor 4 A/B is available. Employer is requested to furnish the clear & levelled space there.	Bidder to also refer TOPOGRAPHICAL Survey drawing provided in the project information chapter.
1236.	SECTION – VI, PART-A	SUB-SECTION-II-A3 (Project Information-GADARWARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	First Aid Center	Bidder understands that the existing First-Aid Center facilities shall be extended to Bidder's Site Personnel.	Bidder to refer cl.no. 28.05.00 of section VI part D in this regard.
1237.	SECTION – VI, PART-A	SUB-SECTION-II-A3 (Project Information-GADARWARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	Fire Tender	Bidder understand that Owner shall extend the Fire Tender services in case of Fire emergency.	Bidder to refer cl.no. 30.00.00 of section VI part D in this regard.
1238.	SECTION – VI, PART-A	SUB-SECTION-II-A3 (Project Information-GADARWARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	Cable Trestles from ESP control room near FGD area	As per current site status, cable Trestles & cable laying from ESP control room for unit #1 & 2 and in front of chimney yet not installed. The allocated space near chimney for FGD is nearly 25 mts x	Bidder to refer Amended GLP being issued separately.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					106 mts both sides which is not sufficient to place FGD system. Employer is requested to re-locate the Cable Trestles towards either road or ID fan duct side so that a clear space width of around 40 mts can utilized for FGD system. Employer is requested to confirm.	
1239.	SECTION – VI, PART-A	SUB-SECTION-II-A3 (Project Information- GADARWARA Super Thermal Power Project-2x800 MW)	GLP (Drawing No. 9572-999-POC-F-001, Rev-5D1)	Underground structures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities, utilities etc around the FGD area .	Same will be discussed with the successful bidder during the detail engg. stage.
1240.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information- Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Drawings / details required	Bidder request employer to furnish the foundation drawings of ID Fan outlet ducts and pipe/cable Trestles installed ESP-CR of unit 1 to ESP-CR of Unit 2 and Pipe/cable trestle coming from boiler near	Requested foundation drawings will be discussed with the successful bidder during the detail engg. stage. Bidder to refer Table 7 of Sub Section- II-A 6 PRO-

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Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					the existing 275 mtr Stack.	JECT INFORMATION (SOLAPUR 2X660MW) Section –VI Part-A, for Pipe/cable trestle drawings.
1241.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information-Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Space for FGD (35X1000 mtr) as shown near Aux boiler	At present temporary 11 KVA line and transformer is available in this area. Employer is requested to furnish the clear levelled land for the spaces marked for FGD.	Bidder to refer the revised GLP in issued amendments.
1242.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information-Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Are marked as "Laydown & pre-assembly" between 500N/1165E and 500N/1527E.	Bidder request employer to allow this area for installation of FGD equipment's	Laydown and assembly area is in space identified for Stage-II which cannot be used.
1243.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information-Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Road behind the existing stack.	Bidder wish to clarify that after taking flue gas tapping for FGD from existing flue gas duct to Stack, FGD flue gas duct supports may fall on both side of footpath along the	Bidder to refer the revised GLP in issued amendments.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					road.	
1244.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information- Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Limestone handling system	If Employer wishes to use limestone handling system by using existing WT, in that case employer is requested to share the conveyor detail drawings from UGTP-1 to CH, including detail drawing of UGTP-1. along with the associated foundations.	Same will be discussed with the successful bidder during the detail engg. stage.
1245.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information- Solapur Super Thermal Power Project-2x660 MW)	Geotechnical Investigation Scheme(Clause-7.08.00- page 19 of 31)	Soil Data and Foundation System	Bidder request Owner to provide the soil resistivity values for the FGD designated area.	Bidder may refer Amendment .
1246.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information- Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Storage/Laydown area/Area for dumping of excavated material	During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping	Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1247.	SECTION – VI, PART-A	SUB-SECTION-II-A6 (Project Information- Solapur Super Thermal Power Project-2x660 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Underground substructures, sewer pipes, water pipes, cables etc around the FGD	other than the areas identified for FGD. Bidder request Owner to please earmark areas at site for laydown/storage/ excavated material dumping.	Same will be discussed with the successful bidder during the detail engg. stage.
1248.	SECTION – VI, PART-A	SUB-SECTION-II-A1 (Project Information- Kudgi Super Thermal Power Project-3x800 MW)	GLP (Drawing No. 9573-999-POC-F-001, Rev-6D1)	Unit 2 & 3 ID Fan outlet ducts to existing stack. Pipe/Cable Trestles near Unit #2 and 3 common Stack.	Bidder request employer to furnish the foundation drawings of ID Fan outlet ducts and pipe/cable Trestles installed near the existing common stack of Unit 2 & 3 .	Requested foundation drawings will be discussed with the successful bidders. Bidder to refer Table 7 of Sub Section- II-A1 PROJECT INFORMATION (KUDGI 3X800MW) Section –VI Part-A for Pipe/cable trestle drawings.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1249.	SECTION – VI, PART-A	SUB-SECTION-II-A1 (Project Information-Kudgi Super Thermal Power Project-3x800 MW)	GLP (Drawing No. 9573-999-POC-F-001, Rev-6D1)	Space for FGD near the Aux. Boiler	At present temporary neutralization pond and acid pond is constructed in the proposed FGD area. Employer is requested to furnish the clear levelled, compacted land for the spaces marked for FGD.	Bidder to refer the revised GLP in issued amendments.
1250.	SECTION – VI, PART-A	SUB-SECTION-II-A1 (Project Information-Kudgi Super Thermal Power Project-3x800 MW)	GLP (Drawing No. 9573-999-POC-F-001, Rev-6D1)	Limestone handling system	If Employer wishes to use limestone handling system by using existing WT, in that case employer is requested to share the conveyor detail drawings from WT to CH including detail drgs of all TP and pent house coming in between WT & CH.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1251.	SECTION – VI, PART-A	SUB-SECTION-II-A1 (Project Information-Kudgi Super Thermal Power Project-3x800 MW)	Geotechnical Investigation Scheme (Clause 7.08.00- page 19 of 38)	Soil Data and Foundation System	Bidder request Owner to provide the soil resistivity values for the FGD designated area.	Bidder may refer Amendment in this regard.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1252.	SECTION – VI, PART-A	SUB-SECTION-II-A1 (Project Information- Kudgi Super Thermal Power Project-3x800 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Storage/Laydown area/Area for dumping of excavated material	During site visit, it has been observed that no area has been earmarked for laydown/storage/ excavated material dumping other than the areas identified for FGD. Bidder request Owner to please earmark areas at site for laydown/storage/ excavated material dumping.	Bidder to refer the revised GLP in issued amendments.
1253.	SECTION – VI, PART-A	SUB-SECTION-II-A1 (Project Information- Kudgi Super Thermal Power Project-3x800 MW)	GLP (Drawing No. 9571-999-POC-F-001, Rev-5D0)	Underground substructures, sewer pipes, water pipes, cables etc around the FGD	Bidder request Owner to please provide the drawings for underground pipes, cables, amenities, utilities etc around the FGD area .	Same will be discussed with the successful bidder during the detail engg. stage.
1254.	SECTION – VI, PART-A	Subsection-III-D Civil	1.06.00	Uniform Finished ground level (FGL) in FGD absorber area shall be made available by the owner at a level specified in tender drawing	Bidder understand that Uniformed Finished ground level will be arranged by Employer (at NTP) for the area's allocated for FGD (Space for FGD mentioned in the layout drawing) Employer is requested to	Site levelling shall be done by Owner as per the levels specified in GLP in tender document. Only site clearance and minor grading is in bidder's scope.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					confirm on Bidders understanding.	
1255.	GENERAL POINT			Employers Hostels/guest house	Employer is requested to allow their existing hostels/guest house on chargeable basis.	This may not be possible, however during the execution stage the same can be discussed with our site.
1256.	SECTION – VI, PART-B	Subsection-IV-D Civil Works	39.00.00	Sand aggregate for Construction		Query is not clear.
1257.	GENERAL POINT			Topographical Survey drawing	Bidder request topographical survey drawing in Autocad format of all proposed FGD site..	Bidder to refer necessary amendment in this regard.
1258.	GENERAL POINT			Area Drainage Study report	Bidder request Owner to furnish Area Drainage Study report for planning the drainage in the area earmarked for FGD facilities of all proposed site.	Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1259.	SECTION – VI, PART-E	Tender Drawing List-Electrical Single Line Diagram of FGD Package	Drawing No. 0011-109-POE-J-001A-E, Rev-A	General Notes: Point no. 11: Panel being used for feeding of CHP/AHP HT Transformers.....	During site visit of all projects, it was observed that separate 11 KV HT SWGR's are available in for CHP & AHP. So Bidder understand that either CHP or AHP SWGR needs to be modified to connect the FGD new TIE SWGR not both (AHP & CHP) needs to be modified. Employer is requested to confirm on Bidders understanding.	Refer amended tender SLD.
1260.	SECTION – VI, PART-E	Tender Drawing List-Electrical Single Line Diagram of FGD Package	Drawing No. 0011-109-POE-J-001A-E, Rev-A	Laying of cables between main 11 KV HT SWGR & FGD new TIE SWGR, CHP/AHP SWGR	Bidder wish to clarify that during their site visits, they have seen the empty Cable Trestles between 11 KV HT SWGR (TG building) & FGD, CHP/AHP areas. Bidder understand that Employer will provide space in the existing/under construction trestles to install bidders	Refer amended tender SLD. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2.However bidder may visit the project in order to get itself acquainted with existing electrical of plant. GLP of respective plants has already been attached.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
					supplied cables for FGD and Bidder will not install any new Trestles for the same . Employer is requested to confirm on Bidders understanding.	
1261.	SECTION – VI, PART-A	SUB-SECTION-V SALIENT DESIGN DATA & SIZING	1.00.00, 2.00.00, 3.00.00, 4.00.00	HCL (PPM-WET): 45 for both guaranteee & design condition HF (ppm-wet): 12 for both guaranteee and design condition		Query is not clear.
1262.	SECTION – VI, PART-A	SUB-SECTION-IV TERMINAL POINTS AND EXCLUSION	1.08.00	Waste water : pH shall be 7.0 (approx) and temperature shall be <50 deg C		Query is not clear.
1263.	SECTION – VI, PART-A	SUB-SECTION-II-A5 PROJECT INFORMATION (MOUDA-II 2X660 MW)	ANNEXURE-II	Climatological table for MSL, Ambient temperature...		Query is not clear.
1264.	SECTION – VI, PART-A	SUB-SECTION-II-A9 PROJECT INFORMATION (MEJA TPP-I 2X660 MW)	ANNEXURE-II	Climatological table for MSL, Ambient temperature...		Query is not clear.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1265.	SECTION – VI, PART-A	SUB-SECTION-II-A6 PROJECT INFORMATION (SOLAPUR 2X660 MW)	ANNEXURE-II	23 OF 31 Climatological table for MSL, Ambient temperature...		Query is not clear.
1266.	SECTION – VI, PART-A	SUB-SECTION-II-A10PROJECT INFORMATION (BARH STPP STABIDDER-I 3X660 MW)	ANNEXURE-II	21 OF 30 Climatological table for MSL, Ambient temperature...		Query is not clear.
1267.	SECTION – VI, PART-A	SUB-SECTION-II-A7 (Project Information- Tanda TPP, Stage-II -2x660 MW)	GLP (Drawing No. 9562-999-POC-F-001, Rev-8D1)	Unit 5 & 6 ID Fan outlet ducts to existing stack. Pipe/Cable Trestles near Unit #5 and 6 common Stack.	Bidder request employer to furnish the foundation drawings of existing chimney, ID Fan outlet ducts and pipe/cable Trestles installed near the existing common stack of Unit 5 & 6 .	Bidder to refer Table provided at Page 33/33 of Sub Section- II-A7 PROJECT INFORMATION (TANDA-II 2X660MW) Section –VI Part-A for Pipe/cable trestle drawings. Requested foundation drawings will be discussed with the successful bidder during the detail engg. stage.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1268.	SECTION – VI, PART-A	SUB-SECTION-II-A7 (Project Information- Tanda TPP, Stage-II -2x660 MW)	GLP (Drawing No. 9562-999-POC-F-001, Rev-8D1)	Limestone & Gypsum handling system	Employer is requested to share the conveyor detail drawings from WT to CH including detail drgs of all TP and pent house coming in between WT & CH.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1269.	SECTION – VI, PART-A	SUB-SECTION-II-A7 (Project Information- Tanda TPP, Stage-II -2x660 MW)	GLP (Drawing No. 9562-999-POC-F-001, Rev-8D1)	Space for FGD in the Green Belt	During Bidders site visit, it is observed that there are trees coming in the Green Belt area (Space for FGD), so Bidder understand that the cutting of trees is in Employer scope. Employer is requested to confirm on Bidders understanding.	Bidder to refer the revised GLP in issued amendments.
1270.	SECTION – VI, PART-A	SUB-SECTION-II-A7 (Project Information- Tanda TPP, Stage-II -2x660 MW)	GLP (Drawing No. 9562-999-POC-F-001, Rev-8D1)	Soil Report & Borewell Details	Bidder request employer to provide the soil report and borewell details for allotted space for FGD	For Borelog details, bidder may refer Project information chapter furnished in Technical Specification for Tanda STPP.
1271.	SECTION – VI, PART-A	SUB-SECTION-II-A9 (Project Information- Meja TPP, Stage-I -2x660 MW)	GLP (Drawing No. 0360/0361-999-POC-F-001, Rev-6D0)	A) Unit 1 & 2 ID Fan outlet ducts to existing stack. B)Pipe/Cable Trestles near Unit #1 and 2	Bidder request employer to furnish the foundation drawings of existing chimney, ID Fan outlet ducts and pipe/cable	Requested foundation drawings will be discussed with the successful bidder. Bidder to refer Table 6 of

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CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl. No.	Specification Reference			Employer (NTPC) Specification	Bidder Requested Clarification	NTPC Clarifications
	Part	Sub-section	Clause no.			
1272.	SECTION – VI, PART-A	SUB-SECTION-II-A9 (Project Information- Meja TPP, Stage-I -2x660 MW)	GLP (Drawing No. 0360/0361-999-POC-F-001, Rev-6D0)	common Stack.	Trestles installed near the existing common stack of Unit 1 & 2.	Sub Section- II-A9 PROJECT INFORMATION (MEJA 2X660MW) Section –VI Part-A, for Pipe/cable trestle drawings.
1273.	SECTION – VI, PART-A	SUB-SECTION-II-A9 (Project Information- Meja TPP, Stage-I -2x660 MW)	GLP (Drawing No. 0360/0361-999-POC-F-001, Rev-6D0)	Limestone & Gypsum handling system	Employer is requested to share the conveyor detail drawings from WT to CH including detail drgs of all TP and pent house coming in between WT & CH.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1274.				Soil Report & Borewell Details	Bidder request employer to provide the soil report and borewell details for allotted space for FGD	Bidder may refer Amendment.
					What Size Limestone Incoming?	Technical specifications are clear in this regard.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulfurization (FGD) System Package for Lot 1A Projects



Sl.No	Section /Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
1275.	Section-VI Part-B Sub Section-I-M1 (FGD)	5.06.11	19 of 51	The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct shall be provided with 2 mm (minimum) thickness lining / cladding / wall paper of Alloy C276 / Alloy 59 or better material.	NTPC is requested to consider the following option for Absorber. " Cementitious Grouted Liner Plate over a Trowel-on Membrane ("Tile linings") over mild steel or a Liner Plate with RCC Absorber. A Wet Flue Gas Desulfurization ("WFGD") absorber requires an appropriate long-lasting lining to resist abrasion and corrosion resulting from the operating conditions within the WFGD absorber and the tile lining are widely accepted for over 25 years in USA and total WFGD units installed with Tile Linings are around 50,000 MW. The Tile Lining materials will be selected and designed by the Manufacturer to meet the criteria of WFGD and also these linings should have operational history in WFGD." NTPC to confirm the acceptability of the above.	Specification requirement is clear. Bidder shall comply with the specification requirements.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section /Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
1276.	Section-VI Part-B Sub Section-I-M7 ZERO LIQ-UID DIS-CHARGE SYSTEM	22-d	14 of 32	<u>Chemical feed pump suction piping,tubing and fittings</u> Size-1/2 inch OD minimum	NTPC is requested to accept minimum 1/4" OD tube.	This shall be finalized during detail engineering.
1277.	Section-VI Part-B Sub Section-I-M7 ZERO LIQ-UID DIS-CHARGE SYSTEM	3.01.00	3 of 32	The Clarifier outlet will be fed to the mechanical vapor recompression (MVR), Brine Concentrator and Crystallizer system.	The Process flow diagram shows Steam Driven Crystallizer whereas write up calls for MVR.NTPC to clarify	As mentioned in Cl. No. 2.00.00 D, Sub-section I-M7, Part-B, Auxiliary steam if required shall be provided by owner for start-up condition only. For continuous duty, Bidder to design the various systems considering power driven equipment and the same shall be considered in power guarantee.
	Section-VI Part-E Tender Drawings	Process flow diagram for Crystallizer system Drg No-0011-109-POM-A-005(SHT-3 of 3)		Steam Driven Crystallizer		

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1278.	Amendment No. 1 to Technical Specification (Section VI) Section VI Part A/ SUB-SECTION I / Intent of Specification	1.01.01	2 of 19	(New Clause added) Government of India has launched "Make in India" initiative to transform India into a global design and manufacturing hub. Accordingly, to promote manufacturing within India, the import content in Flue Gas Desulphurisation (FGD) System package has been restricted to 30% of the total Supply value quoted by Bidder in Price Schedule-1 plus Schedule-2. Bidder shall ensure that it does not import more than 30% of its Supplies and shall manufacture/ source equipment/ components from within India to meet the aforesaid requirement.	Owner vide Amendment no. 1 has restricted import content to 30% of the total supply value in order to promote "Make in India" initiative. The intent herein, as understood, is to maximise the supply from within India. As per tender specification, <i>'the absorber oxidation tank, absorber tower & absorber outlet duct shall be provided with 2 mm (minimum) thickness lining/ cladding/ wall paper of Alloy C276 / Alloy 59 or better material'</i> . These lining materials are exotic in nature, with voluminous requirement and no suppliers are available in India who can manufacture & supply the same. Majority of import content value is attributable to these lining materials.	Bidder to refer clarifications being issued separately.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Amendment No.01 to Bid Data Sheets (BDS): Section-III	ITB 26.4		26.4.1 LF Component (CIF price quoted in Schedule-1 plus CIF value of Import content of Ex-works price included in Schedule-2) quoted by Bidder, shall in no case be more than 30% of the total Supply value quoted by Bidder in Price Schedule-1 plus Price Schedule-2.	rials and we expect it to go beyond 30% of the total supply cost. To meet Owner's requirement of import restriction and support "Make in India" initiative, Bidder proposes use of Flake glass (FLRP) lining (manufactured & supplied by Indian suppliers) inside the absorber oxidation tank, absorber tower & absorber outlet duct. Kindly confirm. FLRP lining has been extensively used by Bidder's Collaborator world wide and is already a proven design for the intended application. Bidder may submit the references of global installations in case required by Owner for the necessary assessment.	
1279.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.02.00	1 of 3	One tapping from the common Flue Gas Duct going towards the existing Chimney (in case of twin flue chimney). No load of duct shall be transmitted on the Employers facilities.	Bidder proposes have an additional operation of taking one tapping each for each booster fan from existing flue gas duct (from ID fan to existing chimney) for both single flue chimney and twin flue chimney. NTPC is requested to confirm.	Bidder shall comply with the requirements of Technical Specifications.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1280.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.05.00	2 of 3	For FGD system, Contractor shall take a tap off suitably from the existing CW blow down header available near the CW pump house. The pressure available at TP will be 1.9 Ksc (gauge) wrt FGL (approx ..).	Bidder proposes that the Process water tap off line from the CW blow down header upto the identified FGD space shall be a) Buried under ground pipe. b) Supported on the Owner Pipe rack. NTPC is requested to confirm the same.	Shall be finalized during the course of detail engineering.
1281.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.03.00	1 of 3	Contractor shall take a tap off suitably from the existing Aux. steam header (Pr. 16 ata, Temp-21 0 deg. C) available at BC bay below deaerator floor.	Bidder proposes to have the tap off for Aux. steam at a location adjacent to the identified FGD area. NTPC is requested to confirm the same.	Provisions of Technical specification are clear. Bidder shall comply with the same.
1282.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.03.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	In case, if any of the existing structure is used for supporting utility lines, cables or equipments of FGD facility then NPTC shall provide all required documents of existing structure for verification and validation for structural stability. NTPC is requested to confirm the same.	Same will be discussed with the successful bidder during the detail engg. stage.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1283.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.03.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	Bidder proposes to use the vacant space / trays available in existing cable trestle. NTPC to kindly confirm.	Specification requirement is clear under the referred cl.no. 1.08.00 & related clauses. . Bidder shall comply with the specification requirements.
1284.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.03.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	Bidder proposes to use the vacant space / trays available in existing SWGR cable gallery. NTPC to kindly confirm.	Specification requirement is clear under the referred cl.no. 1.08.00 & related clauses. . Bidder shall comply with the specification requirements.
1285.	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	1.00.00	1 of 6	 all the equipment of Lime Stone Handling Plant & Gypsum Handling plant to be installed for FGD Package.....	NTPC is requested to identify the desired location of limestone and gypsum handling facilities or allow the bidder to place the location of the limestone and gypsum handling facilities based on feasibility suitable to bidder. NTPC is requested to confirm the same.	Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1286.	BARH	-	-	-	Space allocated for FGD area is currently being utilised by STG contractor for laydown area. Bidder requests NTPC to confirm that this identified space shall be available completely clear of any obstructions to the Bidder at the time of awarding of contract.	Bidder to refer the revised GLP in issued amendments.
1287.	2X800MW DARI LIPALI - GLP	-	-	2X800MW DARI LIPALI - FGD area identified in GLP drawing	The space identified for FGD area is adjacent to earthen bund of lagoon-1 and hence may not be suitable for controlled blasting for the purpose of excavation. Alternatively, bidder proposes to use the SG Contractor Space for FGD facilities. NTPC is requested to confirm the same.	Bidder to refer the revised GLP in issued amendments.
1288.	BARH	-	-	FGD space identified in GLP	Bidder requests NTPC to clearly identify the space / area allocations in GLP for FGD facilities envisaged respectively for Stage 1 and Stage 2.	Bidder to refer Amended GLP being issued separately.
1289.	BARH	-	-	FGD space identified in GLP	The identified area is the GLP is not sufficient for the FGD facilities, hence Bidder request NTPC to confirm whether the spaces identified under Laydown area, Temporary storage area for BTG contractors can be used for FGD facilities.	Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1290.	General - All Sites	-	-	FGD space identified in GLP	At the identified location for FGD facilities in GLP, NTPC is requested to provide the area free from any temporary structure (super structure and foundation) and the Land to be graded upto FGL. Kindly confirm.	Bidder to refer the revised GLP in issued amendments.
1291.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.01.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	As per tender terminal point information, all other utility pipe lines (Except process water) shall be tapped off along C row near CD bay rack. Bidder proposes to use client's pipe/cable rack for routing FGD Scope pipes/cables or else these tap offs shall be taken from client's pipe rack which is nearer to proposed FGD package. NTPC is requested to confirm.	Provisions of Technical specification are clear. Bidder shall comply with the same.
1292.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.08.00	2 of 3	FGD waste water pipes shall terminate along with isolation valve at 5 Meters near HCSD Mixing Tank, and 300 mm above FFL in HCSD Silo Area.	For terminating the waste water pipes near HCSD mixing tanks, bidder proposes to use the existing pipe rack available for routing and supporting the pipes. NTPC is requested to confirm the same.	Same will be discussed with the successful Bidder on case to case project specific basis.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1293.	ME/A	-	-	FGD space identified in GLP	Based on inputs received during the site visit at NTPC Meja, 7 nos of spaces / area are available for FGD facilities. Out of which only 1 is marked in the GLP drawing. Following are the remaining 6 areas. 1) 65x45: East of unit 1 ESP and pipe rack 2) 20x75: East of unit 1 ESP SWGR and pipe rack 3) 15x75: South of ID Fan duct and ESP cable rack. 4) 15x75: South of ID Fan duct and ESP cable rack. 6) 73x63: West of O&M Stores. 7) Polygon area 553 x 455: South of Stage 2 crushed coal stock pile-8 and north of Conveyor 1A/1B and 29A/29B. NTPC is requested to confirm the same.	Bidder to refer Amended GLP being issued separately.
1294.	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	Limestone received through Indian Railway Rakes will be unloaded in one of the side discharge Wagon Tipplers or Track Hopper of existing Coal Handling Plant (CHP). Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house....	For Meja stage-1 2x660MW: In order to plan the tap off for limestone conveyor from the the existing coal conveyor, bidder request NTPC to provide the conveyor profile from Pent House PH-1 upto Crusher House CH.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.

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1295.	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	Limestone received through Indian Railway Rakes will be unloaded in one of the side discharge Wagon Tipplers or Track Hopper of existing Coal Handling Plant (CHP). Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house....	Owing to space constraints in most of the projects in Bulk Lot 1A, Bidder proposes to use the existing coal conveyor/s after the Crusher House for conveying the crushed limestone upto the extent possible or nearest area identified for limestone handling / milling building. NTPC is requested to confirm the same	Bidder shall comply with technical specification stipulations
1296.	Tanda	-	-	FGD space identified in GLP	Bidder requests Owner to provide additional space for installation of limestone handling and slurry preparation system at the space / area allocated for Laydown & Pre-Assembly activities located north of O&M stores. NTPC is requested to confirm.	Bidder to refer the revised GLP in issued amendments.
1297.	Tanda	-	-	FGD space identified in GLP	Bidder proposes for additional space for emergency slurry tanks between TP-13, TP-14 and west of Coal stock pile. NTPC is requested to confirm.	Bidder to refer Amended GLP being issued separately.

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1298.	Tanda	-	-	FGD space identified in GLP	Bidder proposes for additional space for installation of limestone handling equipment at green belt which is between Fire station building and Hasimpur village compound wall. NTPC is requested to confirm the same.	Bidder to refer the revised GLP in issued amendments.
1299.	Tanda	-	-	FGD space identified in GLP	In order to plan the tap off for limestone conveyor from the existing coal conveyor, bidder requests NTPC to provide the conveyor profile from Pent House PH-1 upto Crusher House CH.	Noted. Detailed drawings of existing facilities shall be provided to the successful bidder.
1300.	Tanda	-	-	FGD space identified in GLP	For planning pipe/cable rack from ID fans upto the Space identified for FGD near H2 plant, Bidder requests Owner to provide the layout of area/facilities surrounding H2 plant along with the details of building heights of MCC rooms.	Fenced Area for H2 Building is approx. 45.0 m in N-S direction and 34.0 m in E-W direction, Building height 5.5 m. Detailed drawing shall be provided after award of contract.

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1301.	ME/A	-	-	FGD space identified in GLP	Bidder proposes to use the area identified as Space For Water Treatment Facilities Stage-II for FGD Limestone handling and slurry preparation facility. NTPC is requested to confirm the same.	The space of Water Treatment Facilities is in area identified for Stage-II which cannot be used.
1302.	ME/A	-	-	FGD space identified in GLP	Bidder proposes to use the area south of AWPB & Settling and Surge tank. NTPC is requested to confirm the same.	Bidder to refer Amended GLP being issued separately.
1303.	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes.	For 2x660MW Tanda: Owing to the non-availability of required area & related space constraints, Bidder proposes Owner to exclude the scope / facilities pertaining to receiving limestone through railway rakes from the Scope of Bidder. Accordingly the Bidder scope may include the facilities / scope pertaining to the provision of receiving limestone only through the Trucks. Owner to confirm.	Bidder to refer the revised GLP in issued amendments.
1304.	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.01.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	Bidder proposes to use the existing ESP pipe/cable rack near chimney area for pipe / cable routing for FGD package.	Stipulations, as given under Clause 14.00.00 Sub Section- III-A1 Section -VI, Part-A, shall be complied with w.r.t trestles. -Bidder shall comply with

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						technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1305.	Section VI / Part B / Sub Section I	General		Lara power plant 2x800MW	Request NTPC to furnish Autocad drg no:9548-999-POM-F-001,6D0 (latest revision)	Only PDF provided. Bidder to refer the revised GLP in issued amendments.
1306.	Section VI / Part B / Sub Section I	General		Lara power plant 2x800MW	Space allocated for FGD area is currently occupied by temporary sheds (with brick walls and roofing) and Offices. Bidder requests NTPC to confirm that this identified space shall be available completely clear of any obstructions to the Bidder at the time of awarding of contract.	Bidder to refer the revised GLP in issued amendments.
1307.	Section VI / Part a / Sub Section III	2.01.00	2 of 6	2X800MW LARA-Lime stone handling plant-Lime stone will be received to power plant either through road by trucks and /or through indian railway rakes	For Lara project, three options are available for receiving limestone:- a) By railway rakes b) By road through trucks c) By both railway rakes and road by trucks. Bidder requests Owner to confirm the option that needs to be followed from those mentioned above.	Technical Specifications is clear. Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes. Road unloading facility shall be provided for all the

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						plants under this package. Wherever feasible, railway unloading shall also be provided using existing Wagon Tippler / Track Hopper as detailed out in the Technical Specifications.
1308.				2X800MW LARA - Pipe arrangement drawings	Bidder requests Owner to provide existing Pipe GAD's for all projects for a) ash handling b) Chimney c) aux. boiler area d) CHP Workshop area	Bidder to refer the revised GLP in issued amendments.
1309.	Section VI / Part a / Sub Section III	2.01.00	2 of 6	2X800MW DARLIPALI-Limestone handling plant-Lime stone will be received to power plant either through road by trucks and /or through indian railway rakes	After site visit, bidder understands that in Darlipalli there is no space for bringing limestone through indian railway rakes for storage and conveyance. Hence bidder would like to consider limestone handling only through road by trucks. please confirm.	Technical Specifications is clear. Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes. Road unloading facility shall be provided for all the

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
						plants under this package. Wherever feasible, railway unloading shall also be provided using existing Wagon Tippler / Track Hopper as detailed out in the Technical Specifications.
1310.	Section VI / Part a / Sub Section III	2.01.00	2 of 6	2X800MW DARLIPALI-Limestone handling plant-Lime stone will be received to power plant either through road by trucks and /or through indian railway rakes	Bidder requests Owner to provide additional land in 'SG contractors' area for the purpose of Limestone/ gypsum storage and its auxiliary system. Owner to confirm	Bidder to refer the revised GLP in issued amendments.
1311.	Section VI / Part A/ Sub Section I	1.03.06 Section 6, part-A _{sub} section-1	3 of 19	Low height wet chimney(s) for the project	Bidder requests Owner to provide options for selection of configuration of chimney i.e. single flue or twin flue or triple flue type depending up on number of units in power plant, space availability and absorber location. Owner to confirm.	Single flue or multi flue chimney(s) can be provided by the bidder as per clause 3.14.1, Sub Section IVD, Part-B of section VI.
1312.	Section VI / Part A/ Sub Section 5	5.01	8 of 26	Chimney flue liner shall be of mild steel liner with 2mm cladding.	Bidder requests Owner to allow alternate options of providing FRP or GRP liners in place steel liner with cladding for chimney flue. Owner to confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements under the referred cl.no. 5.01.00.

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1313.	Section VI / Part A/ Sub Section 5	5.02.01	9 of 26	WET Stack study	Bidder requests Owner to provide the list of approved technical institutes / laboratories for carrying out Wet stack study.	Bidder to arrange for the same in compliance to tender specification requirements.
1314.	Section VI / Part A/ Sub Section 5	5.01.00	9 of 26	flue gas velocity(m/s)<18m/s at design point	As per EPRI guidelines(revised wet stack guide) the recommended velocity of flue gas is 16.8m/s for Alloy based liner. Request NTPC to confirm.	Provisions of Technical specification at cl.no. 5.01.00 are clear. Bidder shall comply with the same.
1315.	BARH STPP 3x660 stage I General Layout Plan no. 9558/9560-999- POC-F-001 rev 8			General Layout plan	Kindly furnish the final GLP (latest revision) in Autocad format.	Bidder to refer the revised GLP in issued amendments.
1316.	BARH STPP General Layout Plan no. 9558/9560-999- POC-F-001 rev 8			General Layout plan	Bidder understands that the area allocated as 'Space for FGD' in the plot plan shall be used only for Barh stage I (3 x 660) MW which is part of Lot-1A projects. Owner to confirm.	Bidder to refer Amended GLP being issued separately.

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1317.	BARH				Based on visit to the Site, Bidder understands that the space allocated for FGD near the coal stock area (from 2350E 800S to 3000E 1000S) is being used by other contractors for their laydown and pre-assemblies. Bidder requests NTPC to confirm that this identified space shall be available completely clear of any obstructions to the Bidder at the time of awarding of contract.	Bidder to refer the revised GLP in issued amendments.
1318.	BARH				Bidder understands from Site that few more empty spaces available. Kindly confirm the following additional space are available for FGD. 1) Space ear marked for Aux boiler location (750E 900S) 2) Space near crusher house-I on either side of curved railway track(1400E 800S)	1) Space earmarked for aux boiler cannot be used. 2) Bidder to refer Amended GLP being issued separately.
1319.	BARH				Additional space is required for lime-stone/ gypsum handling systems near the FGD area. Kindly confirm that the 100m wide green belt outside the boundary wall between the Ash silo area of stage 1 and stage 2 (400E to 1000E) can be made available for FGD	Bidder to refer the revised GLP in issued amendments.

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1320.	BARH				Please furnish the coal crusher house G.A. drawings, G.A. of conveyer feeding to crusher house & junction tower before crusher house . This will enable us to plan for tapping towards limestone handling systems.	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.
1321.	BARH				Please furnish the G.A. of conveyer TP2 to TP3, cable trestle and pipe trestle in front of existing chimneys.This will enable us to plan for duct tapping and routing towards Absorber.	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.
1322.	BRBCL Nabigar TPP General Layout Plan no. 0270-999-POC-F-001 rev 7			General Layout plan	Please furnish the coal crusher house G.A. drawings, G.A. of conveyer feeding to crusher house & junction tower before crusher house . This will enable us to plan for tapping towards lime handling systems.	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.
1323.	BRBCL Nabigar TPP 4x250 MW				Please furnish the G.A. of cable trestles, Ash slurry PH and AWPB in front of existing chimneys.This will enable us to plan for duct tapping and routing towards Absorber.	Ash Slurry PH size is approximately 74.5 m in E-W direction and 25.5 m in N-S direction and height is 12.15 m from FGL. AWPB Building size is approximately 37.5 m in E-W direction and 12.5 m in N-S direction and height is

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						12.5 m . AWPB building is surrounded by 5 mtr wide sump on three sides. Detailed drawing shall be provided after award.
						Bidder to refer Table 6 of Sub Section- II-A 11 PROJECT INFORMATION (NABINAGAR TPP) Section –VI Part-A for Pipe/cable trestle drawings.
1324.	BRBCL Nabina-gar TPP 4x250 MW				Kindly confirm the empty space near FGD area between coordinates 600W 1500N to 750W 1450N is available for FGD.	Bidder to refer Amended GLP being issued separately.
1325.	NPGCL Nabina-gar STPP stage I General Layout Plan no. 0370-999-POC-F-001 rev 9				Please furnish the coal crusher house G.A. drawings, G.A. of conveyer feeding to crusher house & junction tower before crusher house . This will enable us to plan for tapping towards lime handling systems.	Noted. Detailed drawings of existing facilities shall be provided to the successful bidder.

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1326.	NPGCL Nabina-gar STPP stage I				In bidders's opinion, the space provided for FGD facilities in the plot plan is inadequate. Additional space is required for lime-stone/ gypsum handling systems. Kindly mark the additional space that can be provided.	Bidder to refer the revised GLP in issued amendments.
1327.	NPGCL Nabina-gar STPP stage I				Please furnish the G.A. of cable trestles, Pipe trestles in front of existing chimneys. This will enable us to plan for duct tapping and routing towards Absorber.	Bidder to refer the revised GLP in issued amendments.
1328.	NPGCL Nabina-gar STPP stage I				Bidder understands from Site that few more empty spaces are available. Kindly confirm the following additional space are available for FGD. 1) Space between ash slurry pipe corridor and conveyor 5A/5B (1500E 1500N to 1550E 1800N) 2) Space near crusher house-I in laydown area (1925E 1350N to 2200E 1800N) 3) Green Belt area adjacent to ESP, chimney and FGD area(1100E 1520N to 1390E 1550N)	1. Bidder to refer Amended GLP being issued separately. 2. Bidder to refer Amended GLP being issued separately. 3. Bidder to refer the revised GLP in issued amendments.

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1329.	General - All Sites				Owner has not furnished any space for the Limestone and gypsum handling system. Please mark the space in the layout and clarify whether space allocated for Phase-II can be utilized for FGD and its auxiliary system.	Bidder to refer the revised GLP in issued amendments.
1330.	General - All Sites				Kindly provide the G.A of conveyors coming from the pent house and also G.A of crusher house building to decide the tapping point of Limestone conveying system.	Noted. Detailed drawings of existing facilities shall be provided with the successful bidder.
1331.	Solapur				Space allocated for booster fan is not marked in the plot plan with the clear dimensions for NPTC - Solapur project. Please mark the clear dimensions provided in front of the chimney and ESP cum VFD control room along the length and width to place booster fan with facilities.	NTPC has identified the available area for FGD. Bidder to propose his own layout(including booster fans etc.) based on site visit and in the identified available space meeting the specification requirement.
1332.	Kudgi				Space allocated for booster fan is not marked in the plot plan with the clear dimensions for NPTC - Kudgi project. Please mark the clear dimensions provided in front of the chimney and ESP cum VFD control room along the length and width to place booster fan with facilities.	NTPC has identified the available area for FGD. Bidder to propose his own layout(including booster fans etc.) based on site visit and in the identified available space meeting the

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						specification requirement.
1333.	Solapur				NTPC - Solapur project -Kindly provide the G.A of conveyor 5A/5B (from TP-4 to TP-5) for in order to route the FGD ducting (from booster fan to Absorber) clearing the conveyor.	Conveyor Bottom Elevation is varying from RL 472.555 m at TP-4 to RL +535.1m at TP-5. Finished Ground Level is at RL +464.25m at TP-4 and RL +461.3m at TP-5. Detailed drawing shall be provided after award of contract.

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1334.	Section VI, Part B, Sub Section IV B	12.00.00	30 of 69	All roads shall be of rigid pavements unless otherwise specified. The design of rigid pavement shall be carried out as per IRC:58	NTPC Solapur & Kudgi - During site visit, it has been observed that existing roads around BTG and BOP areas are flexible pavement (bitumen road) type road. Hence Owner is requested to clarify the following points: a) Wherever existing roads are of bitumen type, the connecting or approach roads to FGD facilities shall be of flexible pavement. Please confirm. b) Existing bitumen road which may be damaged during construction of FGD structures, shall be restored with flexible type pavement.	(a) Bidder shall comply with technical specification requirement. (b) Noted
1335.	Section VI, Part B, Sub Section IV B	21.00.00	41 of 69	RCC paving of minimum 150 mm thick with M25 grade concrete over an undrained as specified shall be provided.	Bidder understands that RCC paving within the BTG area i.e. upto the face of main peripheral road behind chimney shall be Owner's scope. Please confirm.	Extent of paving for FGD facilities shall be in accordance with Technical specification. However, any functional requirement of paving for FGD facilities not specifically mentioned in technical specification is also in the scope of bidder.

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1336.	Section VI, Part A, Sub Section IIA-1	Table 7	38 of 38	Kudgi super thermal power project - General layout Plan Drawing No. 9573-999-POC-F-001, Rev. 6D1	NTPC Kudgi - The allocated space for FGD as shown in the plot plan for locating absorber, fan, tanks etc. may not be sufficient. Hence bidder understands that the space identified for "water treatment plant of stage-II", near IDCT 1A can be utilized for locating Stage-I FGD facilities. Please confirm bidder's understanding.	The space of Water Treatment Facilities is in area identified for Stage-II which cannot be used.
1337.	General - All Sites				a) Bidder proposes to use existing pipe/cable rack structures for FGD pipes and cable. Please confirm. b) Bidder requests Owner to furnish load details of the existing cable & pipe rack structure in BTG and BOP area, so that the same structure can be utilized for supporting FGD pipes and cables.	Stipulations, as given under Clause 14.00.00 Sub Section- III-A1 Section –VI, Part-A, shall be complied with w.r.t trestles. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1338.	SECTION-VI, PART-A/SUB SECTION-III-A6/ZERO LIQUID DISCHARGE SYSTEM	1.01.00	1 of 3	Pre-treatment system consists of FGD waste water storage tank (2X50%) to store waste water.	Owner is requested to clear the discrepancy regarding quantity of FGD waste water storage tank.	The quantity/redundancy of equipment/streams/trains (working & standby) shall be followed as per "technical specification section-

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	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM	3.01.00, C.	7 of 32	FGD waste water storage tank (2X50%)		VI, Part-B sub section-I-M7, zero liquid discharge only. The flow diagram is only showing typical process.
	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	In flow diagram only one FGD waste water collection tank is shown		
1339.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM	3.01.00, C.	7 of 32	FGD waste water tanks (2X50%) shall be designed to store FGD waste water from all units of FGD system operated continuously for 24 hours and GGH washing water which is produced temporarily.	Owner to note that the capacity is calculated based on waste water from all units and average hourly flow of GGH washing water which is produced temporary or intermittently. Owner to confirm.	This shall be decided during detailed engineering based on system requirement and specification requirements.
1340.	SECTION-VI, PART-A/SUB SECTION-III-A6/ZERO LIQUID DIS-	1.01.00	1 of 3	Filter press (2X50%)	Owner is requested to clear the discrepancy regarding quantity of filter press	The quantity/redundancy of equipment/streams/trains (working & standby) shall be followed as per "technical"

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1341.	CHARGE SYSTEM					nical specification section-VI, Part-B sub section-I-M7, zero liquid discharge only. The flow diagram is only showing typical process.
	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	In flow diagram only one Filter press is shown		
	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM	3.01.00, B., 4)	5 of 32	FGD wastewater tank shall be aerated by the aeration devices.	Owner to provide the details of aeration device is to be considered. We propose air scouring blowers for aeration. Owner is requested to confirm.	

The aeration devices shall be as per the proven practice of OEM which shall be decided during detailed engineering.

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1342.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM	3.01.00, B., 12)	6 of 32	The sludge from clarifiers shall be transferred to thickeners and reuse gypsum storage tank. The overflow of thickeners shall be transferred to the FGD waste water tank/pond, and the thickened sludge shall be transferred to the filter press for sludge dewatering and reuse.	Owner to note that thickener is not shown in flow diagram where in technical requirements thickener is considered after sludge sump. Owner is requested to clarify the discrepancy.	Thickner is envisaged in the scope of the Bidder. Process flow diagram is indicative Contractor to furnish the complete scheme & P&ID during detailed engineering meeting the specification requirements.
	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	No thickener		
1343.	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER	SHT-1 of 3	---	Clarifier water/BC feed tank/Filtrate water tank	Owner is requested to provide design basis for Clarifier water/BC feed tank.	Clarifier water/BC feed tank capacity shall residence time, at 100 % level, of no less than 30 minutes.

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	TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)					
1344.	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	Sludge sump	Owner is requested to provide design basis for sludge sump.	This shall be decided during detailed engineering based on system requirement and specification requirements.
1345.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM D. PRE-	3.01.00, D.	7 of 32, 1)	pH adjustment, reaction and coagulation tank	Owner to note that we have considered chemical dosing system (Coagulation, polymer, Lime and Soda Ash dosing system) as shown in flow diagram. The Soda ash shall be dosed only in secondary clarifier only. Owner to confirm. Owner is also requested to provide the	Technical specification requirement is clear. Chemical dosing system shall be as per proven practice of OEM which shall be decided during detailed engineering.

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1346.	TREATMENT SYSTEM				design basis for dosing system for sizing of lime and soda ash dosing tanks and pumps. Also the storage requirement for lime & soda ash is to be confirmed.	
	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	Coagulation dosing system, polymer dosing system, Lime dosing system, Soda Ash dosing system		
	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM D. PRE-	3.01.00, D., 2)	7 of 32	Pre-clarifier/Thickeners	We understand that the primary clarifier is HRSCC type. And Secondary clarifier is Clariflocculator type from flow diagram. Owner is requested to clarify the same.	The Clarifier type shall be as per the proven practice of OEM which shall be decided during detailed engineering.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	TREATMENT SYSTEM					
	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	Primary and secondary clarifier		
1347.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM D. PRE-	3.01.00, D., 1)	7 of 32	pH adjustment, reaction and coagulation tank	We understand that in tender pH adjustment is denoted for lime dosing system and reaction dosing is for Soda ash dosing system. Owner is requested to confirm the same.	Technical specification requirement is clear. Chemical dosing system shall be as per proven practice of OEM which shall be decided during detailed engineering.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1348.	TREATMENT SYSTEM					
	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3	---	Coagulation dosing system, polymer dosing system, Lime dosing system, Soda Ash dosing system		
	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM D. PRE-	3.01.00, D., 2), j)	7 of 32	The contractor shall design the clarifier as follows... - Reaction time : 3-5 hours - Surface loading : 15 - 20 m³/m²/day - Effluent depth : 2-4 m - Linear velocity of driver : 1-2 m/min	Owner is requested to provide type of both primary and secondary clarifier. As mentioned in query number -9 if clarifier are HRSCC type then the surface loading stated in tender is lower side. Owner is requested to provide design basis for both clarifiers (lime surface loading, outlet sludge consistency etc) separately.	Technical specification requirement is clear. Clarifiers shall be as per proven practice of OEM which shall be decided during detailed engineering.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	TREATMENT SYSTEM					
1349.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQ-UID DIS-CHARGE SYSTEM B. GENERAL DESIGN CRITERIA	3.01.00, B., 15)	6 of 32	The softening reactor tanks and softening clarifiers shall be designed for outdoor installation	Owner is requested to confirm whether primary clarifier with sludge facility shall be considered outdoor. Kindly confirm.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
1350.	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR	SHT-1 of 3	---	Flash mixer	Owner is requested to provide the design basis for flash mixer.	Flash mixer shall be as per the proven practice of OEM which shall be decided during detailed engineering.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	ZLD (0011-109-POM-A-005)					
1351.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQ-UID DIS-CHARGE SYSTEM D. PRE-TREATMENT SYSTEM	3.01.00, D), 2), c)	9 of 32	FGD softening clarifier sludge pumps	As per tender, the sludge from softening clarifier shall be transferred to sludge sump via sludge transfer pumps. We propose gravity draining of sludge from secondary/softening clarifier to sludge sump as the sludge sump is adjacent to secondary clarifier. Owner to confirm. The same case for sludge removal from primary clarifier also.	As per Technical specification, Sludge pumps shall transfer sludge from Clarifier to Sludge storage sump/tank. Sludge storage sump/tank is part of FGDWWT system. As such, Sludge pumps for sludge transfer shall be decided by the Bidder based on its offered Sludge sump or Sludge Tank.
1352.	SECTION-VI, PART-A/SUB SECTION-III-A6/ZERO LIQ-UID DIS-CHARGE SYSTEM	1.01.00	1 of 3	Filter press (2X50%)	Owner to provide the design basis for filter press.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1353.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM D. PRE- TREATMENT SYSTEM	3.01.00, D), 1), a)	7 of 32	pH adjustment, reaction and coagulation tank shall be square or rectangular type and installed on the concrete foundation. Tanks shall be equipped partition for smooth mixing of chemicals. Tanks shall be lined with min. 4.8 mm of rubber or equivalent material.	Owner to confirm the material of construction of dosing tanks like lime, Soda Ash. We propose RCC construction with suitable lining. For poly & liquefied PAC dosing non metallic circular tanks are suitable. Owner to confirm.	This shall be decided during detailed engineering as per proven practice of OEM.
1354.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM D. PRE- TREATMENT SYSTEM	3.01.00, D), 1), a)	7 of 32	Chemical dosing systems	The chemical house for zero liquid discharge system shall be two storey. The storage of chemicals shall be provided at ground floor and all dosing tanks and dosing pumps shall be located at first floor. Owner is requested to confirm.	This shall be decided during detailed engineering based on system requirement and specification requirements.

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1355.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM E. EVAPORA- TIVE CONCEN- TRATION	3.01.00, E)	9 of 32	Evaporative concentration	Owner is requested to provide technical datasheet for evaporative concentration (Falling film evaporator) and brine concentrator (crystallizer) along with its design basis.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
1356.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM F. CENTRIFUGE	3.01.00, F)	10 of 32	Centrifuge	Owner is requested to provide the type of centrifuge to be considered. Usually solid bowl type centrifuge is used. Kindly confirm.	This shall be decided during detailed engineering as per proven practice of OEM.
1357.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS-	3.01.00, F)	10 of 32	Centrifuge	Owner is requested to provide design basis and material of construction for centrifuge. Also, please provide design basis for centrate tank.	This shall be decided during detailed engineering as per proven practice of OEM.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	TEM F. CENTRIFUGE					
1358.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM F. CENTRIFUGE	3.01.00, F), 3), 4)	10 of 32	3) Sludge filter press shall be manually and automatically operated. 4) All accessories of centrifuge, filter press shall be provided by the contractor.	As per our understanding, only centrifuge is required as dewatering unit after crystallizer. The filter press is used for dewatering of sludge drained from primary and secondary clarifier. Owner is requested to confirm the understanding.	Confirmed.
1359.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM F. CENTRIFUGE	3.01.00, F), 3), 4)	10 of 32	---	Owner is requested to clarify whether sludge building is to be considered for centrifuge and filter press (for primary and secondary sludge handling system.	This shall be decided during detailed engineering as per proven practice of OEM.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1360.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM G. CHEMICAL FEED EQUIP- MENT	3.01.00, G), 2)	11 of 32	The contractor shall design chemical tanks as followings a) Chemical storage tanks : 15 days b) Chemical dissolving tank : 3 days c) Chemical dosing/injection tank : 24 hours	Owner to note that the chemical storage tanks is applicable for PAC and poly (liquid) only. We shall consider 15 days storage for solid chemical like soda ash and lime. Also, we propose that the dissolving tanks are not necessary to be considered. We may directly prepare solution in chemical dosing/injection tanks. Owner is requested to confirm.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
1361.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM H. WASTE WATER TANK	3.01.00, H)	15 of 32	Waste water tank	Owner is requested to provide design basis of waste water tank like retention time for waste water tank and design basis for pump like hours to emptied out waste water tank.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.

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1362.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM	3.02.05, 3.	23 of 32	The FFE shall be designed for outdoor service with the accessory equipment located indoors.	We understand that except evaporator, all equipment involved in evaporation process like evaporator feed tank, heat exchanger, deaerator, compressor, evaporator seed tank with pump, recirculation pump etc shall be located inside the building. Owner to confirm.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
1363.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM	3.02.06	28 of 32	Crystallizer, crystallizer feed tank, crystallizer brine tank & crystallizer heat exchanger equipment	Bidder requests Owner to provide the retention time for crystallizer feed tank, caustic feed tank, crystallizer distillate tank.	This shall be decided during detailed engineering as per proven practice of OEM.
1364.	SECTION-VI, PART-B/SUB SECTION-I- M7/ZERO LIQ- UID DIS- CHARGE SYS- TEM	3.02.06	28 of 32	Crystallizer, crystallizer feed tank, crystallizer brine tank & crystallizer heat exchanger equipment	Owner is requested to clarify the location of crystallizer with all related equipments/tanks shall be indoor (in building) or outdoor or in shed.	This shall be decided during detailed engineering as per proven practice of OEM.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1365.	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-2 of 3 SHT-3 of 3	---	Antifoam, Antiscalant and anhydrous calcium sulfate	There is no details are available for anti-foam, antiscalant and anhydrous calcium sulfate dosing system for Evaporator/crystallizer. Owner is requested to provide the same.	Technical specification requirement is clear. However antifoam, antiscalant and anhydrous calcium sulfate dosing system for Evaporator/crystallizer shall be as per proven practice of OEM which shall be decided during detailed engineering.
1366.	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3 SHT-2 of 3 SHT-3 of 3	---	The quantity of equipment/shown	We understand that the quantity/redundancy of equipment/shown (working & standby) shall be followed as per "technical specification section-VI, Part-B sub section-I-M7, zero liquid discharge only. The flow diagram is only showing typical process. Owner is requested to confirm.	Confirmed.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1367.	PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT SYSTEM FOR ZLD (0011-109-POM-A-005)	SHT-1 of 3 SHT-2 of 3 SHT-3 of 3	---	---	Owner is requested to provide P&I diagram of FGD waste water treatment system for ZLD for mopenjire clarity.	Process flow diagram is indicative Contractor to furnish the complete scheme & P&ID during detailed engineering meeting the specification requirements.
1368.	SECTION-VI, PART-B/SUB SECTION-I-M7/ZERO LIQUID DISCHARGE SYSTEM	---	---	---	Owner is requested to provide technical datasheet for FGD waste water treatment system for ZLD for more clarity.	Bidder query is not clear. Bidder shall comply technical specification requirement.
1369.	BARH-II-A10 BARH STPP-I GENERAL LAYOUT PLAN - 9558/9560-999-POC-F-001, 8-D0	---	32 of 35	Space for FGD	The location/space is not shown/identified for FGD WWT-ZLD in provided plot plan. Owner is requested to confirm/ identify the same.	Specification requirement is clear.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1370.	MOUDA STPP General Layout Plan no. 9561-999-POC-F-001				Bidder understands that the area marked as 'Space for FGD' in the plot plan shall be used only for Mouda 2 x 660 MW which is part of Lot-1A projects.	Bidder to refer Amended GLP being issued separately.
1371.	Section VI, Part A, Sub Section III-A1 FGD	25.00.01	9 of 9	Wet stack of 150 metre height shall be provided with a stack condensate collection system to avoid the carryover of the condensate/acidic dews/water droplets/Gypsum coming out of the stack. Design of the wet stack condensate system should be such that all the condensate are collected in the stack itself and no water droplet/condensate come out of the chimney and preventing falling of the acidic dews/water droplet/gypsum from the chimney in the plant/nearby area	All of the acidic dew / water droplets which is collected in the stack shall be directly drained to the absorber. No additional condensate collection system shall be provided. NTPC is requested to confirm Bidder's proposal.	Specification requirement is clear. Bidder shall comply with the specification requirements.
1372.	Site Visit: BARH 3x660MW (Stage-1), Nabinagar 3x660MW	-	-	Information as collected during site visit	Bidder understands that for all these three plants, three Station Switchgears (with two bus section in each switchgear) is available in Purchaser's Power House Building & Bidder can consider AHP Feeder from any two switchgears to feed	Refer amended Tender SLD.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	(NPGCL), Kudgi 3x800MW Stage-I				FGD 11KV Switchgear.	
	Electrical Single Line Diagram, Dwg. No. 0011-109-POE-J-001/A-E, Rev. A	-	-	One Common 11KV Switchgear with 2 Incomer & 1 Buscoupler indicated in Key SLD which is applicable all facilities (except Booster Fan motor) of FGDs for all 3 units		
	1373. Site Visit: All plants except Nabinagar (4x250MW & 3x660MW) Plants	-	-	Information as collected during site visit	Bidder understands that for all the plants except Nabinagar (4x250MW & 3x660MW) plants, one no. Spare Motor Feeder & One Spare Transformer feeder is available in Existing 11KV Station Switchgear of each Unit and these spare	Refer amended Tender SLD & Scope. Bidder's understanding regarding modification in Employer's station swgr Incomer & Busbar is correct.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Electrical Single Line Diagram, Dwg. No. 0011-109-POE-J-001/A-E, Rev. A	-	-	Note No. 10: Two Nos. 11 KV Motors per unit can be fed from existing spare feeders in Station Switch Boards. Necessary Augmentation & Modification required in Switchgear Panels for this purpose shall be in scope of Bidder.	feeders will be suitably modified/augmented to suit the requirement of Bidder's 11KV Booster Fan Motors. However Bidder has not envisaged any modification/ upgradation of Purchaser's Incoming & Main Horizontal Busbar of 11KV Station Switchgear as we do not have loading details of Purchaser's 11KV Station Switchgear.	
1374.	Site Visit: BARH 3x660MW (Stage-1), Nabinagar 3x660MW (NPGCL), Kudgi 3x800MW Stage-I	-	-	Information as collected during site visit	Bidder understands that for all these three plants, Separate feeders are available for CHP & AHP HT Transformer in Purchaser's 11KV station Switchgear and Bidder envisages to modify AHP HT Transformer Feeders (NOT CHP Feeders) to feed Bidders 11KV FGD tie Switchgear. Purchaser to confirm/clarify.	Refer amended Tender SLD.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Electrical Single Line Diagram, Dwg. No. 0011-109-POE-J-001/A-E, Rev. A	-	-	Note 11: Panel being used for feeding of CHP/AHP HT transformer shall be suitably modified to DD type for feeding of 11kV FGD tie switchgear CHP/AHP HT transformer shall then inturn be fed from 11 kV Tie switchgear. Necessary cabling upto AHP/CHP transformers shall also be in scope of bidder.		
1375.	Site Visit: Nabinagar 4x250MW Plant	-	-	Information as collected during site visit	As per site data for Nabinagar 4x250MW Plant, there are two nos. of 6.6KV Station Switchgears (with two bus section in each switchgear) for all four Units, with each switchgear having 4 nos. spare feeders (2 motor feeders & 2 transformer feeders). Bidder understands that Booster fan motors for this project will be 6.6KV & all these spare feeders can be used by Bidder. Spare feeders will be suitably modified/augmented to suit the requirement of Bidder's 6.6KV Booster Fan motors. However Bidder has not envisaged any modification/ upgradation of Purchaser's Incomers & Main Horizontal Busbar of 6.6KV Station Switchgear.	Refer amended Tender SLD.
	Electrical Single Line Diagram, Dwg. No. 0011-109-POE-J-001/A-E, Rev. A	-	-	Note No. 10: Two Nos. 11 KV Motors per unit can be fed from existing spare feeders in Station Switch Boards. Necessary Augmentation & Modification required in Switchgear Panels for this purpose shall be in scope of Bidder.		

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1376.	Site Visit: Nabinagar 4x250MW Plant			Information as collected during site visit	Bidder understands that for Nabinagar 4x250MW Plant, Separate 6.6KV feeders available for CHP & AHP HT Transformer in Purchaser's 6.6KV station Switchgear and Bidder envisaged to modify AHP Transformer Feeders (NOT CHP Feeders) to feed Bidders 6.6KV FGD tie Switchgear. Purchaser to confirm/clarify.	Refer amended Tender SLD.
	Electrical Single Line Diagram, Dwg. No. 0011-109-POE-J-001/A-E, Rev. A			Note 11: Panel being used for feeding of CHP/AHP HT transformer shall be suitably modified to DD type for feeding of 11kV FGD tie switchgear CHP/AHP HT transformer shall then inturn be fed from 11 kV Tie switchgear. Necessary cabling upto AHP/CHP transformers shall also be in scope of bidder.		
1377.	Site Visit: Nabinagar 4x250MW Plant			Information as collected during site visit	It is observed that BRBCL plant has 2 Central Control rooms, i.e. CCR-1 for Unit-1 & 2 and CCR-2 for Unit-3 & 4. Bidder understands that FGD OWS to be located in Central Control room, shall be placed in CCR-1, in case of BRBCL plant. Kindly confirm.	Bidder's understanding is not correct. Bidder to refer clause 9.02.00, PART-A Sub Section-III.C, wherein it is mentioned that Control, operation and monitoring of FGD and associated system being provided under the contract is primarily envisaged from Contractor's OWS placed in FGD control room. In addition to above,
	Section-VI PART-E, Tender drawing no. 0000-151-POI-A-013	-	-	FGD PLC OWS in Central Control Room		

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						it is also envisaged to control, operate and monitor FGD and associated system remotely from main plant Central Control Room (CCR). It is further clarified that to achieve the above, FGD OWS shall be located in respective unit section of CCR. For example, in BRBCL project, CCR-1 (for Unit-1 & 2) shall have 04 nos. of FGD OWS - 02 nos. for Unit-1 and 02 nos. for Unit-2. Refer amended tender drawing 0000-151-POI-A-013 in this regard.
1378.	Site Visit: Nabinagar 3 X 660 MW (NPGCL), Kudgi 3x800MW Stage-I			Information as collected during site visit	It is observed that these plants (Nabinagar 3 X 660 MW (NPGCL), Kudgi 3x800MW Stage-I) have 2 Central Control rooms, i.e. CCR-1 for Unit-1 and CCR-2 for Unit-2 & 3. Bidder understands that FGD OWS to be	Bidder's understanding is not correct. Bidder to refer clause 9.02.00, PART-A Sub Section-IIIC, wherein it is mentioned that Control, opera-

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Section-VI PART-E, Tender drawing no. 0000-151-POI-A-013	-	-	FGD PLC OWS in Central Control Room	located in Central Control room, shall be placed in CCR-1, in case of these plants. Kindly confirm.	tion and monitoring of FGD and associated system being provided under the contract is primarily envisaged from Contractor's OWS placed in FGD control room. In addition to above, it is also envisaged to control, operate and monitor FGD and associated system remotely from main plant Central Control Room (CCR). It is further clarified that to achieve the above, FGD OWS shall be located in respective unit section of CCR. For example, in BRBCL project, CCR-1 (for Unit-1 & 2) shall have 04 nos. of FGD OWS - 02 nos. for Unit-1 and 02 nos. for Unit-2. Refer amended tender drawing 0000-151-POI-A-013 in this regard.

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1379.	Section-VI PART-A, Sub- Section-III-C (C&I)	9.01.00	7 of 8	... Contractor shall provide Remote Input Output (RIO) for PLC per unit, placed in Central Equipment Room (CER) for the same...	Bidder understands that UPS and non-UPS power feeders as required for Bidder's FGD OWS to be mounted in Central Control room and FGD PLC Remote I/O Panels to be located in Central Equipment rooms, shall be provided by Purchaser. Kindly confirm.	It is clarified that NTPC shall provide 02 nos. of UPS power feeder per unit from employer's ACDB, for powering FGD OWS located in CCR. Cabling from ACDB to FGD OWS (located in CCR) shall be in bidder's scope of supply. Bidder to refer clause 9.01.00, PART-A Sub Section-III-C, wherein it is mentioned that NTPC shall provide 2 (Two) nos. of 24V DC power supply feeders per unit from employer's DCDB, for powering RIO panel located in CER. Cabling from DCDB to RIO panel (located in CER) shall be in bidder's scope of supply.
	Section-VI PART-E, Tender drawing no. 0000-151-POI-A-013	-	-	FGD PLC OWS in Central Control Room		

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1380.	Section-VI PART-A, Sub- Section-III-C (C&I)	9.01.00	8 of 8	... contractor to consider IOs ... for minimum number of hardwired signal exchange per unit as follows DI - 80, DO - 80, AI - 20 and AO- 20.	Bidder understands that necessary provision in FGD PLC, for hardwired interface between DCS and FGD PLC shall be in Bidder's scope. However, I/O channels, marshalling TBs etc. as required at Purchaser's DCS for the same shall be in Purchaser's scope. Kindly confirm.	Bidder's understanding is correct.
1381.	Section-VI PART-E, Tender drawing no. 0011-109-POE-J-001A/E	-	-	Power feeders for FGD Booster fans	Bidder understands that Power feeder cables for FGD Booster fans can be laid in Purchaser's cable trays (following cable route of ID fans from HT Switchgear room), and no additional trestle/trays are required for the same, till the ID fan location. Kindly confirm.	Refer amended tender SLD. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2.However bidder may visit the project in order to get itself acquainted with existing electrical of plant. GLP of respective plants has already been attached.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1382.	Section-VI PART-E, Tender drawing no. 0011-109-POE-J-001A/E	-	-	Power feeder for FGD HT Switchgear	Bidder understands that Power feeder cables for FGD HT Switchgear can be laid in Purchaser's cable trays (following cable route of AHP/CHP systems from HT Switchgear room), and no additional trestle/trays are required for the same, till the AHP/CHP Switchgear rooms. Kindly confirm.	Refer amended tender SLD. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2.However bidder may visit the project in order to get itself acquainted with existing electrical of plant. GLP of respective plants has already been attached.
1383.	Section-VI PART-E, Tender drawing no. 0011-109-POE-J-001A/E	-	-	Power feeders from FGD HT Switchgear to AHP/CHP HT Switchgears	Bidder understands that CHP/AHP HT Power feeder cables to be fed from FGD HT Switchgear can be laid in existing cable trays routed to CHP/AHP switchgear rooms. Only interconnecting cable trestles/trays as required, to connect the present cable trestle route with Bidder's FGD switchgear room shall be in Bidder's scope. Kindly confirm.	Refer amended tender SLD. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2.However bidder may visit the project in order to get itself acquainted with existing electrical of plant. GLP of respective plants has already been attached.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1384.	Site Visit: Tanda 2x660MW Plant (Stage-II)	-	-		Bidder requests Owner to provide below information for Tanda Project: 1) No of station transformers/ 11 kv station switchgear 2) Existing 11 KV station switchgear SLD from which FGD 11 kv switchgear & booster fan shall be supplied. 3) CCR and CER layout to judge the space availability for FGD R I/O panels, Interface with main Plant DDCIMS, Space for OWS.	1&2. Refer amended Tender SLD & Scope. 3. Space allocation in CER and CCR for RIO and FGD OWS respectively shall be discussed and decided during detailed engineering.
	Tender SLD-electrical single line diagram for FGD package	General notes- 10 & 11	-	Note 10: Two numbers 11 kV Motors per unit can be fed from existing spare feeders in station boards. Necessary Augmentation and modification required in switchgear panels for this purpose shall be in scope of Bidder. Note 11: Panel being used for feeding of CHP/AHP HT transformer shall be suitably modified to DD type for feeding of 11kV FGD tie switchgear CHP/AHP HT transformer shall then inturn be fed from 11 kV Tie switchgear. Necessary cabling upto AHP/CHP transformers shall also be in scope of bidder.		
	Section-VI PART-A, Sub- Section-III-C (C&I)	9.01.00	8 of 8	Hardwired Signal exchange:... Contractor shall provide Remote Input Output (RIO) for PLC per unit, placed in Central Equipment Room (CER) for the same.		

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1385.	Site Visit: Nabinagar 3x660MW (NPGCL)	-	-	Information as collected during site visit	As informed by NTPC site team, only one no. of spare feeder is available in each 11KV Station Switchgear (i.e. one no. spare motor feeder available in SA bus, no spare feeder available in SB bus). NTPC to please advise.	Bidder to refer amended electrical scope for information on feeders identified for use of FGD.
	Electrical Single Line Diagram, Dwg. No. 0011-109-POE-J-001/A-E, Rev. A	-	-	Note No. 10: Two Nos. 11 KV Motors per unit can be fed from existing spare feeders in Station Switch Boards. Necessary Augmentation & Modification required in Switchgear Panels for this purpose shall be in scope of Bidder.		
1386.	SECTION – VI, PART-E / TENDER DRAWING LIST	0011-109-POM-A-002			Bidder considers quantity of limestone slurry pump as following: 1. 4 nos of pumps for 2 units 2. 6 nos of pumps for 3 units 3. 8 nos of pumps for 4 units Please confirm.	Bidders understanding is correct.
1387.	SECTION – VI, PART-E / TENDER DRAWING LIST	0011-109-POM-A-002		Limestone grinding area sump	Bidder considers only Limestone grinding area sump shown in "0011-109-POM-A-002". Please confirm.	Bidder's understanding is correct.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
		0011-109-POM-A-003		Limestone grinding area sump		
1388.	TECHNICAL SPECIFICATION SECTION-YI, PART-A/ SUB-SECTION-VI FUNCTIONAL GUARANTEES & LIQUIDATED DAMAGES	4.02.00	18 of 24	The Contractor guarantees that the maximum purge flow rate to waste water treatment system for the complete plant shall be 10m ³ /hr averaged over a 24 hour period from each unit.	Waste water Purge flow rate of 10m ³ /hr seems to be low. Actual quantity of purge flow rate shall depend on HCl content in flue gas and Cl content in process water of corresponding project. Please confirm.	Bidder shall design its system meeting the waste water treatment system purge flow rate specified.
1389.	TECHNICAL SPECIFICATION SECTION-VI, PART-A SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	6.00.00 note-1	10 of 26	Guaranteed parameters (guarantee on limestone consumption, auxiliary power consumption & gypsum purity) shall be based on available (reactive) CaCO ₃ content of 89%. The design of Flue Gas Desulphurisation (FGD) system & auxiliaries shall be based on available (reactive) CaCO ₃ content of 79%.	Bidder will design the FGD system considering CaO as 51% for guarantee point and CaO as 47% for design point. Please confirm.	Specification requirements are quite clear in the referred clauses. Bidder shall comply with the specification requirements.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1390.						
	TECHNICAL SPECIFICATION SECTION-VI, PART-A SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	6.00.00	10 of 26	LIMESTONE CHARACTERISTICS: CaO: 47-51%		
	SECTION – VI, PART-A / SUB-SECTION-II-A10 Project Information DARLIPALI (2X800 MW)		28 of 30	TABLE-4 Design clarified water analysis	Please provide the amount of suspended solid present in clarified water.	As mentioned in Design Clarified water analysis, Turbidity shall not be more than 10 NTU.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1391.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	6.05.01	22 of 51	iv) Output Fineness Output Fineness 90% or higher (as per the requirement of the absorber) through 325 mesh (for spray tower process) OR 90% or higher (as per the requirement of the absorber) through 200 mesh (for bubbling process)	Bidder understands that for Jet Bubbling process absorber, guarantee of 90% or higher (as per the requirement of the absorber) through 200 mesh (for bubbling process) shall be applicable in line with Technical Specifications. Kindly confirm.	Bidder to refer necessary amendment in this regard.
	TECHNICAL SPECIFICATION SECTION.YI, PART-A/ SUB-SECTION-VI FUNCTIONAL GUARANTEES & LIQUIDATED DAMAGES	4.02.00	17 of 24	90% or higher (as per the requirement of the absorber) through 325 mesh.		

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
1.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	3.01.00	5 of 51	The entire flue gas system, flue gas ducts, absorber etc. shall be designed to meet the following conditions: Design internal pressure at 67% +660 and -150 mmwc or maximum yield strength (mm wc): +660 and -150 mmwc or maximum conceivable head of Booster fan (if provided), whichever is higher	Bidder shall consider the design pressure as +660 and -150 mmwc. Kindly confirm.	Bidder to refer necessary amendment in this regard.
		16.01.03	39 of 51	Duct Design Pressure: All flue gas ducts shall also be designed for ± 660 mm w.g., or maximum conceivable pressure of the relevant fans, whichever is higher at 67% of yield strength of material		
2.	SECTION – VI, PART-A / SUB-SECTION-II-A10 Project Information		28 of 30	TABLE-4 COC: 5-5.5	Bidder shall consider the COC as 5 for all project except "MOUDA" project where COC is considered as 4. Please confirm.	Confirmed.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
3.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	7.07.10	29 of 51	Bucket conveyors shall be provided by the contractor to feed lime to each of the lime storage silos from ground level. The Bucket conveyors shall be sized to completely feed each lime silo within 2hrs.	Bidder understand the bucket conveyor quantity shall be (1Working+1Standby). Please confirm.	Bidder to refer subsection III-A5 of Section VI part A for offering the feeding system to Lime stone day silo
4.	SECTION – VI, PART-B / SUB-SECTION-I-M1 (FGD)	6.05.01 6.05.01-ii	22 of 51 22 of 51	Each mill shall be sized to meet 110% of the maximum limestone requirement of all the units in a project.... Flow: 110% of limestone requirement of two absorbers at Design point	Bidder understands each mill shall be sized to meet 110% of the maximum limestone requirement of all the units in a project.	Bidder's understanding is correct.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
5.	2x800MW GADARWARA TPP	-	-	FGD space identified in GLP	NTPC has identified two areas next to ID fan/Chimney. In bidder's opinion same is not sufficient for accommodation of FGD facilities. Based on site visit by BIDDER on 10.08.2017, additional areas were identified. 1) 70m x 120m north of IDCT 1 and East of WTP area. 2) 35m x 260m north of WTP area in the green belt 3) 30m x 115m north of TP-1 (17565.15N 16781.19E) 4) 45m x 45m south of MCC-1A CONV.1B 5) 50 x 50m south of CONV. 4B 6) 50M X 50M South of HTSWGR+MCC -1B & CHP Control Room. 7) 3 area each 50m x 50m north of coal stock yard south of conv. 12 B 8) 80m x 45m and 45m x 45m south of raw water reservoir and West of MCC-1C.	Bidder to refer the revised GLP in issued amendments.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
					Kindly confirm the same.	

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.01.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	For Gadawara: As per tender terminal point information, all other utility pipe lines (Except process water) shall be tapped off along C row near CD bay rack. Bidder proposes to use client's pipe/cable rack for routing FGD Scope pipes/cables or else these tap offs shall be taken from client's pipe rack which is nearer to proposed FGD package. NTPC is requested to confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.
	2x800MW GADARWARA TPP			FGD space identified in GLP	The area identified by NTPC on either sides of chimney is 25m x 116m. However after site visit, bidder understands availability of 50m x 116m space at the same place. Kindly confirm.	Bidder to refer Amended GLP being issued separately.
	2x800MW GADARWARA TPP				Please provide the latest copy of GLP as bidder observed some additional cable racks running from the C-D bay and parallel to boiler mill, supported on mill columns through cantilevers.	Bidder to refer the revised GLP in issued amendments.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	2x800MW GADARWARA TPP	-	-	FGD space identified in GLP	The identified area is the GLP is not sufficient for the FGD facilities, hence Bidder request NTPC to confirm whether the spaces identified under Laydown area, Temporary storage area for BTG contractors can be used for FGD facilities.	Bidder to refer the revised GLP in issued amendments.
	2x800MW GADARWARA TPP	-	-	FGD space identified in GLP	At the identified location for FGD facilities in GLP, NTPC is requested to provide the area free from any temporary structure (super structure and foundation) and the Land to be graded upto FGL. Kindly confirm.	Bidder to refer the revised GLP in issued amendments.
	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.08.00	2 of 3	FGD waste water pipes shall terminate along with isolation valve at 5 Meters near HCSD Mixing Tank, and 300 mm above FFL in HCSD Silo Area.	For Gadawara: For terminating the waste water pipes near HCSD mixing tanks, bidder proposes to use the existing pipe rack available for routing and supporting the pipes. NTPC is requested to confirm the same.	Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	Limestone received through Indian Railway Rakes will be unloaded in one of the side discharge Wagon Tipplers or Track Hopper of existing Coal Handling Plant (CHP). Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house....	For Gadawara: In order to plan the tap off for limestone conveyor from the existing coal conveyor, bidder request NTPC to provide the conveyor profile from Pent House PH-1 upto Crusher House CH.	Bidder to refer the revised GLP in issued amendments.
	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	Limestone received through Indian Railway Rakes will be unloaded in one of the side discharge Wagon Tipplers or Track Hopper of existing Coal Handling Plant (CHP). Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house....	For Gadawara: Owing to space constraints in most of the projects in Bulk Lot 1A, Bidder proposes to use the existing coal conveyor/s after the Crusher House for conveying the crushed limestone upto the extent possible or nearest area identified for limestone handling / milling building. NTPC is requested to confirm the same	Bidder to refer the revised GLP in issued amendments.
	2x800MW GADARWARA TPP				The pipe rack indicated on the southern side of the chimney in the GLP is not available at site. Kindly let us know whether the same will be constructed at a later stage.	Bidder to refer the revised GLP in issued amendments.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	2x800MW GADARWARA TPP				Bidder understands from the site visit that important/heavy structures are on piles and other lightly loaded and miscellaneous structures are on isolated/raft footing. In view of the same, kindly let us know the foundation preference for the following structures whether its on pile or isolated/raft. 1) Main Absorber 2) Booster fan 3) Duct supporting trestle 4) Pipe racks 5) Lime crusher building 6) Lime storage hoppers and silos 7) Wet ball mill 8) Wet ball mill buildings 9) Lime slurry tanks 10) Process water tanks 11) Gypsum de-watering building 12) FGD control room/ MCC building 13) Conveyor trestles if provided	Bidder to refer the revised GLP in issued amendments.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	2x660 MW MOUDA STAGE - II	-	-	FGD space identified in GLP	NTPC has identified two areas next to ID fan/Chimney. In bidder's opinion same is not sufficient for accommodation of FGD facilities. Based on site visit by BIDDER on 09.08.2017, additional areas were identified. 1) 180m x 160m north-east of O&M stores. This appears to be fenced and permission is requested from NTPC for usage. 2) Triangular area 96m x 104m on the north-west of existing fly ash silos. 3) Traingular area 250m x 220m South-west of existing fly ash silo 4) 75m x 75m north of TP16 and south-west of storage shed for unit assemblies. 5) 100m x 60m west immediately west of Crusher house2 and north of HT switchgear and CHP control room. 6) Complete space for laydown and pre-assembly for stage-II immediately east of Stock pile 6.	Bidder to refer Amended GLP being issued separately.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
					Kindly confirm the same.	

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.01.00	1 of 3	The terminal points identified herein below shall be read in conjunction with the tender drawings, scope of supply and technical specifications of various systems covered under the package.	MOUDA STAGE - II: As per tender terminal point information, all other utility pipe lines (Except process water) shall be tapped off along C row near CD bay rack. Bidder proposes to use client's pipe/cable rack for routing FGD Scope pipes/cables or else these tap offs shall be taken from client's pipe rack which is nearer to proposed FGD package. NTPC is requested to confirm.	Bidder to refer the revised GLP in issued amendments.
	2x660 MW MOUDA STAGE - II			FGD space identified in GLP	The bidder requests NTPC to provide the area immediately east of CT4A for construction laydown of FGD facilities.	Bidder to refer the revised GLP in issued amendments.
	2x660 MW MOUDA STAGE - II			FGD space identified in GLP	Bidder would like to utilise the green belt area immediately outside the boundary of the plant north of space for laydown and way south of Village kumbhari. Kindly confirm.	Bidder to refer the revised GLP in issued amendments.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	2x660 MW MOUDA STAGE - II	-	-	FGD space identified in GLP	The identified area is the GLP is not sufficient for the FGD facilities, hence Bidder request NTPC to confirm whether the spaces identified under Laydown area, Temporary storage area for BTG contractors can be used for FGD facilities.	Bidder to refer the revised GLP in issued amendments.
	2x660 MW MOUDA STAGE - II	-	-	FGD space identified in GLP	At the identified location for FGD facilities in GLP, NTPC is requested to provide the area free from any temporary structure (super structure and foundation) and the Land to be graded upto FGL. Kindly confirm.	Bidder to refer the revised GLP in issued amendments.
	Section VI, Part A, Sub Section IV Terminal Points & Exclusions	1.08.00	2 of 3	FGD waste water pipes shall terminate along with isolation valve at 5 Meters near HCSD Mixing Tank , and 300 mm above FFL in HCSD Silo Area.	MOUDA STAGE - II: For terminating the waste water pipes near HCSD mixing tanks, bidder proposes to use the existing pipe rack available for routing and supporting the pipes. NTPC is requested to confirm the same.	Bidder to refer the revised GLP in issued amendments.

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Sr. No.	Section / Part / Chapter / Volume	Clause No.	Page No.	Bid specification	Bidder's Query	NTPC Clarifications
	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	For Meja stage-1 2x660MW: Limestone received through Indian Railway Rakes will be unloaded in one of the side discharge Wagon Tipplers or Track Hopper of existing Coal Handling Plant (CHP). Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house....	MOUDA STAGE - II In order to plan the tap off for limestone conveyor from the existing coal conveyor, bidder request NTPC to provide the conveyor profile from Pent House PH-1 upto Crusher House CH.	Noted. Detailed drawings of existing facilities shall provided with the successful bidder.
	Section VI, Part A, Sub Section III-A5 Limestone & Gypsum handling plants.	2.01.00	2 of 6	Limestone received through Indian Railway Rakes will be unloaded in one of the side discharge Wagon Tipplers or Track Hopper of existing Coal Handling Plant (CHP). Before existing Crusher house of CHP, the unloaded limestone will be fed to new limestone crusher house....	MOUDA STAGE - II: Owing to space constraints in most of the projects in Bulk Lot 1A, Bidder proposes to use the existing coal conveyor/s after the Crusher House for conveying the crushed limestone upto the extent possible or nearest area identified for limestone handling / milling building. NTPC is requested to confirm the same	Bidder shall comply with technical specification stipulations

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Sl. No.	Volume / Section	Cl. No.	Bid Specification Stipulation	Bidder's query/Stipulation	NTPC Clarifications
	MECHANICAL SYSTEMS				
1416	Section VI, Part A, Sub-Section - IV, Terminal Points & Exclusions	1.09.00 Lime Stone. 1.10.00 Gypsum	i) For Lime Stone unloading WT/Track Hopper of the existing CHP ii) For unloading with Road truck unloading system, enquiry to truck unloading area.	Kindly Furnish Flow Diagram / Layout drawing for limestone unloading, handling and Gypsum storage systems as the same is not attached with tenders drawings.	Bidder may come with proposal based on plant layout available in tender drawings and site visit. NTPC reserves the right to freeze a basic layout for each NTPC plant post commercial bid discussions.
	Section VI, Part A, Sub-Section - IV, Terminal Points & Exclusions	1.10.00 Gypsum	outlet of Gypsum storage silo/shed		
	Section VI, Part A, Sub-Section - II, - A1 to A11, Project Information	Tender Drawings	Tender Drawings - Main plant Layouts	In Main Plant layouts, only space for FGD is marked, bidder request to provide FGD system / equipment layout drawings for more clarity.	NTPC has identified the available area for FGD. Bidder to propose his own layout based on site visit and in the identified available space meeting the specification requirement.
	Section VI, Part E, Tender Drawings	Scheme of FGD Absorber System	Slurry piping & Pumps flushing system	We understand that slurry recirculation pump will be in operation during flushing of recirculation pipe line as capacity of process water pump is very low for full bore flow. Kindly confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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Sl. No.	Volume / Section	Cl. No.	Bid Specification Stipulation	Bidder's query/Stipulation	NTPC Clarifications
	Section VI, Part E, Tender Drawings	Scheme of FGD Absorber System	Scheme of FGD Absorber System	GGH is not considered bidder's scope as same is not indicated in the tender scheme of FGD. Kindly confirm the requirement of GGH.	Bidders consideration is correct.
	Section VI, Part B,	5.06.16	Lining Material and technical applications requirements shall be furnished by manufacturer experienced with similar FGD plants.	Kindly clarify the requirement of alloy material for the inlet duct to the absorber. Further, the extent of alloy material for inlet duct shall be decided during detail engineering by the bidder. Please confirm	Bidder shall provide & select the Lining material as per the NTPC approved fabrication procedures, tests and Quality plan such that it meets the plant operation requirements.
	Section-VI, Part-B, Sub-section-I-M7 - ZLD System	Cl. 3.01.00 (B) (2), Pg. 5 of 32	"The Capacity of FGD WWT Plant for ZLD for Barh-I (3x660 MW) and Nabinagar JV (4x250 MW) shall not be less than 30 m3/hr and 20 m3/hr respectively."	The type of Clarifier is not mentioned. For this capacity, Lamella Clarifier can be considered. Please confirm.	The Clarifier type shall be as per the proven practice of OEM which shall be decided during detailed engineering.
	Section-VI, Part-B, Sub-section-I-M7 - ZLD System	Cl. 3.01.00 (G) (6), Pg. 11 of 32	Coagulant shall use the liquefied PAC.	Organo-Sulphide Dosing is not mentioned,. And shall be decided after award of package, based on sub-supplier recommendation and experience.	Noted.

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Sl. No.	Volume / Section	Cl. No.	Bid Specification Stipulation	Bidder's query/Stipulation	NTPC Clarifications
	Section-VI, Part-B, Sub-section-I-M7 - ZLD System	Cl. 3.01.00 (A), Pg. 3/4 of 32	Brine Concentrator & Crystallizer type	Brine Concentrator & Crystallizer type (including model no.) shall be finalised in DDE Stage based on sub-vendor recommendation. Please confirm.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
	Section-VI, Part-B, Sub-section-A-10-Project In-formation-Barh STPP Stage-I (3x660 MW)	Table-3,4, Pg. 29 of 30	Table for Water Inlet Parameters for FGD ZLD are not provided.	Water Inlet Parameters for FGD ZLD shall be considered as per vendor's past experience substantiated by data from their reference jobs, in DDE stage. However, equipment considered shall remain as specified at this stage.	Technical specification requirement is clear. Bidder shall comply technical specification requirement.
	Section-VI, Part-B, Sub-section-A-11-Project In-formation-Nabinagar TPP (4x250 MW)	Table-3,4, Pg. 25 of 29			

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
	Part A/SUB-SECTION-IV/ Page 2	There are two ways for unloading of limestone-railway or truck.	Please confirm the way for unloading of limestone : 1) by existing CHP system or 2) by unloading with Road-Truck Unloading system.	Technical Specifications is clear. Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes. Road unloading facility shall be provided for all the plants under this package. Wherever feasible, railway unloading shall also be provided using existing Wagon

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
				Tippler / Track Hopper as detailed out in the Technical Specifications.
	SECTION-VI		Please provide the flow chart and general layout of Limestone handling system for reference.	Technical Specifications is clear'. Bidder is to propose the scheme in line with the requirements of technical specifications.
	Part A/SUB-SECTION-V/2.00&3.00	Two tables about flue gas data.	The information of flue gas from MEJA-I 2X660MW has been listed twice in both tables. Please confirm which one is correct?	Bidder to refer necessary amendment in this regard.
	Part B/Sub-section-I-M1/3.02.04	The duct from Absorber outlet to bypass duct shall be made of carbon steel of minimum 7mm thickness with 2mm thickness lining/cladding/wall paper of Alloy C276/Alloy 59 or better material.	As required in the bidding documents, the outlet of the absorber should be connected to the new wet chimney. So we are wondering what the material requirement for the duct between the outlet of absorber to the wet chimney?	Bidder to refer necessary amendment in this regard.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
1392.	Part A/SUB-SECTION-III-A5/2.01.01 & Part B/SUB-SECTION-I-M6	Part A: 2 numbers box feeders/bulk-material receiving unit/underground truck unloading hopper/surface feeder.... Part B: The complete truck unloading system must not have any underground structures/facilities.	Whether the truck unloading system could have underground structure?	Noted. Necessary amendment shall be issued.

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
1393.			The area left for FGD is too small to layout the whole FGD system. So do we have any other area for lime-stone handling?	Bidder to refer the revised GLP in issued amendments.
BIDDING DOCUMENT NO.:	CS-0011-109(1A)-2		Doc No: CS-0011-109(1A)-2-CLRF-TECH-01	Page 619 of 736

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
1394.	Sec-VII (Attachements 3K) /Summery of Critical Equip- ments	Under this clause mentioned that ven- dor/sub vendor have, Designed /Manufactured /Got manufactured and supply at least one no of particular critical equipment type working in Wet Lime- stone based FGD application in Coal Fired Power Plant and which has been in suc- cessful operation for minimum one year	We inquire most of the listed critical equipments manufactured in India but they don't have previous supply- ing experience in Wet Limestone based FGD application pack- age.Please clarify the scope of ex- ception in this reference .	Specification requirement is clear. Bidder shall comply with the specification re- quirements.
1395.	Sec-VI Part B Sub-Section-I-M9 (MDL)/ List of Drawings	NTPC Drawings list	Listed Drawings are not available with existing tender documents .please provides the same.	Specification requirement is clear. Bidder shall comply with the specification re- quirements.
1396.			Please confirm whether the chloride ion concentration in the slurry of absorber tank is specified.	Specification requirement is clear. Bidder shall comply with the specification re- quirements.
1397.			Please confirm the design bounda- ries of limestone crushing and bun- ker feeding system, for the descrip- tion in Part B is not clear. Whether we could consider that all the sys- tem and equipment before truck un- loading system is not in the scope of	Technical specification is clear in this regard. Bidder to refer Sub Section- 4 , Terminal Points & exclu- sions, Section-VI, Part-A.

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
			the bidder. See Part B Sub-Section-I-M6 page 2 of 73 for details.	
1398.	Part A/SUB-SECTION-IV/ Page 2	There are two ways for unloading of limestone-railway or truck.	Please confirm the way for unloading of limestone : 1) by existing CHP system or 2) by unloading with Road-Truck Unloading system.	Technical Specifications is clear. Limestone will be received to power plant either through road by trucks and/or through Indian railway rakes. Road unloading facility shall be provided for all the plants under this package. Wherever feasible, railway unloading shall also be provided using existing Wagon Tippler / Track Hopper as detailed out in the Technical Specifications.
1399.	SECTION-VI		Please provide the flow chart and general layout of Limestone handling system for reference.	Noted. Detailed drawings of existing facilities shall be provided to the successful bidder.

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
1400.			Please confirm whether the new limestone crusher is locating in the space for FGD.	Query is not clear.
1401.			Please confirm the material of the clean gas flue duct and lining if a new built wet stack plan is used.	Specification requirement is clear. Bidder shall comply with the specification requirements.
1402.			Please inform us more information about the T.P of waste water. What HCSD means and where it is located?	Specification requirement is clear. Bidder shall comply with the specification requirements.
1403.			Please confirm the unloading facilities and new limestone crusher will be located in FGD area.	Technical Specifications is clear'. Bidder is to propose the scheme in line with the requirements of technical specifications.
1404.			Please confirm whether the duct from absorber outlet to bypass duct is needed(part-B 3.02.04), and please inform us the material of the duct from absorber outlet to the new wet chimney.	Bidder to refer necessary amendment in this regard.

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SN	Vol/Section/Clause/ Page	Existing Specification	Bidder's Query	NTPC Clarifications
1405.	Sec-VII (Attachements 3K) /Summery of Critical Equip- ments	Under this clause mentioned that ven- dor/sub vendor have, Designed /Manufactured /Got manufactured and supply at least one no of particular critical equipment type working in Wet Lime- stone based FGD application in Coal Fired Power Plant and which has been in suc- cessful operation for minimum one year	We inquire most of the listed critical equipments manufactured in India but they don't have previous supply- ing experience in Wet Limestone based FGD application pack- age.Please clarify the scope of ex- ception in this reference .	Specification requirement is clear. Bidder shall comply with the specification re- quirements.
1406.	Sec-VI Part B Sub-Section-I-M9 (MDL)/ List of Drawings	NTPC Drawings list	Listed Drawings are not available with existing tender documents .please provides the same.	Specification requirement is clear. Bidder shall comply with the specification re- quirements.

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Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 11-08-2017	NTPC Clarifications
	Mechanical						
1407.	TECHNICAL SPECIFICATION SECTION – VI, PART-A	SUB SECTION-III-A1	Page2 of 9	3.01.01	2X100% Limestone storage silos each having minimum 24 hours storage capacity equivalent to the requirements of all the units.	The margin of the redundancy is much more than need. We proposal it should be 12 hrs.	Bidder shall comply with the requirements of Technical Specification.
1408.	TECHNICAL SPECIFICATION SECTION – VI, PART-A	SUB SECTION-III-A1	Page2 of 9	3.01.03	Two (2) limestone slurry tanks, each tank sized to meet 12 hrs total limestone slurry storage requirement for of all the units at Design point, complete with all accessories and Agitator(s).	The margin of the redundancy is much more than need. We proposal it should be 6 hrs.	Bidder shall comply with the requirements of Technical Specification.

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Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 11-08-2017	NTPC Clarifications
1409.	TECHNICAL SPECIFICATION SECTION – VI, PART-B	SUB SECTION-I-M1	Page 17 of 51	5.06.06	Polysulfone or Stainless steel shall be provided...	PP is widely used and proven in China Market, so we suggest use PP as MOC of Mist Eliminator	Bidder shall comply with the requirements of Technical Specification.
1410.	0011-109-POM-A-001				Normal Quench System	Normally only Emergency quench system is there, No quench system would run all the time. Flue gas temperature would automatically drop inside the absorber. We suggest cancel normal quench system	Normal Quench System is not necessary if it is the proven practice of the Bidder.
1411.	0011-109-POM-A-001				FS/TT/AP/TS/PP/TP/PG	Instrument with such abbreviation is not clear, please clarify.	Below are the clarification for the abbreviation: FS: Flow Switch TT: Temperature Transmitter AP: Analyser (test) pocket TS: Temperature Switch PP: Pressure (Test) pocket TP: Temperature (test)

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Sr. No.	Section/Part/Chapter	Sub-Section / Annexure	Page No.	Clause No.	Bid Specification	Bidder's Query Dtd. 11-08-2017	NTPC Clarifications
							pocket PG: Pressure Gauge
1412.	0011-109-POM-A-001				Redundant motor and pneumatic valve before Emergency water tank	We suggest only one motor valve and one pneumatic valve is sufficient for emergency water tank inlet.	Bidder shall comply with the requirements of Technical Specification.
1413.	0011-109-POM-A-001				Density Monitor & pH Analyser	We suggest that density monitor and pH analyzer should not be located right on the absorber. Bidder would do modification as per proven practice.	The location of density monitor and pH analyser shall be as per the bidder's standard and proven practice. The same shall be discussed and decided during detailed engineering.
1414.	0011-109-POM-A-001				Flushing pipe pneumatic valve	Due to flushing point is distributed, instrument air line is difficult to arrange, we suggest all the flushing pipe valve motor driven.	Bidder can provide motor driven flushing pipe valves as per proven practice of the Bidder.

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Sr. No.	Volume/ Chapter	Clause No.	Page No.	Bid Specification	Bidder Clarifications	NTPC Clarifications
1454.	IV	3.14.01	10 of 69	" Chimney shall be reinforced concrete construction. There shall be one flue (liner) for each unit....."	the Bidder shall design according to his knowledge a proper wet stack design, considering EPRI design requirements. The wet stack can be (i) top mounted on the absorber with no additional supporting structure, (ii) top mounted on the absorber with additional supporting structure located around the absorber, (iii) located aside the absorber with a proper supporting structure of the flue pipe. The flue pipe material shall be selected according to Bidders knowledge and experience (FRP, CS lined). The Bidder shall focus on a reliable and economical solution of the wet stack system. Kindly clarify	Bidder shall comply to the requirements of technical specification.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sr. No.	Volume/ Chapter	Clause No.	Page No.	Bid Specification	Bidder Clarifications	NTPC Clarifications
1455.	PART-B-I-MECH.(SUB SEC.-I-M1)	3.02.07	6 OF 51	"...The chimney flue liner cladding shall be made of 2 mm thick Titanium (Grade 2 as per ASME SB265) or C-276 alloy over 8 mm thick (minimum) mild steel base metal flue liner...."	The flue of the wet stack shall be made from FRP or CS with flake lining. The Bidder shall focus on a reliable and economical solution of the wet stack system. Kindly clarify and confirm.	Bidder shall comply with the requirements of Technical Specification.
1456.				Lot 1 A projects	In general most of the plants sufficient space is not sufficient. We request client to give crushed lime stone with (-)20 mm size near FGD area. Kindly clarify and confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements. Also, Bidder to refer the revised GLP in issued amendments.
1457.				General	Kindly give in word format all the technical data sheets, schedules etc. which is to be submitted as part of offer.	Data sheets are all ready part of the Tender document.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
MECHANICAL					
1458.	DWG No: 011-109-POM-A-003		On the discharge of Sump pump for Lime-stone Grinding area Sump NRV is envisaged	As these pump are expected to handle leakoff slurry, pump shall be provided without NRV on pump discharge	Bidder shall comply with the specification requirement.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1459.	DWG No: 011-109-POM-A-002 & DWG No: 011-109-POM-A-003		Discharge of Sump Pump for Limestone Grinding Area Sump	As per DWG No: 011-109-POM-A-002 discharge of Sump Pump for Limestone Grinding Area Sump to be taken to Limestone Slurry Storage Tank Whereas as per DWG No: 011-109-POM-A-003 same is to be taken to Absorbent tank. Owner to clarify discrepancy.	Discharge of Sump Pump for Limestone Grinding Area Sump shall be taken to Limestone Slurry Storage Tank.
1460.	DWG No: 011-109-POM-A-003		Level Control Station For Tank	We understand common Level control station to be provided for both process water tanks. Owner to confirm.	Bidders understanding is correct.
1461.	Section-VI/ PART-A /Sub section-III, 1.04.00	1 of 5	Paints & Painting	It is to be noted that some of the equipments/ systems are being imported. In International market, RAL or BS color coding is being adopted for specifying colors. In view of this RAL & BS color coding system is to be allowed	Noted. Will be dealt as per tender technical specifications.
1462.	Section-VI/ PART-A /Sub section-III, 1.04.00	2 of 5	Paints & Painting	For ducts and surfaces wherever Insulation is being used painting specification as per Sr. no (i) and (ii) shall only be used.	Bidders query is not clear.
1463.	Section-VI/ PART-A /Sub section-III,A1, 2.04.00	2 of 9	 Contractor shall terminate the Flue Gas Duct (at a suitable point on the common flue gas duct to Chimney- upstream of the chimney terminal point and outside the chimney)	We understand common flue gas duct upto existing chimney shall be provided by owner. FGD contractor shall supply & Erect bypass dampers & instruments on this duct. Owner to confirm	Bidders understanding is correct.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
				firm.	
1464.	Section-VI/ PART-A /Sub section-V, 2.0.00 & 3.00.00	3 of 26 & 3 of 26	Guarantee Point & Design Point Data	In both clausd 2.00.00 & 3.00.00 Meja -I, 2X660MW power project is mentioned. Please clarify which data is to be considred for MEJA-I Power plant.	Refer necessary amendment in this regard.
1465.	Section-VI/ PART-A /Sub section-III,A1, 6.01.00	5 of 9	Employer shall provide a common Auxiliary Absorbent tank, common for all the units, of sufficient capacity for storage of absorber slurry of one unit.	Clarify scope & Location of Auxiliary absorbent tank	For scope, Refer necessary amendment in this regard. Regarding location , Bidder to finalize the same based on the Bidder site visit , revised GLP and system design.
1466.	VI, Part-A, Sub-Section-IV1.00.00	1 of 3	Terminal Point	Isolation valve at terminal point for , Potable water DM water, Clarified water, Fire water & Instrument & Service air shall be provided by owner.Owner to clarify	Isolation valve at terminal point for , Potable water DM water, Clarified water, Fire water & Instrument & Service air shall be provided by the FGD Contractor.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1467.	Section-VI/ PART-A /Sub section-IV- 1.02.00	1 of 3	Terminal point: One tapping from the common flue gas duct going towards the existing chimney (in case of twin flue chimney)	i) As per this clause it one tapping from common flue gas duct is envisaged for FGD tapping However as per drawing 0011-109-POM-A-101, two nos are tapping are envisaged from each ID fan discharge duct for FGD tapping. NTPC to clarify for twin flue chimney what shall be tapping point. ii) In case tapping is from common duct NTPC to clarify whether isolation damper is required at tapping point Or Not.	One tapping from the common flue gas duct going towards the existing chimney is to be taken for FGD. Isolation Gate is to be provided by the FGD Contractor.
1468.	Section-VI/ PART-A /Sub section-IV- 2.00.00	3 of 3	Exclusions	Please provide list of Exclusions.	The scope for FGD is on complete EPC basis and is specified in the Technical Specifications.
1469.	Section-VI/ PART-A /Sub section-III- A4	1 of 3	Hot secondary water pipe from the PHE's, discharging into the FGD System as process water	i) As such requirement of secondary cooling water shall be very small, In view of this NTPC to clarify whether entire process water tapped from blowdown line is to be passed through ECW system PHE or only partial flow as per system requirement can be passed through PHE. ii) Process water may be used before OR after process water storage tank as per layout requirement.	i) Specification requirement is clear under the referred Sub section-III-A4. Bidder shall comply with the specification requirements. ii) Bidder shall select accordingly offer his design meeting the layout & specification requirements.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1470.	Section-VI/ PART-A /Sub section-III- A5,1.02.02	3 of 6	NTPC reserves the right to freeze a basic layout for each NTPC plant post techno commercial discussions.	We understand NTPC will provide finalized basic layout before submission of commercial bid & it will be provided to bidders well in advance before submission of commercial bid. Please clarify.	Technical Specifications is clear. NTPC reserves the right to freeze a basic layout for Limestone and Gypsum handling for each NTPC plant post techno-commercial discussions as specified in the subject clause.
1471.	Section-VI/ PART-A /Sub section-III- 1.06.00	3 of 5	All the first fill and one years topping requirements of consumables such as grease, oil lubricants servo fluid etc. which will be.....	i) We understand this one year topping requirement includes, toppings required during commissioning, trial runs, initial operation etc. ii) We understand consumables required for maintenance of equipment of equipment are to be supplied. Chemical required for the process are excluded from bidders scope. NTPC to clarify.	i) Specification requirement is clear under the referred cl.no. 1.06.00. Bidder shall comply with the specification requirements. ii) Except Limestone, other chemicals required shall be in Bidder's scope.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1472.	Section-VI/ PART-B/Sub section-I- M1- 2.00.0	5 of 51	 Complete installation of liners shall be made under supervision of the liner supplier as per their guidelines.....	Liners used in the FGD system are standard lines & shall be installed as per standard guidelines of manufactures without supervision of supplier.	Bidder shall comply with the requirement of Technical Specification.
1473.	Section-VI/ PART-B /Sub section-I- M1-3.01.0, Sr. No-2	5 of 51	The Entire Flue Gas system , Flue Gas Ducts, Absorber shall be designed to meet following conditions : Sr. No 2 : Design Inlet Gas Temp : 150 deg.	We understand design inlet gas temp to absorber is 150 deg.. Please clarify.	Specification requirements are clear in this regard.
1474.	Section-VI/ PART-B /Sub section-I- M1-3.01.0, Sr. No-2	5 of 51	The Entire Flue Gas system, Flue Gas Ducts, Absorber shall be designed to meet following conditions : Sr. No 1 : Design Internal pressure at 67% yield strength : +660 & -150 mmwc or Maximum conceivable head of booster fan , Whichever is higher.	As per clause no 16.01.03 , all the flue gas duct shall be designed for +/- 660mmwc or maximum conceivable pressure of the relevant fan..... NTPC to clarify design pressure on -ve side to be considered for duct design.	Refer necessary amendment in this regard.
1475.	Section-VI/ PART-B /Sub section-I- M1-3.02.04	5 of 51	The duct to absorber inlet shall be made of carbon steel of minimum 7mm thickness. The duct , from Absorber outlet to bypass duct shall be made of carbon steel of minimum 7mm thickness with 2mm(minimum) thickness lining / cladding / wallpaper of alloy C276/Alloy 59 or better material.	It is to note that as Absorber outlet is connected to dedicated chimney, there is no connection from absorber outlet to bypass duct & requirement indicated for absorber outlet to bypass duct is not relevant. NTPC to clarify.	Refer necessary amendment in this regard.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1476.	Section-VI/ PART-B /Sub section-I- M1-3.03.07	7 of 51	Quick acting biplane damper shall be provided by the contractor..... The damper shall be capable of quick opening during emergency condition within a time of 10-20sec. Bidder should indicate the required opening time for	i) As quick opening biplane damper is to be provided, Guillotine gate damper will be redundant, in view of this it is proposed to provide only quick opening biplane damper in bypass duct. ii) In case if bypass guillotine gate type damper is to be provided in the existing duct. It is proposed that opening time of biplane damper shall be same as that of guillotine gate type of damper.	Bidder shall comply with the requirement of Technical Specification. The opening time of guillotine gate can be more than that of quick opening biplane damper.
1477.	Section-VI/ PART-B /Sub section-I- M1-3.03.09	7 of 51	The dampers shall be pneumatically operated and controlled from the control room.....	As per P&ID 0011-109-POM-A-001(a) , Guillotine gate type dampers are to be provided with motorised actuator.NTPC to clarify discrepancies in the type of actuator to be provided	This is a general clause. Bidder to however refer the subject tender P&ID for the type of drives on gates/dampers.
1478.	Section-VI/ PART-B /Sub section-I- M1-4.01.00-(iv) & 4.02.00-(viii)	9 of 51 & 10 of 51	Gas Temp (Deg C) = 150	We understand this is the temperature of the gas being handled by Booster fan including temperature rise in the booster fan.	Bidder's understanding is correct.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1479.	Section-VI/ PART-B/Sub section-I- M1- 7.08.01	29 of 51	 It should be possible to discharge the each absorber into the emergency drain tank within 2 hrs.	As per present scheme envisaged in the technical specification Gypsum bleed pump shall be utilized for emptying of absorber tank. Capacity of this pump will not be adequate to transfer entire slurry in absorber tank within 2 hours. If entire absorber tank slurry is to be transferred within 2 hours then separate pumps are to be provided for this purpose. NTPC to review & clarify.	Specification requirement is clear. Bidder shall comply with the specification requirements.
1480.	Section-VI/ PART-A /Sub section-VI- 5.00.00-xiii	21 of 24	xiii)Auxiliary Cooling (Normally working)water pump set one (1) to supply cooling water on secondary side of the PHE.....	In case if discharge of booster pump is passed through PHE then separate Auxiliary Cooling water pump shall not be used therefore , power consumption of Auxiliary Cooling water will not applicable in this case..	All working Booster / FGD Auxiliary (secondary) cooling water pumps shall be considered for calculation of power consumption. May please refer amendment.
1481.	Section-VI/ PART-A /Sub section-VI- 7.00.00	23 of 24	The contractor shall guarantee 98% availability of FGD plant including..... For a continuous period of 120 days. An availability guarantee test shall be conducted to assure this level of availability for a period of 240 days as per the procedure below.	Please clarify if availability test is for 120 days Or 240 days.	Specification requirement is clear. Bidder shall comply with the specification requirements.
1482.	Section-VI/ PART-B /Sub section-I- M1-5.06.18-(i)	20 of 51	The last spray level upstream the mist eliminator shall be operated only in counter-flow	In DW Tower also known as Liquid Column Desulfurization Tower liquid column shall be injected from bottom i.e. in co-current fashion. This is a standard proven design for FGD absorber.	The requirement is applicable for spray tower design. In case, Bidder other design the same shall be discussed with the bidder during post bid meeting after submission of techno-commercial bid.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
				Owner is requested to modify this clause accordingly.	
1483.	Section-VI/ PART-A /Sub section-V- 5.01.00	8 of 26	 The chimney flue liner cladding shall be made of 2mm thick Titanium(Grade 2 as per ASME SB265) Or C276 alloy over 8mm thick (minimum) mild steel base metal of flue lines.....	It is proposed to provide borosilicate block lining for the chimney flue. NTPC is requested to allow for Borosilicate lining for the chimney.	Bidder to refer necessary amendment in this regard.
1484.	Section-VI/ PART-A /Sub section-VII			Not applicable line items shall not be provided by bidder, if same are not applicable in bidder's design/ Supplied Equipment. Owner to confirm bidder understanding is correct.	Bidder shall comply with the requirements of Technical Specification.
1485.	VI, Part-C 30.00.00	42 of 83	Noise Level:- shall not exceed 85 dBA. However Ball Mills the noise levels as per following shall also be acceptable: a) Ball Mill < 90 dBA	i) As per clause no 9.01.00, Sr. No-6, on page no 21 of 26, Section VI, Part-A, Sub Section V, Noise level for Air Compressor is 90 dB. ii) It is proposed that noise level for Crusher shall be < 102 dBA Owner to clarify.	please refer amendment in this regard.
1486.	General FGD Area Layout		Pipes & Cables	Owner to provide routings of existing pipes & cables which may be laid in the allocated area for FGD system.	Bidder to refer list of drawings provided at of Sub Section- II- PROJECT INFORMATION (For Various Projects) Section – VI, Part-A for pipe/cable trestle drawings.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1487.	General FGD Area Layout		Pipe Rack / Trestle	Contractor shall use employers pipe rack/trestle to support their pipes and cable trays from employer TP point location to FGD area.Owner to confirm bidder understanding is correct.	Stipulations, as given under Clause 14.00.00 Sub Section- III-A1 Section –VI, Part-A, shall be complied with w.r.t trestles. -Bidder shall comply with technical specification requirement clause no: - 1.08.00.2 Sub Section- III-B, Section –VI, Part-A.
1488.	General		ID fan Performance Curves	Owner to provide ID fan performance Curve.	Noted. ID fan performance Curve will be provided to the successful bidder.
1489.	General		Code & Standard	As equipment may be procurent from China, i) Equivalent GB standard shall be followed for Design of equipment of FGD System like structure, pumps, supports etc. ii) Material shall be as per equivalent Chinese code.	Specification requirement is clear. Bidder shall comply with the specification requirements.
MECHANICAL-Water System					
1490.	SECTION – VI, PART-A SUB-SECTION- III-A1 FGD CL 1.03.00	1 of 9	The contractor's scope shall include,,, common limestone grinding system...	A common limestone, unloading, storage, grinding, slurrification and dosing system for FGD and ZLD systems is proposed . This would reduce footprint and contain capital costs. Please clarify & confirm.	Specification requirement is clear at CL 1.03.00. Bidder shall comply with the specification requirements.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1491.	SECTION – VI, PART-A SUB-SECTION-III-A6 ZLD Cl 1.01.00	1 of 3	Pre treatment system shall consist of FGD waste water storage tank (2x50%) to store FGD waste water, GGH washing water, etc	Bidder proposes 1x100% tank sized for 30 m3/h inflow (Barh-I) and 20 m3/h inflow (Nabinagar) instead of 2x50% tanks, this will facilitate the operation flexibility. Please confirm. Also please clarify all the waste water sources leading to ZLD, such process wastes, cooling water wastes, if any.	Stipulations of technical specification is clear. As mentioned in Cl. No. 1.01.00, Sub-section IIIA-6, Part-A, Bidder shall provide Pre-treatment system consisting of 2x50% FGD waste water storage tank for storing FGD wastewater, GGH washing water etc. As such, any waste water as envisaged by Bidder shall be considered while designing the Waste storage tank.
1492.	SECTION – VI, PART-A SUB-SECTION-III-A6 ZLD Cl 1.02.00	1 of 3	Contractor shall provide one independent train (1x100%) or two independent trains (2x50%) of Evaporative concentration system.	Bidder proposed to provide 1x100% Evaporative Concentration System. Please confirm.	Specification requirement is clear under the referred cl.no. 1.02.00 . Bidder shall comply with the specification requirements.
1493.	SECTION – VI, PART-A SUB-SECTION-IV Terminal Points & Exclusions Cl 1.08.00	2 of 3	FGD waste water pipes shall terminate allong with isolation valve at 5 meters near HCSD mixing tank	We presume this is not applicable in Barh & Nabinagar since ZLD is provided. Please clarify.	Bidders understanding is correct.
1494.	SECTION – VI, PART-A SUB-SECTION-IV Functional Guarantees & LD Cl 4.02.00	18 of 24	Waste Water: The contractor guarantees that the maximum purge flow rate to waste water treatment system for the complete plant shall be 10 m3/h averaged over a 24 hour period for each unit.	Please clarify whether the guaranteed purge quantity mentioned as 10 m3/h per unit is common for all the projects. Please clarify the exact flow rate to be considered for designing the ZLD.	Bidder to refer necessary amendment in this regard.

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1495.	SECTION – VI, PART-ASUB- SECTION-III- A6ZLD CI 1.02.00	1 of 3	Contractor shall provide one independent train (1x100%) or two independent trains (2x50%) of Evaporative concentration system.	Bidder proposes the hybrid ZLD system. The system comprising of Primary secondary clarifiers followed by 2X50% streams of UF & RO system. Further reject will be fed into the downstream consisting of evaporator and crystalliser as in NTPC specification with reduced capacities. The proposed system is technoeconomical & proven system. This type of scheme is already proposed in FGD system by leading consultants of India. Please review & reply.	Bidder shall comply with Technical specification requirement.
1496.	SECTION – VI, PART-C General Technical Requirements CI 30.00.00	42 of 83	Noise levels <85 dBA for FGD equipment and <90 dBA for Ball Mills	Please clarify the acceptance of noise levels for ZLD equipment - near field & far field.	Bidder shall comply with Technical specification requirement in Section VI part-C.
1497.	SECTION – VI, PART-B SUB-SECTION-I-M7 ZLD CI 2.00.00	3 of 32	Conditions of Service - 'All Design Pressure of all device, piping, and auxiliary facilities... Device and tank maximum allowance: operating pressure x 1.5' and also 'piping and auxiliary facilities: 150 lb class flange, STD wall pipe'	This may not apply for larger "fit for service" equipment like Evaporators and Crystallizers. The same will be based on manufacturer recommendations on design pressures for piping and tanks based on proven experience in the past executed project. Please confirm.	Technical specification requirement is clear. However, proven practice of OEM is also acceptable which shall be decided during detailed engineering.

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1498.	SECTION – VI, PART-B SUB-SECTION-I- M7 ZLD CI E2	9 of 32	Evaporative concentrator shall be designed to start / stop every day	Please clarify the requirement, it is presumed that FGD & ZLD will operate at full capacity continuously.	Bidder shall comply Technical specification requirement.
1499.	SECTION – VI, PART-B SUB-SECTION-I- M7 ZLD CI E6	9 of 32	Pressure vessel in evaporative concentration shall be designed as per ASME Sec VIII or equivalent code listed above.	Evaporator is typically not a pressure vessel and not necessarily designed as per ASME Sec VIII. Kindly accept the manufacture standard practice.	Technical specification requirement is clear. Any pressure vessel in evaporative concentration shall be designed as per ASME Sec VIII or equivalent code. However, for evaporator, proven design and experience meeting provenness criteria specified in tender is acceptable.
1500.	SECTION – VI, PART-B SUB-SECTION-I- M7 ZLD CI E14	10 of 32	Hoists shall be provided for all vessels in evaporative concentration system as per the Manufacturer's proven practice	Manufacturer recommended practice will be followed for handling / maintenance. Please confirm.	Technical specification requirement is clear. However, proven practice of handling and maintenance of OEM is also acceptable which shall be decided during detailed engineering.
1501.	SECTION – VI, PART-B SUB-SECTION-I- M7 ZLD CI E15	10 of 32	Vessel support shall be designed same as materials for vessel. Different material cannot be welded to vessel.	Manufacturer proven practice of providing the supports of same/different material as the vessel will be followed. Please confirm.	Vessel support arrangement as per proven practice of OEM is also acceptable which shall be finalized during detail engineering.
1502.	SECTION – VI, PART-B SUB-SECTION-I- M7 ZLD CI F2	10 of 32	Centrifuge to dehydrate solids form evaporative concentration shall be consist of Centrifuge 2x50%	Centrifuge does not 'dehydrate solids' it makes wet cake or solids suitable for landfill. Please review & confirm,	Bidder's query is not clear. Bidder shall comply Technical specification requirements.

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1503.	SECTION – VI, PART-B SUB-SECTION-I-I- M7 ZLD CI 22d	14 of 32	Size: 1/2%-inchOD minimum	As per the manufacture standard , minimum suction size is 1/4" OD tube. Kindly accept the same.	This shall be finalized during detail engineering.
1504.	SECTION – VI, PART-B SUB-SECTION-I-I- M7 ZLD CI 3.02.01(4)	15 of 32	...the contractor shall provide duplicate pumps (2x100%) or multiple standby pumps for the same service.	Duplicate pumps are not needed for all pumps. As per the OEM recommendation the applicable connected redundancies and store standbys are considered.Please confirm.	Redundancy with store standby of Pumps as per the proven practice of OEM is also acceptable which shall be decided during detailed engineering.
1505.	SECTION – VI, PART-B SUB-SECTION-I-I- M7 ZLD CI 3.02.03 (2)	20 of 32	Slurry tanks shall be provided with screen at the inlet nozzles.	It is proposed to follow as per the manufacturer standard practice. Screens if required will be provided to protect downstream equipment (such as heat exchangers) as per the proven experience. Please confirm.	Technical specification requirement is clear. However, proven practice of screens for slurry tanks of OEM is also acceptable which shall be decided during detailed engineering.
1506.	SECTION – VI, PART-B SUB-SECTION-I-I- M7 ZLD CI 3.02.05 (6)	20 of 32	Additional required equipment for Vapour Compressor : i) Shaft driven lube oil pump	As per the OEM/manufacturer electrically driven lube oil pump is proposed instead of shaft driven due to limitations in design of certain compressor manufacturers. Please confirm.	Electrically driven lube oil pumps as per the proven practice of OEM is also acceptable which shall be decided during detailed engineering.
1507.	Process Flow Diagram ZLD	3 of 3		The scheme shows steam driven crystallizer, whereas write up calls for MVR. Please clarify.	As mentioned in Cl. No. 2.00.00 D, Sub-section I-M7, Part-B, Auxiliary steam if required shall be provided by owner for start-up condition only. For continuous duty, Bidder to design

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1508.	SECTION – VI, PART-A SUB-SECTION- IIA-A10 PRO- JECT INFOR- MATION BARH STPP STAGE-I (3X660)	18 of 30 & 28 of 30	Cooling water Analysis Table 4: Clarified water analysis	The cooling water analysis & table 4 clarified water analysis are contradictory. The COC mentioned cooling water analysis is 2.5, COC 5-5.5 was mentioned in table 4. Bidder is following the Table 4 water analysis & COC as 5-5.5. Please confirm.	the various systems considering power driven equipment and the same shall be considered in power guarantee. Confirmed. Bidder to follow the Table 4 water analysis & COC as 5-5.5.
1509.	SECTION – VI, PART-A SUB-SECTION- III-A6 ZLD Cl 1.04.00 i)	3 of 3	All first fill & One year topping requirement of consumable such as chemicals, grese....etc	It is proposed to provide the chemicals till commissioning & handing over of the plant. The Three(3) months chemicals at rated capacity are considered for the proposal. Please confirm.	Bidder shall comply with Technical specification requirement.
1510.	SECTION – VI, PART-A SUB-SECTION- III-A6 ZLD Cl 1.01.00	1 of 3	Sludge dewatering etc	Sludge dewatering followed by sludge/cake disposal shall be by client. Please confirm.	Technical specification requirement is clear at Cl 1.01.00. Bidder shall comply with Technical specification requirement.

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1511.	SECTION – VI, PART-A SUB-SECTION-I INTENT OF SPECIFICATION CL 4.04.00 & 4.05.00	15 of 19 & 16 of 19	Route-1, Route 2 & provenness criteria for critical equipments....	The main qualifying requirements are mentioned in Route-1 & Route-2. Additionally provenness criteria for critical equipments are indicated in the clause for evaporator, crystalliser etc. It is proposed to consider either of the two qualifying/provenness criteria is applicable. Also the equipment application shall not be restricted to only coal fired power plant. As wide application implementation in process industries may be considered for evaluation.	Bidder to refer clarifications being issued separately.
MECHANICAL-Material Handling System					
1512.	Technical Specification, Section-VI, Part-A, Sub-section-III-A3, Fire Fighting System, Clause no:1.00.00	Page 1 of 2	Fire water shall be tapped off from Existing Fire Water main header for Hydrant and Spray system.	It is requested to mark the terminal point in Plant layout drawing.	Terminal point for Hydrant and Spray Header shall be furnished during detailed engg. However for details, Bidder to refer Cl. No 1.11.00 , sub-section -IV, Part A of Technical Specification, Section VI.
1513.	Technical Specification, Section-VI, Part-A, Sub-section-III-A3, Fire Fighting System, Clause no:1.00.00(point no 1.1.1.1.2.1.3)	Page 1 of 2	Fire water shall be tapped off from Existing Fire Water main header for Hydrant and Spray system.	Owner is requested to provide the pressure available at terminal point for both Hydrant & Spray system.	Bidder to refer Cl. No 1.11.00 , sub-section -IV, Part A of Technical Specification, Section VI.

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1514.	Technical Specification, Section-VI, Part-A, Sub-section-III-A3, Fire Fighting System, Clause no: 1.00.00 (point no 1.2, 1.3) & Technical Specification, Section-VI, Part-B, Sub-section-I-M4, Fire Fighting System, Clause no: 3.01.00	Page 1 of 18	Fire water shall be tapped off from Existing Fire Water main header for Spray system. & Spray System shall be provided with Spray Pump.	We will design the Spray system considering the tapping point from existing system. Necessary Orifice shall be provided (if required). No Spray pump has been considered. Please confirm.	Noted
1515.	Technical Specification, Section-VI, Part-A, Sub-section-V, Salient Design Data & Sizing, Clause no: 8.02.00	Page 18 of 26	The Pipelines routed in RCC Trenched shall be provided with Coating & wrapping.	As per practice Coating & wrapping is not required for the pipes which is laid in the trench and open to Air. Outside paint for the pipe shall be provided. Owner is requested to confirm.	Bidder shall comply specification requirement.
1516.	Technical Specification, Section-VI, Part-A, Sub-section-	Page 18 of 26	The Pipelines routed in RCC Trenched shall be provided with Coating & wrapping.	It is proposed to provide pedestal instead of Trench. Wherever pedestal is not possible, Trench will be provided. Please confirm.	Meaning of the referred clause is amply clear. Query asked is not related to the referred clause.

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	V, Salient Design Data & Sizing, Clause no: 8.02.00				
1517.	Technical Specification, Section-VI, Part-B, Sub-section-I-M6, LHP, Clause no: 3.2.00	Page 2 of 73	Limestone shall be conveyed using same conveyors as for coal before being taken to dedicated limestone crusher house.	We are not considered Fire Fighting system for Existing Conveyor for LHP. If Additional conveyor or any modification will be done for FGD system, Fire fighting System will be provided for that additional system only. Please confirm.	Confirmed.
1518.				R-Infra consider the various areas which are mentioned in the Plot plan dedicated for FGD system. No other area has been considered by us. Owner to confirm.	Confirmed.
1519.				Owner is requested to provide the scope and terminal point for Service Air, Instrument Air, Service Water for FGD system.	Specification requirements are clear. Bidder shall comply with the specification requirements.
1520.	Section-VI, Part-B, Sub-section-I-M6, Clause No. 4.10.0	140 of 274	Vibrating feeder shall be of electromechanical type and shall be provided to feed limestone to crusher. While in same sub-section-I-M6, Clause No. 3.3.0, page 129 of 274 two (2) numbers of Vibrating grizzly/screening feeders.	Please clarify whether we shall consider vibrating feeder or Vibrating grizzly/screening feeder.	Vibrating screening feeder shall be considered for limestone crusher house. Necessary amendment shall be issued.

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1521.	General			Please provide existing Coal flow diagram and transfer tower AS built GA drawings before crusher (editable copy) for preparing new layout for Lime Stone handling System.	General Layout Plan of the plants is already given in the tender documents. Other drawings like Coal Flow Diagram and Transfer Tower GA, if required, shall be provided to successful bidders.
1522.	General			What shall be the belt conveyor system capacity, belt width and belt speed to be selected. Please clarify.	Rated capacity for belt conveyor system taking feed from existing CHP shall be 1200 TPH. However, for road truck unloading system rating of belt conveyor system shall be 150 TPH. Necessary amendment shall be issued.
1523.	Part-B, Volume VI, Sub Section-I-M, FGD system Clause 6.06.01	Page 24 of 51	For tank volume calculation, solid concentration (by weight) in the slurry shall be assumed, not more than 20% or actual required whichever is lower.	Please allow the concentration to be decided by vendor as per their technology for overall optimization.	Bidder shall comply with the requirements of Technical Specifications.
1524.	Part-B, Volume VI, Sub Section-I-M, FGD system Clause 6.02.05	Page 21 of 51	For dust free operation each silo should be provided with a covering arrangement and a self cleaning bag filter system of suitable capacity containing blower, automatic/on-load cleaning system, etc	Considering the clean air requirement for bag purging, we recommend for Instrument air to be used for cleaning of bags of bag filters in place of blower. Please relook into the requirement of blower and confirm.	Bidder shall comply with the requirements of Technical Specifications.
C&I					

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1527.	Section-VI, Part-A, Sub Section-III-C, Cl: 6.00.00	6 of 8	Control System	Bidder proposed to provide common PLC (hot redundant) for each Project FGD along with required number of unitized/ common RIO cabinets at CER, gypsum handling, Limestone handling system etc meeting all functional and parametric requirements of the specification. Owner may please confirm concurrence	It is clarified that binary and modulating controls of complete Flue gas desulphurization system, associated material handling systems etc. and other systems being provided under the contract shall be implemented in PLC. The PLC based Control System shall have separate process blocks for unitised system and one process block for common system including material handling system. For example in KUDGI-I (3x800MW) , the PLC based control system shall have following process blocks:(i) Unit-1 FGD and associated system(ii) Unit-2 FGD and associated system(iii) Unit-3 FGD and associated system(iv) Common system including material handling systems.Refer amendment in this regard.Remote Input Output (RIO) panel, located in respective unit (s) CER, for hardwired signal exchange between FGD PLC and BOP DDCMIS of respective unit shall be provided on per unit basis.
1528.	Section-VI, Part-A, Sub Section-III-C, Cl: 6.01.00	6 of 8	Dual processor based PLC system with PC based OWS, programmable station and A4 size color laser printer etc on as required basis (to be decided during detail engineering)	It is understood that OWS, EWS cum OWS, printer are to be provided in line with PLC configuration diagram (0000-151-POI-A-013) and not "on as required basis".	Bidder's understanding is not correct. Bidder to refer clause 6.01.00, PART-A, Sub Section-III-C, where in it is mentioned that Operator Work Station (OWS) shall be supplied on as required

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				Owner may please confirm concurrence	basis (to be decided during detail Engineering) for controlling and monitoring of the FGD and associated system being provided under the contract located in FGD control room. One OWS shall also be provided with capabilities of programming station of PLC and Human Machine Interface system (EWS cum OWS). However, bidder to consider minimum quantity of OWS and OWS cum EWS as follows: a) OWS (placed in FGD control room)-(N+1) where N is the total number of generating units per project under this package. b) OWS cum EWS (placed in FGD control room)-ONE (1) c) OWS (placed in central control room of each generating unit)-TWO (2). Bidder to refer amendment in this regard.

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1529.	Section-VI, Part-A, Sub Section-III-C, Cl: 6.05.00	6 of 8	The minimum quantity of furniture per unit envisaged in FGD control room is as: a) Chairs- 4nos b) Printer Table- 1no c) Computer Table- 2nos - e) Locker set - 1 no	The following is understood from the Tender documents: 1) Computer Table is asked in scope of supply, however no specification for computer table is provided and instead specification of Control desk is indicated at III C-5, which is not applicable as per scope. It is understood that computer table is to be provided as per standard practice of OEM. 2) As common control room is envisaged for each project, it is understood that the quantity of furniture indicated is common for all units of each project. 3) Provision for mounting FGD OWS in Owner's CCR (i.e.Computer table/ space in Owner's existing desk) shall be provided by Owner. Owner may please confirm concurrence to above Understanding of the Bidder.	1) It is clarified that control desk meeting specification requirements stipulated in clause 10.04.00, PART-B, Sub Section III-C5 of technical specification is in the scope of bidder. Refer amendment in this regard. As per specification clause 6.05.00, PART-A Sub section IIIC, computer table is also in the scope of bidder and the same shall be supplied as per bidder's standard and proven practice. 2) Bidder's understanding is not correct. It is clarified that the quantity of furniture mentioned in clause 6.05.00 a) to e) is on per unit basis. For example: In case of MOUDA-II (2x660MW) project, the quantity of furniture to be supplied shall be twice of the furniture quantity that is mentioned under clause 6.05.00 a) to e), Part-A, Sub Section III-C of the specification. Bidder shall comply with the specification. 3) Bidder's understanding is correct.
1530.	Section-VI, Part-A, Sub Section-III-C, Cl: 6.07.00	7 of 8	Power Supply System- 24VDC and UPS	Owner may please clarify the following:1) As no specific requirement is indicated for power supply of RIO cabinets, it is proposed to extend the power supply from FGD control room	1) Bidder to refer clause 9.01.00, PART-A Sub Section-IIIC, wherein it is mentioned that NTPC shall provide 2 (Two) nos. of 24V DC power supply feeders per unit from employer's DCDB, for

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				to the nearby RIO cabinets. 2) Requirement Power supply feeder for Bidder's scope FGD OWS coming inside Owner's CCR shall be provided by Owner. Owner may please confirm concurrence	powering RIO panel located in CER. Cabling from DCDB to RIO panel (located in CER) shall be in bidder's scope of supply. 2) It is clarified that NTPC shall provide 02 nos. of UPS power feeder per unit from employer's ACDB, for powering FGD OWS located in CCR. Cabling from ACDB to FGD OWS (located in CCR) shall be in bidder's scope of supply.
1531.	Section-VI, Part-A, Sub Section-III-C, Cl: 9.02.00 & Section-VI, Part-B, III-C1, Basic design Criteria, Cl: 3.05.01	8 of 8 & 3 of 4	It is also envisaged to control, operate and monitor FGD and associated system remotely from main plant CCR through ethernet link following TCP/IP standard. & Further, flue gas desulphurization system, link shall be provided for collection of data in DDCMIS (in Employer's Scope)	As separate FGD OWS is envisaged in CCR, it is understood that communication link from bidder FGD control system to Employer's DDCMIS is to be provided only for monitoring of FGD system through Owner DDCMIS, i.e. no control/ operation from Owner's DDCMIS. Owner may please confirm.	Bidder's understanding is correct. Bidder to refer clause 9.02.00, PART-A, Sub Section IIIC wherein it is mentioned that it is also envisaged to control, operate and monitor FGD and associated system remotely from main plant Central Control Room (CCR). To achieve the above the Contractor shall provide the following: 1) The FGD plant operation shall be made available through Ethernet link following TCP/IP standard. The system shall be OPC compliant. Bidder shall comply with the above specification requirement. It is further clarified that to achieve the above FGD OWS shall be located in respective unit (s) CCR. Refer amended

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					tender drawing 0000-151-POI-A-013 in this regard.
1532.	Section-VI, Part-A, Sub Section-VII		Mandatory Spares	Mandatory spares for Control and instrumentation are indicated under various mechanical packages (at Cl: 1.19.00, 1.21.00, 1.22.00, 1.23.00, 1.24.00) and then again at Cl: 1.25.00 and hence causing repetition of same spares at different clauses. In view of the same, it is proposed to provide mandatory spares for all supplied C&I items in line with Cl: 1.25.00 only to avoid confusion. Owner may please confirm.	Refer amendment in this regard.
1533.	Section-VI, Part-A, Sub Section-III-A2, Cl: 2.00.00 g)	2 of 4	Contractor shall provide microprocessor/ PLC/ GIU based control system for control and monitoring of ventilation system as per manufacturer's standard practice.	Bidder proposes to provide relay based control system for ventilation system in line with standard and proven practice of OEM. Owner may please confirm.	The bidder's proposal is not acceptable. Bidder shall comply with Technical specification requirements.

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1534.	Section-VI, Part-A, Sub Section-III-A6	1 to 3 of 3	General	As no requirement for control system is specified, it is proposed to provide integral control system for ZLD in line with OEM standard and proven practice. Further, separate OWS of ZLD inside FGD control room shall be provided with serial interface with FGD PLC system for monitoring of ZLD system .Owner to confirm concurrence.	Bidder's understanding is not correct. Bidder to refer clause 1.00.00 a), PART-A Sub Section IIIC wherein it is mentioned that the Contractor shall provide Independent Control & Instrumentation system for control, monitoring and operation of associated drives and auxiliaries in FGD system including Limestone grinding & handling system, Gypsum Dewatering & handling system, Zero liquid discharge system (ZLD) (if provided) and other systems being provided under the contract, in all regimes of operation in safe and most efficient manner.
1535.	Section-VI, Part-B, III-C1, Basic design Criteria, Cl: 3.04.00	3 of 4	In any case, Bidder shall be required to ensure the supply of spare parts for lifetime if the plant.....	With respect to control & instrumentation, the bidder shall support supply of spare parts for a period of 15 years, in view of the fast changing technology in the field of C&I. Owner may please confirm.	With reference to clause 3.04.00, Part-B, Sub Section III-C1 of technical specification, it is clarified that lifetime of the plant is envisaged as 15 years for which bidder shall ensure supply of the spare parts. Bidder shall comply with the specification.
1536.	Section-VI, Part-B, III-C2, Measuring Instruments, Cl: 10.00.00, S.No-8	19 of 34 & 23 of 34	Under Common requirements for analyzer Instruments, it is specified that calibration from Remote is required.	Bidder clarifies that the Auto & Manual calibration from local is envisaged for bidder supplied analyzers. Owner may please confirm.	Bidder's understanding is not correct. Specification requirement are clear. Bidder shall comply with the specification requirement.

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	& Cl: 11.01.00, S.No-8				
1537.	Section-VI, Part-B, III-C5, PLC Based Control System, Cl: 9.02.01	18 of 27	Racks for Batteries of PLC system	As no specification is provided for battery racks, it is proposed to provide battery rack in 2 step/ 2 tier configuration in line with standard practice for Ni-Cd batteries being followed in all major utilities. Owner may please confirm concurrence.	Bidder's proposal is acceptable.
1538.	Section-VI, Part-B, III-C5, PLC Based Control System, Cl: 16.00.00	26 & 27 of 27	Annual Maintenance Contract for PLC	As AMC for PLC is not indicated in Part-A, it is presumed that the same is not in the scope of Bidder. Owner may please confirm. However, in case AMC for PLC is to be included in his scope by the bidder, then Owner may please clarify the scope of services to be provided by bidder during "hardware support" period.	Bidder's understanding is not correct. It is clarified that AMC for PLC is in the scope of Bidder. Bidder to refer amendment in this regard.

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1539.	Section-VI, Part-E, Drawing no: 0011-109-POMI-A-001 and 001 (a)	1 of 1	Typical scheme for blower and slurry recirculation pumps	From the tender drawing, following is understood:1. Vibration Transmitters (2 nos i.e. one in X and one in Y direction) are to be provided at drive end of HT motor and Fan/ Pump only, i.e. 4 nos. transmitters per HT drive/ motor combination.2. Temperature Element is to be provided at drive end of motor and Fan/ Pump only. Due to space constraint only, one no. duplex element is proposed per bearing, i.e. total two nos. Duplex Temperature elements per HT drive/ motor combination. Owner may please confirm.	It is clarified that in the tender P&ID minimum quantity of field instruments to be supplied by the contractor, is indicated. However, bidder to also refer the relevant clauses of specification for the quantity of vibration transmitters and Temperature elements for motor and Fan/pump.
1540.	Section-VI, Part-E, Drawing no: 0011-109-POMI-A-001 and 001 (a)	1 of 1	P&ID for FGD- Absorber System	Requirement of Flow indicator (local indication) at absorber Inlet and outlet duct as per tender P&ID is proposed to be met with local display in electronic transmitter provided for flow measurement. Owner may please confirm concurrence.	Bidder's proposal is also acceptable.
ELECTRICAL					

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1541.	Part- B-II Elect 1 clause no 2.01.01 Technical re- quirement	3 of 7	Adequate number of Auxiliary transformer shall be provided to meet the demand on 11KV, 3.3 KV and 415V system under most onerous conditions, with the criteria that each 11KV/3.3KV/415V switchgear /MCC/DB shall be fed by 2x100% or 3x50%, 3x100% transformer / feeders and these shall be rated to carry the maximum load expected to be imposed.	M/s NTPC is requested to furnish the criteria for selection of 3x100% Transformer /feeder arrangement.	3X100% Transformers Shall not be required in any area. Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1542.	Drawing no 0011-109-POE-J-001/A-E Single line diagram		11 KV Switchgear	M/s NTPC is requested to confirm whether 11KV Tie Switchgear is same as 11 KV FGD Switchgear.	Confirmed.
1543.	Drawing no 0011-109-POE-J-001/A-E Single line diagram		Existing CHP/AHP system	Please specify the number and ratings of the existing CHP/AHP Transformers and its distance from the 11KV FGD Switchgear room.	Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1544.	Part- B-II Elect 1 1.11.00 Technical re- quirement	2 of 7	In fire hazardous areas like gas/liquid fuel storage/handling areas lighting fixtures, switchgears shall be flame proof	The Switchgear for the Areas being referred to, are normally located in a separate Room, hence non flame proof switchgear can be proposed .M/s NTPC to confirm acceptance.	Equipment located in fire hazardous areas shall be flame proof. In case switchgear located in non-hazardous areas need not be flame proof.
1545.	Part- B-II Elect 1 clause no 2.01.01 Technical re-	4 of 7	All ACDBs ,DCDBs,Solenoid Valve DBs and MCC on travelling trippers shall be fixed module type. All 415 V Circuit breaker modules and other MCC modules shall be	We understand from the Bid Clause that All ACDBs ,DCDBs,Solenoid Valve DBs shall be fixed type.M/s NTPC to confirm .	Confirmed.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
	quirement		fully draw out type.		
1546.	Part- B-II Elect 1 clause no 2.04.00 Technic al requirement	4 of 7	All MV & LV circuit breakers shall be provided with Communicable Numerical Relays----. These relays shall be integrated with Employers Switchgear SCADA through Ethernet switches (to be supplied by Employer) mounted on each switchgear.	1)It is again requested to reconfirm following as per technical specifications :i. All the 11 KV/3.3KV & LT Incoming , Ties, Bus couplers , Transformer feeders shall be controlled from Switchgear SCADA and also from DDCMIS.ii. The Switchgear SCADA shall be supplied by Employer 2) M/s NTPC is requested to provide the Location of Switchgear SCADA . 3) M/s NTPC to confirm the scope of cabling between Ethernet Switches & SCADA.	This clause is deleted. Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1547.	Part- B-II Elect 1 clause no 7.00.00 Technical requirement	7 of 7	Equipment through Fault withstand capabilities under worst operating conditions duly taking into account negative tolerances on transformer and maximum fault levels of source etc. shall be as follows----- -----.	M/s NTPC It is requested to provide the through fault with stand capabilities criteria for incoming cables to 11/0.433 KV Switchgear.	Please refer Technical Specifications.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1548.	Part- B-II Elect 2 clause no 2.01.05 & 3.02.05 Technical requirement	2 & 5	The Cable vault / Cable spreader room space below the HT/LT switchgear room, control room, Unit control equipment----- Cable Trenches shall be provided only in Switchgear/MCC rooms	It is proposed to provide cable trenches as per cl no 3.02.05 in Switchgear room. No Cable vault / Cable spreader is considered for Switchgear room.M/s NTPC to confirm acceptance.	Bidder to provide the same as per their standard practice complying with technical specification
1549.	Part- B-II Elect 1 clause no 7.00.09 Technical requirement	4	SIC termination kit shall be suitable for fault level of 25KA for 0.17 sec	It is requested to reconfirm the fault level for Termination Kit.	Confirmed.
1550.	Part- A Elect 1 Subsection-IIIB Electrical System/Equipment clause no 1.08.00 Technical requirement	2 of 6	Contractor scope shall include laying of cable from employer board ---- on the employers nearest trestle in the FGD Area subject to availability of space & suitability. In case of non availability of space in employer trestle , contractor shall make necessary arrangement for cable tray erection & cable laying	Due to space constraint ,It is not feasible to construct a new trestle from Main Plant Area for FGD System cabling. Hence existing Trestle shall have to be utilized for cabling to FGD Switchgear from Main plant. M/s NTPC is requested to undertake the exercise to create the space in existing trestle for FGD cabling .	Bidder shall comply with technical specification CL no:- 1.08.00.2. In case of non availability of space in employers trestle, bidder shall make necessary arrangements for cable tray erection and laying. However bidder may visit the project in order to get itself acquainted with existing electrical of plant.
CIVIL					
1551.	SUB SECTION-II-A10-PROJECT INFORMATION-BARH-I 3X660 MW	30	List of Drawings, SI No-2(Topographical Survey Drawing) & SI. No-3(Equipment Layout Plan) are missing.	NTPC to submit the soft copies(Autocad drawing) of missing drawings.	Owner provide's PDF file only.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1552.	SUB-SECTION-II-A8 PROJECT INFORMATION- NABINAGAR-I 3X660 MW	-	Topographical survey drawing is missing	NTPC to submit the soft copies(Autocad drawing) of topographical survey drawings.	Owner provide's PDF file only.
1553.	SUB-SECTION-II-A8 PROJECT INFORMATION- NABINAGAR-I 3X660 MW MW_Clause No:6.00.00	9	SITE SPECIFIC DESIGN PARAMETERS: The various design parameters, as defined in IS: 875 (Part-3), to be adopted for the project site shall be as follows: a) The basic wind speed "Vb" at ten	NTPC to furnish basic wind speed "Vb" at 10m height above the mean ground level.	The basic wind speed "Vb" at 10m height above the mean ground level for "NABINAGAR-I 3X660 MW" project shall be 47 metres/second. Also refer Amendment issued separately in this regard.
1554.	SUB-SECTION-II-A8 PROJECT INFORMATION- NABINAGAR-I 3X660 MW MW_Clause No:7.08.00_SR-g_Item No-2	21	2) In view of the above, the following shall be adopted for all foundations and sub-structures,	Item description is incomplete.	Query is not clear.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1555.	SUB-SECTION-II-A3,A4,A6,A7 & A11 PROJECT INFORMATION-	-	Bore log details for following projects are missing, 1. Solapur STPP, Stage-II (2x660MW), 2. Gadarwara STPP, Stage-I (2x800MW), 3. Nabinagar TPP (4x250 MW), 4. DARPALLI STPP, Stage-I (2X800 MW), 5. Tanda STPP, Stage-II (2x660MW)	NTPC to furnish the borelog details of missing project.	For Borelog details, bidder may refer Project information chapter furnished in Technical Specification for Gadarwara STPP, Nabinagar TPP and Tanda STPP. Further, Bidder may also refer amendment no.1 for Darlipalli STPP, Meja and Solapur STPP.
1556.	SECTION -VI TECHNICAL SPECIFICATION, Clause: 4.02.00	18	The scope for foul water from toilets shall include layout and laying of sewers up to the Employer's main sewer line for sewerage system together with all fittings and fixtures and inclusive of ancillary works such as connections, manholes and inspection chambers within the building and from the building to the Employer's sewer line.	NTPC to furnish the existing Sewer layout drawing.	Drawing shall be provided after award of work.

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S.No	Clause No	Page No.	Description of Bid Document	Bidders Queries/Suggestions	NTPC Clarifications
1557.	SECTION -VI TECHNICAL SPECIFICATION, Clause: 4.02.00, Clause: 21.00.00, Clause: 15.00.00	29,41,32	Clause: 4.02.00-For sewerage below ground stoneware pipes conforming to 18: 651 with concrete bedding and haunch. Clause: 21.00.00-Sewer lines (Cast Iron), interconnected by sewer manholes (RCC) at regular intervals (not exceeding 30 meter centre to centre) shall be provided to dispose off sewage from FGD area to the nearest available manhole of the owner. Clause: 15.00.00-Cement concrete pipes of class NP-3 as per 18:458 shall be used below ground level for sewage disposal in all areas.	NTPC to confirm the type of pipe to be used for sewage disposal.	Refer amendment issued separately.
1558.	SECTION - VITECHNICAL SPECIFICATION, Clause: 12.00.00	30	Specification pertaining to road shoulder(shoulder width, subgrade materials used and their thickness) is missing.	NTPC to furnish the shoulder specification.	Refer amendment issued separately.
1559.	SECTION -VI TECHNICAL SPECIFICATION, Clause: 15.00.00	32	Sewage pump house shall be provided as per IS:4111.	NTPC to furnish the sewage pump house specification.	Refer amendment issued separately.

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S.No	Section/Part/Chapter	Clause No.	Page No.	Statement of subject	Clarification	NTPC Clarifications
1560.	PART-E	drawing no.0011-109-POE-J-001/A-E	53	CHP/AHP HT switchgear shall then inturn be fed from 11kV tie switchgear.	Please provide the total loads of 11 kV AHP/CHP SWGR. And whether all AHP/CHP SWGR of 11 projects need feeders shall be two? Especially 3 boilers and 4 boilers Please fill in data sheet 1	Details for feeders proposed to be used for FGD system have included in AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1561.	PART-E	drawing no.0011-109-POE-J-001/A-E	53		Please clarify that the 11/0.433 kV transformers of the FGD whether shall be used dry type instead of oil immersed type.	Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1562.	PART-E	drawing no.0011-109-POE-J-001/A-E	53		Please clarify that whether all projects shall be provided two number 11kV motor like the booster fan per unit from existing spare feeders in station boards.	Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1563.	PART-B-II-ELECT-3	SUB-SECTION-II-E10 LT SWTIGCHGE AR & LT BUSDUCT 32.00.00 light-ing/welding transform-ers	32	Each AC Lighting Distribution Board (LDB) shall be fed from 415V / 415V, 50kVA(minimum) isolating transformer & Each Welding Distribution Board (LDB) shall be fed from 415V /415V, 100kVA isolating transformer. The lighting / welding transformer may, preferably, be located inside the LDB / Welding DB panel itself.	Please clarify that whether the lighting/welding transformers could be canceled in FGD area, , considered the lighting and welding loads,there is no need to set the separate lighting/welding transformers. The power of the lighting DBs and Welding DBs can be provided by the PC/MCC nearby.	Bidders to follow Technical Specifications.

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S.No	Section/Part/Chapter	Clause No.	Page No.	Statement of subject	Clarification	NTPC Clarifications
1564.	PART-E	Part A sub-section I intent of specification	6	note: all the above drawings are indicative of employer's requirements to enable the bidder to make a suitable offer.....	Please clarify whether or not can we choose the electrical single line scheme case by case, or we can only obey the reference FGD electrical single line diagram for all the case. According to the electrical loads, the reference single line diagram is not the most reasonable or economic scheme.	Please refer AMENDMENT NO TO TECHNICAL SPECIFICATION (SECTION VI).
1565.	PART-B-II-ELECT-3	SUB-SECTION-II-E11 DIESEL GENERATORS 4.05.00		The DG Set shall be located inside the acoustic enclosure and kept outdoors.	The DG Set shall be located inside the acoustic enclosure and kept indoors.	Technical Specifications are clear. Bidder shall comply with technical specification requirements.
1566.	PART-B-II-ELECT-3	SUB SECTION-II-E9 HT SWITCH-GEAR 1.00.00 DE-SIGN CRITERIA FOR MV SWITCH-GEARS	2	all MV Switchboards is provided with one spare motor feeder and one transformer feeder on each section for future requirements.	please provide the total loads of the 11kV spare feeders.	This clause is deleted. Please refer AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI).
1567.	I&C					

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S.No	Section/Part/Chapter	Clause No.	Page No.	Statement of subject	Clarification	NTPC Clarifications
1568.					Please clarify the quantities of Operator Work Station(OWS), Engineering Work Station(EWS) and the Historical Storage & Retrieval Station(HSRS) for FGD control and operation per unit, including those furnished in FGD control room and in main plant CCR	Bidder's understanding is correct. Amendment will be issued in this regard.
1569.					FGD-PLC system shall be time synchronized with master clock system. Please provide the interface of the owner's master clock system with FGD-PLC.	Different station has different master clock system. Accordingly, the interface requirement shall be discussed and finalised with respective successful bidders during detail engg.
1570.	PART-A,SUB-SECTION-III-C (C&I)	2.02.00	2/8	Single Input DIN rail mounting type temp transmitters (mounted in JB's) shall be provided by the Contractor for all temperature elements under Contractor's scope.	Please clarify whether Resistance Temperature Detector shall be hardwired up to RTD input module of FGD-PLC instead of temperature transmitter as per the standard and proven practice of the Contractor. If not, please clarify whether temperature transmitters can be centralized in PLC cabinets other than local arrangement.	Bidder to follow specification requirement.
1571.					Please clarify whether FGD OWS in main plant CCR be of remote communication type, linked via redundant OFCs from FGD-PLC network.	OWS in main plant CCR will be of the same configuration with respect to hardware, OS, application software and license as that of the OWS in FGD control room. Further bidder to refer to clause no. 9.02.00

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S.No	Section/Part/Chapter	Clause No.	Page No.	Statement of subject	Clarification	NTPC Clarifications
1572.						of Sub Section-III-C of Part A of specification.
1573.	CIVIL					
1574.	PART B				Please clarify the tender GLP drawings cover all exiting buildings and structures in the planning space.	Bidder to refer the amended GLP.
1575.	PART B				Are there some exiting buildings and structures in the planning space for FGD needed to be removed? If there were, was the removal work under the Contractor's scope, or under the Owner's scope?	
1576.	PART B				When the planning space for FGD is not enough, if the contractor could chose another fit and spare space for FGD.	Bidder to refer the revised GLP in issued amendments.
1577.	PART B				Please provide groundwater annual water level elevation and quality of groudwater, and its corrosion possibility to concrete and steel underground.	Bidder to refer the revised GLP in issued amendments.
1578.	ME/JA-II-A9-2 Meja GLP				Please provide the planning space for FGD.	Query is not clear.
1579.	DARLIPAL-LI-II-A4-1 PROJECT INFOR-				Please provide BORE LOG in or adjacent to the planning space for FGD.	Bidder to refer necessary amendment.

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S.No	Section/Part/Chapter	Clause No.	Page No.	Statement of subject	Clarification	NTPC Clarifications
	MATION					
1580.	SOLAPUR-II-A6-1 PROJECT INFORMATION				Please provide BORE LOG in or adjacent to the planning space for FGD.	Bidder to refer necessary amendment.
1581.	PART B				Please clarify the structures types of all kinds of sturcture for FGD	Type of Building structure (RCC/ Steel), if not specified in the technical Specification shall be decided by the bidder considering the functional requirement, schedule of construction and site constraints (if any).

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section /Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1582.	Section-VI Part-A Sub Sec-I / Intent of Specification	3.00.00	4 of 19	The scope and terminal points of the equipment to be furnished under this steam generator package shall be as identified in these drawings and read in conjunction with text of the specification	"Steam Generator Package" mentioned in the clause is considered as typo and it shall be replaced with "FGD System Package". NTPC to confirm.	"Steam Generator Package" should be read as "Flue Gas Desulphurisation System Package"

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1583.	Section-VI Part-A Sub Sec-V / Salient Design Data & Sizing	1.00.00 (7)	1 of 26	The Flue Gas Desulphurisation (FGD) System for Kudgi-I 3X800 MW, Lara-I 2X800 MW, Gad-arwara-I 2X800 MW & Darlipal-I-I 2X800 MW... Flue Gas Composition at FGD system inlet at Design Point: (i) O₂ (% v/v wet) : 6.115 (ii) CO₂ (% v/v wet) : 10.501 (iii) H₂O (% v/v wet): 3.958 (iv) SO₂ (% v/v wet): 0.065 (v) N₂ (% v/v wet) : 69.362	Summation of flue gas composition is not equal to 100. It is presumed H ₂ O (% v/v wet) is 13.957 instead of 3.958. NTPC to confirm.	Refer necessary amendment in this regard.
1584.	Section-VI Part-A Sub Sec-V / Salient Design Data & Sizing	2.00.00	3 of 26	The Flue Gas Desulphurisation (FGD) System for Mouda-II 2X660 MW, Tanda-II 2X660 MW, Nabinagar-I 3X660 MW, Meja-I 2X660 MW & Barh-I 3X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point'...	Since, Meja-I 2 x 660 MW is mentioned in both the clauses of Salient Design Data, NTPC to clarify the design data to be considered for this plant.	Refer necessary amendment in this regard.

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
		3.00.00	5 of 26	The Flue Gas Desulphurisation (FGD) System for Solapur-II 2X660 MW & Meja-I 2X660 MW shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point'..		Refer necessary amendment in this regard.
1585.	Section-VI Part-A Sub Sec-V / Salient Design Data & Sizing	1.00.00 / 2.00.00 / 3.00.00 / 4.00.00	1, 3, 5 & 7 of 26	The Flue Gas Desulphurisation (FGD) System ... shall be designed to comply with the requirements stipulated under 'Guarantee point and Design point' in the table..	NTPC is requested to furnish the flue gas data at FGD inlet for various loads (including minimum load point of steam Generator) and Coal.	Data will be furnished during detail engg stage.
				The FGD and the ancillary facilities shall be suitable for unlimited operation with all transients and <u>at any load point between the minimum and maximum load point of the Steam Generator.</u> Further, the FGD plant shall be suitable for an unlimited operation at any pollutant concentrations between minimum and maximum without exceeding the emission val-		
	Section-VI Part-B Sub Sec-I-M1 (FGD)	1.03.06	3 of 51			

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				ues of SO2 emission of less than 100 mg/Nm3 (6% O2 dry).		
1586.	Section-VI Part-A Sub Sec-V / Salient Design Data & Sizing	1.00.00 (5) / 2.00.00 (5) / 3.00.00 (5) / 4.00.00 (5)	1, 3, 5 & 7 of 26	Gas flow at the FGD inlet when firing respective coal in m ³ /s	NTPC to clarify the pressure (including site altitude correction) considered for the FGD inlet flue gas provided in m3/s for 800 MW & 660 MW units. Also, It is presumed that no other site specific correction need to be applied on the specified flue gas flow. NTPC to confirm.	No altitude correction is to be applied on the flue gas flow indicated in the referred clauses.
1587.	Section-VI Part-A Sub Sec-V / Salient Design Data & Sizing	6.00.00	10 of 26	Limestone Characteristics: Bond Index : 13 kWh/t	Bidder considered Limestone bond index as 13 kWh/t inline with Section-VI Part-A, Sub Sec-V / Salient Design Data & Sizing / Clause No. 6.00.00 / P.No: 10 of 26. Also, it is presumed that kWh/t corresponds to kWh/MT. NTPC to confirm.	Limestone Bond Index : 13 kWh/Sh.T (Min.) should be followed. Refer necessary amendment.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	6.05.01 (vi)	23 of 51	Limestone Bond Index : 13 kWh/Sh. T (Min.)		

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1588.	Section-VI Part-A Sub Sec-VI / Functional Guarantees & Liquidated Damages	4.02.00 (vi)	18 of 24	Waste Water: The Contractor guarantees that the maximum purge flow rate to waste water treatment system for the complete plant shall be 10m ³ /hr averaged over a 24 hour period from each unit.	It is presumed that waste water purge flow rate limit of 10 m ³ /hr (averaged over a 24 hour period) is applicable for each FGD unit of the plants having 660 MW & 800 MW units. For Nabinagar plant with 250 MW units, the purge flow rate limit for each FGD unit is considered as 5 m ³ /hr (averaged over a 24 hour period). NTPC to confirm.	Refer necessary amendment in this regard.
	Section-VI Part-A Sub Sec-VI / Functional Guarantees & Liquidated Damages	4.02.00 (xvii)	20 of 24	Waste Water Treatment System (Applicable for Barh-I 3X660 MW & Nabinagar 4x250 MW): The Contractor shall guarantee the followings. A) Wastewater treatment capacity(m ³ /hr) : ≥ 30 for Barh-I (3X660 MW) B) Wastewater treatment capacity(m ³ /hr) : ≥ 20 for Nabinagar (4x250 MW)		
1589.	Section-VI Part-B Sub Sec-I-M1 (FGD)	3.03.09	7 of 51	Provision shall be made for giving signal automatic bypass controls of the absorber in case of failure of the absorber spray system or the GGH.	Since GGH is not applicable for this project, the related tender requirements have been ignored. NTPC to confirm.	Bidders understanding is correct. GGH is not applicable for this package.

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
	Section-VI Part-B Sub Sec-I-M7 Zero Liquid Dis-charge System	3.01.00	3 of 32	The wastewater stream will be made up of reject water from FGD, GGH washing etc.		
	Section-VI Part-B Sub Sec-I-M7 Zero Liquid Dis-charge System	3.01.00 / B(3)	5 of 32	FGD Wastewater such as GGH washing water and filtrated water which is bled to control chloride concentration in FGD system shall be routed to Predelirifier(s).		
	Section-VI Part-B Sub Sec-I-M7 Zero Liquid Dis-charge System	3.01.00 / C(1)	7 of 32	FGD wastewater tanks(2x50%) shall designed to store FGD wastewater from all units of FGD system operated continuously for 24 hours and GGH washing water which is produced temporarily.		
	Section-VI Part-B Sub Sec-I-M9 MDL	MDL - S.No: 7,8,79,83,9 2,93,140,16 3, 167,244,24 6,247,259,3 40,392,429, 443,453,49		GGH Details		GGH Details will not be applicable.

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	FGD SYSTEMS					
		9,585,620.				
1590.	Section-VI Part-A Sub Sec-III-A1 FGD	1.03.00	1 of 9	The contractor shall also supply an auxiliary absorbent tank, common for the two units, for storage of absorber slurry of one unit.	One No. of Auxiliary Absorbent tank will be provided common for all the units of each plant and the tank will be suitable for storage of absorber slurry of one unit. Also, "employer" mentioned in the Section-VI Part-A Sub Sec-III-A1 FGD/ Clause No. 6.01.00/ P.No:5 of 9, is considered as typo and it shall be replaced with "contractor". NTPC to confirm.	Bidders understanding is correct. Refer necessary amendment in this regard.
	Section-VI Part-A Sub Sec-III-A1 FGD	6.01.00	5 of 9	The employer shall provide a common auxiliary absorbent tank, common for all the units, of sufficient capacity for storage of absorber slurry of one unit.		
	Section-VI Part-A Sub Sec-III-A1 FGD	2.04.00	2 of 9	The contractor shall terminate the flue gas duct (at a suitable point on the common flue gas duct to chimney upstream of the chimney terminal point and outside the chimney).	Inline with tender requirement, a new wet chimney is proposed for all the projects and the absorber outlet flue gas duct will be terminated upstream of this chimney. Hence, the flue gas	Refer necessary amendment in this regard.

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
	Section-VI Part-B Sub Sec-I-M1 (FGD)	3.02.04	6 of 51	The duct from Absorber outlet to bypass duct shall be made of Carbon steel of minimum 7mm thickness with 2 mm (minimum) thickness lining / cladding / wall paper of Alloy C276 / Alloy 59 or better material.	duct from outlet of the absorber to common flue gas duct (bypass duct) to chimney is not considered. NTPC to confirm.	
1592.	Section-VI Part-A Sub Sec-III-A1 FGD	2.06.00	2 of 9	Washed and dewatered gypsum from the dewatering system shall be fed to a belt conveyor (in Employer's scope). The contractor shall discharge the gypsum cake above the Gypsum handling belt conveyor being provided by the Employer.	Bidder presume that belt conveyor shall be in the "contractor" scope instead of "employer" scope. NTPC to confirm.	Bidders understanding is correct. Refer necessary amendment in this regard
1593.	Section-VI Part-A Sub Sec-III-A1 FGD	6.02.00	5 of 9	Auxiliary Absorbent Tank: The contractor shall provide 1x100% slurry pumps for pumping the slurry back to the absorber of any of the units in 8 hrs (max.).	Both the requirements are contradictory, hence 1x100% slurry pump per station is considered to pump back the slurry from the absorbent tank to the absorber.	Bidders understanding is correct. Refer necessary amendment in this regard
	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.08.02	29 of 51	Auxiliary Absorbent Tank: The contractor shall provide 2 x100% pump to pump back the slurry from the sump back to the absorber in a maximum		

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	FGD SYSTEMS					
				time of 8 hours.		
1594.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.23 7.08.01	20 of 51 29 of 51	It should be possible to discharge the absorber sump into the emergency drain tank within 2 hours.	Bidder presume that emergency drain tank mentioned in this clause refers to auxiliary absorbent tank. NTPC to confirm.	Bidders understanding is correct.
1595.	Section-VI Part-A Sub Sec-III-A1 FGD	7.00.00	5 of 9	Process Water & Cooling Water Storage & Pumping Scheme (For 2X800 MW)	It is presumed that "Process Water & Cooling Water Storage & Pumping Scheme" is applicable for all units. NTPC to confirm.	Bidders understanding is correct.
1596.	Section-VI Part-A Sub Sec-III-A1 FGD	7.08.00	6 of 9	Process Water Tanks: All the storage tanks shall be lined with vinyl ester based flake glass lining from inside.	NTPC to clarify the type of lining to be considered for process water tanks.	Interior surface of the tanks shall lined with replicable chlorobutyl/bromobutyl rubber lining of minimum 4 mm thickness or with vinyl ester based flake glass lining of minimum 3 mm thickness.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	13.03.07	34 of 51	Process Water Tanks: Interior surface of the tanks shall lined with replicable chlorobutyl/bromobutyl rubber lining of minimum 4 mm thickness or with vinyl ester based flake glass lining of minimum 3 mm thickness...		

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	FGD SYSTEMS					
1597.	Section-VI Part-A Sub Sec-V / Salient Design Data & Sizing	9.01.00/ a (6)	21 of 26	Noise Level for Air Compressor: Noise level shall not exceed 90 dBA to a reference level of 0.0002 microbar when measured at a distance of 1.5 meter above the floor. Required acoustic enclosures may be provided to meet the above condition. The discharge blow-off silencer and intake silencers shall be designed to meet the above noise limitation level. Noise Level: The equivalent weighted average of sound level measured at a distance of 1.5 m above floor level in each elevation and one meter horizontally from the base of any equipments furnished and installed under these specifications, expressed in decibel to a reference of 0.0002 microbar, shall not exceed 85 dB(A).	Noise levels for below auxiliaries are as follows: 1.Limestone ball mill: ≤ 90 dB(A) with barrier. 2.Crusher: ≤ 105 dB(A) NTPC to confirm	Bidder to refer necessary amendment in this regard.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	1.09.00	4 of 51			

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	FGD SYSTEMS					
	Section-VI Part-C General Technical Requirements	30.00.00	42 of 83	Noise Level: The equivalent 'A' weighted sound pressure level measured at a height of 1.5 m above floor level in elevation and at a distance of one (1) metre horizontally from the nearest surface of any equipment/machine, furnished and installed under these specifications, expressed in decibels to a reference of 0.0002 microbar, shall not exceed 85 dBA . However for Ball Mills the noise levels as per following shall also be acceptable: a) Ball Mill < 90 dBA		Bidder to refer necessary amendment in this regard.
1598.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.06.02	27 of 51	2x100% horizontal centrifugal pumps shall be provided for wash water requirements of belt filter.	Wash water for the belt filter should be clean water and not filtrate. The source of wash water should be the clarified	Bidder shall comply with the specification requirements.

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	FGD SYSTEMS					
	Section-VI Part-A Sub Sec-III-A1 FGD	5.04.00	5 of 9	The filtrate water from belt filter dewatering and wash water from washing system and the under flow from the secondary hydro-cyclone shall be taken to a common filtrate water tank. 2x100% pump shall be provided to supply wash water (for cake washing as well as belt cloth washing) to the belt filters.	water as stated in Section-VI, Sub-Section IV, Clause No- 1.06.00, Page No- 2 of 3. Therefore 2x100% pumps for wash water (filtrate) are not envisaged. NTPC to confirm .	
	Section-VI Part-A Sub Sec-IV Terminal Points & Exclusions	1.06.00	2 of 3	Gypsum Wash Water (Clarified Water): For Gypsum washing, Contractor shall take a tap off suitably from the existing HVAC header (HVAC make up pump discharge) available along C-row at CD bay rack for meeting the water requirement of Gypsum washing. The pressure available at TP will be 4Ksc (gauge) wrt FGL (approx.).		

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	FGD SYSTEMS					
1599.	Section-VI Part-A Sub Sec-IV Terminal Points & Exclusions	1.08.00	2 of 3	Waste Water: FGD waste water pipes shall terminate along with isolation valve at 5 Meters near HCSD Mixing Tank and 300 mm above FFL in HCSD Silo Area. Pressure at terminal point shall be 3.0 kg/cm2(g) , pH shall be 7.0 (approx.) and temperature shall be <50°C.	Normally temperature of waste water will be in the range of 50 to 60°C and no separate cooling system is considered for waste water. NTPC to confirm.	Noted.
1600.	Section-VI Part-A Sub Sec-III-A1 FGD	7.01.01	6 of 9	2x100% Process Water Pumps for each unit connected to each of the Process water Storage tanks (total 4 nos. of pumps for 2x800 MW) along with all necessary piping, valves, control & instrumentation. Each pump catering to process water requirement of one unit.	2 x 100% Process water pumps shall be provided for each unit. NTPC to confirm.	Specification requirement is clear in this regard.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	13.02.00	33 of 51	2x100% Process Water Pumps shall be provided for each unit connected to each of the Process water Storage tanks along with all necessary piping, valves, control & instrumentation. Each pump catering to process water		

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	FGD SYSTEMS					
1601.				requirement of one unit. The capacity of the pumps shall be such that it shall meet the maximum process water requirement of each unit..		
	Section-VI Part-A Sub Sec-III-A1 FGD	7.02.00	6 of 9	2x100% Mist Eliminator Wash Water Pump for each unit connected to each of the Process water Storage tanks (total 4 nos. of pumps for 2x800 MW) along with all necessary piping, valves, control & instrumentation. Each pump catering to mist washing requirement of one unit.	2 x 100% Mist Eliminator wash pumps shall be provided for each unit. NTPC to confirm.	Specification requirement is clear in this regard.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	13.03.00	34 of 51	2x100% Mist Eliminator Wash Water Pump for each unit connected to each of the Process water Storage tanks along with all necessary piping, valves, control & instrumentation shall be provided by the Contractor.		

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	FGD SYSTEMS					
1602.	Section-VI Part-B Sub Sec-I-M1 (FGD)	1.03.08	3 of 51	In case of a power failure all items of equipment (e.g. minimum one agitator in absorber and limestone slurry tank, flue gas damper upstream & downstream of FGD, Process water pump & lube oil system of Booster Fan & Ball Mill) which may cause irreversible damage to the FGD System shall be connected to the emergency power supply system to be provided by the Contractor.	Since, a new wet chimney is to be provided for the proposed FGD projects, flue gas damper downstream of FGD is not required and hence not envisaged. NTPC to confirm.	Bidders to Refer necessary amendment in this regard.
1603.	Section-VI Part-B Sub Sec-I-M1 (FGD)	3.01.00 (1)	5 of 51	The entire flue gas system, flue gas ducts, absorber etc. shall be designed to meet the following conditions: Design internal pressure at 67% yield strength (mmwc): +660 and -150 mmwc or maximum conceivable head of Booster fan (if provided), whichever is higher	Bidder considered duct design pressure inline with Section-VI Part-B, Sub Sec-I-M1 (FGD) / Clause No. 3.01.00 (1) / P.No:5 of 51. NTPC to confirm.	Refer necessary amendment in this regard.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	16.01.03	39 of 51	Duct Design Pressure: All flue gas ducts shall also be designed for ± 660 mm w.g., or		

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	FGD SYSTEMS					
				maximum conceivable pressure of the relevant fans, whichever is higher at 67% of yield strength of material		
1604.	Section-VI Part-B Sub Sec-I-M1 (FGD)	3.01.00 (5)	5 of 51	Maximum flue gas velocity through the Absorber (M/sec) : Not more than 4 m/s at Design Point Conditions	Bidder presume that the specified flue gas velocity limit refers to "Superficial gas velocity". NTPC to confirm.	Specification requirement is clear under the referred cl.no. 3.01.00 (5) . Bidder to comply with the specification requirements.
1605.	Section-VI Part-B Sub Sec-I-M1 (FGD)	4.01.01 (1)	8 of 51	Type of fans : Constant speed, Axial type.	Since, centrifugal type ID fans are provided for Nabinagar (4x250 MW) plant as per the information provided in Sub Sec-II-A11 (Project Information - Nabinagar 4x250 MW) / Table-5 / P.No:28 of 29 of tender specification, NTPC to clarify whether Booster fan can also be provided as Centrifugal type instead of axial type.	Bidder shall comply with the specification requirements.
1606.	Section-VI Part-B Sub Sec-I-M1 (FGD)	4.01.00	8 of 51	Additionally a pressure loss of 100 mm wcl (excluding margin) shall be built up in booster fan design criteria as mentioned below to take care of pressure loss due to future installation of	Since, additional pressure loss of 100 mmWc is to be considered on account of De-NOx system for booster fan sizing, NTPC to re-confirm the flue gas pressure at booster fan inlet.	Bidder shall comply with the specification requirements.

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	FGD SYSTEMS					
				De-Nox system.		
	Section-VI Part-B Sub Sec-I-M1 (FGD)	4.01.01 (3 - iii)	9 of 51	Pressure at Booster Fan suction : 0 mmWc		
	Section-VI Part-B Sub Sec-I-M1 (FGD)	4.02.00 (vi)	10 of 51	Pressure at Booster Fan suction : 0 mmWc		
1607.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.01.00 (iii)	14 of 51	All slurry recirculation pumps including motors shall be of the same size and type.	The slurry recirculation pump motor size and type will be same. Gearbox speed ratio for each pump will be different depending upon the head requirement of each spray level.	Noted.
1608.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.04.00	16 of 51	Gypsum Bleed Pump: The pumps shall be designed to meet the stipulations of Clause No.9.00.00 of this Sub-Section.	Clause No.9.00.00 of this Sub-Section indicated Vertical Sump Pumps. Bidder believe the reference shall be to Sub-Section 8.00.00 -Slurry Pumps. NTPC to confirm.	Bidders understanding is correct.
1609.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.10	19 of 51	The raw gas inlet duct of the absorber shall be equipped with a flushing device of the side walls and the ground, which shall operate continuously as	The proposed design of absorber is having a sloped inlet flue gas duct along with an inlet eyebrow design which negates the need for any duct wash as	Bidder shall comply with the specification requirements for flushing system.

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	FGD SYSTEMS					
				well as intermittently.	per the experience of QFGDM. So, duct wash & normal quench system is not required and hence not envisaged.	
	Section-VI Part-E	Scheme of FGD Absorber system	Drawing No: 0011-109-POM-A-001(a) - Rev.No:A	Normal Quench System with Quench Nozzles and Control valves		Normal Quench System with Quench Nozzles and Control valves shall be provided if it is the standard practise of the bidder/its collaborator.
1610.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.13	19 of 51	All internal members shall be lined with minimum 2 mm Alloy 59/ C276 .	NTPC to elaborate the definition of internal members i.e. whether these includes only structural members or all the components (Suction Strainers, baffles, Agitators, etc.) located inside the absorber. Also, NTPC to advise whether Polypropylene can be considered as the alternate MOC for Recycle pump suction screens.	All internal members of Absorber shall be lined with minimum 2 mm Alloy 59/ C276 unless material is specifically specified for any component.
		11.05.00	32 of 51	The material for the shaft (which is continuously in contact with slurry) and agitator blades of the Absorber Agitators shall be made with Alloy 926 or better material.		
	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.22	20 of 51	In case of Spray Tower System, Suction screens shall be installed inside the Absorber vessel to protect the Slurry recirculation pumps.		

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	FGD SYSTEMS					
1611.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.21	20 of 51	The bottom of the absorber sump shall be designed in such a way that complete drainage of the absorption liquid/slurry is possible and is accessible without damage of lining/rubber.	It is presumed that rubber lining is not acceptable for absorber sump (oxidation tank). NTPC to confirm.	Bidders understanding is correct. Refer necessary amendment in this regard.
1612.	Section-VI Part-B Sub Sec-I-M1 (FGD)	10.01.00	31 of 51	Slurry & Process Water Tanks: Coarse screen(s) at suction-side of these pumps shall be provided.	Coarse screens are generally considered at the suction side for slurry recirculation pumps only. All other slurry pumps are handling fine slurry only. Hence coarse screens are not envisaged for other slurry pumps and also process water pumps. NTPC to confirm.	Bidder shall comply with the specification requirements.
1613.	Section-VI Part-B Sub Sec-I-M1 (FGD)	6.03.05	22 of 51	In addition, a hand wheel with proper access shall also be provided for manual operation of the gate. The force at the rim of the hand wheel shall not exceed 35 kg with bunker full of coal.	It is presumed that "coal" mentioned in this statement is a typo and it shall be replaced with "limestone". NTPC to confirm.	Bidders understanding is correct. Refer necessary amendment in this regard.
1614.	Section-VI Part-B Sub Sec-I-M1 (FGD)	6.05.01 (ii)	22 of 51	Flow: 110% of limestone requirement of two absorbers at Design point	It is presumed that flow is to be considered as " 110% of limestone requirement of all units in operation at Design point" .	Bidders understanding is correct. Refer necessary amendment in this regard.

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	FGD SYSTEMS					
					NTPC to confirm.	
1615.	Section-VI Part-B Sub Sec-I-M1 (FGD)	6.06.01	24 of 51	For tank volume calculation, solid concentration (by weight) in the slurry shall be assumed, not more than 20% or actual required whichever is lower. The slurry pipes shall be lined with replaceable wear resistant natural rubber lining of minimum 10 mm thickness. Additional thickness of 2 mm in rubber lining shall be provided at bends.	NTPC to advise whether solid concentration (by weight) of 30% can be considered for tank volume calculation.	Bidder shall comply with the specification requirements at cl.no. 6.06.01.
1616.	Section-VI Part-B Sub Sec-I-M1 (FGD)	6.07.03	24 of 51		Rubber lining thickness of 3 to 6 mm is sufficient for slurry piping. NTPC to confirm.	Refer necessary amendment in this regard.
1617.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.04.01 (c)	26 of 51	Gypsum Purity : 90% (minimum)	Inline with Clause 4.02.00 (v), Sub-Section-VI, Section-VI, Part-A, it is presumed that the gypsum purity of 90% is to be maintained at guarantee point condition only.	Specification requirement is clear in this regard. Bidder to refer sub section-VI, Section VI part A for more details.

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	FGD SYSTEMS					
1618.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.04.03	26 of 51	The complete frame of the filter and all parts in contact with gypsum shall be made of corrosion resistant material or shall be provided with corrosion resistant liners of proven design.	Parts in contact with Gypsum (like Gypsum discharge chute) will be of Carbon steel with rubber lining. However, since the complete frame of filter is not exposed to Gypsum, the unexposed part of the filter frame will be made of Mild steel with Epoxy paint (MSEP) as per Industry practice . NTPC to confirm.	Noted.
1619.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.05.05	27 of 51	The vacuum receiver and pump internals shall be suitably lined to protect against the corrosive environment. The material selected for vacuum pumps & vacuum receivers shall be proven for similar application.	The liquid ring type vacuum pump doesn't require lining and hence the same is not considered. NTPC to confirm.	The material selected for vacuum pumps & vacuum receivers shall be proven for similar application and shall be subjected to approval of the Employer.
1620.	Section-VI Part-B Sub Sec-I-M1 (FGD)	10.01.00	31 of 51	All the slurry tanks (Slurry Tanks, Filtrate Tank, Secondary hydro cyclone feed tank, vacuum receiver tank, Waste water Tank, Lime Neutralization tanks etc.) shall be designed, fabricated, erected and tested in accordance with the IS:803, latest	IS 803 is considered for slurry tank design. This code also specifies hazard requirements related to storage of oil, which are not applicable for storage of limestone slurry. In view of this, hazard requirements for oil in IS 803 are not considered	Noted.

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	FGD SYSTEMS					
				edition.	for limestone slurry tank.	
1621.	Section-VI Part-B Sub Sec-I-M1 (FGD)	13.01.00	33 of 51	Process Water Storage Tanks: All the process water storage tanks shall be designed, fabricated, erected and tested in accordance with the IS:803, latest edition. Additional Corrosion allowance of 1.50 mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the bidder.	For all the Process water tanks, additional corrosion allowance of 1.50 mm is considered on the minimum tank shell thickness as calculated by IS:803. NTPC to confirm.	Bidder to refer necessary amendment in this regard.
	Section-VI Part-B Sub Sec-I-M1 (FGD)	13.03.07	34 of 51	All the Process water tanks (Process water Storage tanks, Clarified water tank, Emergency water storage tanks etc.) shall be designed, fabricated, erected and tested in accordance with the IS:803, latest edition. Additional Corrosion allowance of 3mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the Contractor.		

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	FGD SYSTEMS					
1622.	Section-VI Part-B Sub Sec-I-M1 (FGD)	14.17.00	36 of 51	Approach and Handling Facilities: Inter-connecting pipes/cables between various facilities of FGD plant shall be routed on the steel trestles to be provided by the contractor.	Since limestone slurry and Gypsum Bleed Slurry piping length is more in all the projects with site specific layout constraints, NTPC to advise whether existing pipe rack can be used instead of separate pipe rack.	Bidder shall comply with the specification requirement.
1623.	Section-VI Part-C General Technical Requirements		75 of 83	Public Address System	It is presumed that public address system is not in bidder's scope of supply. NTPC to confirm.	Public Address System is not in the scope of the bidder.
1624.	Section-VI Part-A Sub Sec-IV Terminal Points & Exclusions	1.13.01	3 of 3	Electrical Terminal points of Contractor's electrical scope, applicable for all systems/ subsystems described in relevant clauses for SCOPE is given below: (i) Terminals of Employers HT switchgear.	NTPC is requested to provide the location of Employers 11 kV switch board.	Employer's 11kV switchgear is located in main power house building.

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	FGD SYSTEMS					
1625.	Section-VI Part-B SUB-SECTION-IV-D CIVIL WORKS	6.08.00	24 of 69	Access to RCC roof of Gypsum dewatering building, FGD Control room building, MCC building, Ball mill building, Slurry Recirculation pump house, Oxidation blower are RCC framed building with Brick walls. In addition No wall / Cladding shall be provided for areas where Blower, Slurry Recirculation Pumps, Dewatering equipment, Limestone Ball mill were located since these areas need maintenance access for the above equipments. However Electrical Control room, MCC room will be enclosed type with Brick walls. NTPC to confirm.	Bidder understands that Gypsum Dewatering Building, FGD Control room, MCC building, Ball mill building, Slurry Recirculation pump house, Oxidation blower are RCC framed building with Brick walls. In addition No wall / Cladding shall be provided for areas where Blower, Slurry Recirculation Pumps, Dewatering equipment, Limestone Ball mill were located since these areas need maintenance access for the above equipments. However Electrical Control room, MCC room will be enclosed type with Brick walls. NTPC to confirm.	Bidder shall comply with technical specification requirement.
1626.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.07.07	28 of 51	All piping, valves & instrumentation upto the employer's terminal point shall be in the contractor's scope. Contractor shall provide the complete lime dosing system (in projects where	NTPC to furnish the size of Lime powder and inform whether the lime will be supplied in the form of bags or transported through truck.	Specification requirement is clear. Bidder shall comply with the specification requirements.

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	FGD SYSTEMS					
				separate Zero Liquid Discharge system for waste water treatment is not in the scope of the contractor) to correct the pH of the waste water by lime (83% purity) dosing shall be provided and after mixing of the effluent (using re-circulation system of the pumping system), the effluent shall be discharged once the waste water has been neutralized to desired pH.		
1627.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.07.02	27 of 51	The secondary hydrocyclone feed tank shall be sized to provide a minimum storage of 1 hr of primary hydrocyclone overflow with all the units operating at Design Point and no outflow from the tank.	The partial flow from primary hydrocyclone would be sent to filtrate tank and controlled flow as per purging requirement would be sent to secondary hydrocyclone. Hence secondary hydrocyclone feed tank will be sized for 1 hour storage of designed purge flow. NTPC to confirm.	Specification requirement is clear at cl. 7.07.02. Bidder shall comply with the specification requirements.

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	FGD SYSTEMS					
1628.	Section-VI, Part-A SUB-SECTION-V SALAIENT DESIGN DATA & SIZING	5.01.00	8 of 26	The chimney flue liner cladding shall be made of 2 mm thick Titanium (Grade 2 as per ASME SB265) or C-276 alloy over 8 mm thick (minimum) mild steel base metal of flue liner. Cladding shall be done to achieve the required quality as per ASTM B 898-11. External surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet over insulation.	Since new wet chimney will be handling only low flue gas temperature, Bidder proposes Fibre Glass Reinforced plastic as the alternate MOC (instead of MS with cladding) for flues of 250 MW units of Nabinagar plant. NTPC to confirm.	Specification requirement is clear at cl. 5.01.00. Bidder shall comply with the specification requirements.
1629.	Section-VI Part-B Sub Sec-I-M1 (FGD)	7.04.01	26 of 51	Chloride content < 100 ppm	In some of the plants, the chloride level of clarified water is high to achieve the desired chloride of 100 ppm in gypsum, NTPC to advise whether chloride levels of clarified water available in these plants can be lowered. NTPC to confirm.	Specification requirement is clear at cl. 7.04.01. Bidder shall comply with the specification requirements.

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Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1630.	Section-VI Part-A Sub Sec-III-A1-(FGD)	25.00.05	9 of 9	<u>Wet Stack Condensate Collection system</u> Storage tank/neutralization tank shall be complete with dosing, mixing and preparation system. After neutralization of the stack condensate collection, same shall be pumped to common drain system. Contractor shall provide 2 X100% pumps, complete with valves, piping fittings, level control/monitoring etc. Alternatively, bidder may propose its proven system for disposal of the condensate system in its bid for Employer's consideration. All the material in contact with the condensate shall be of suitable material for the operating duty	Since, condensate collected at the wet stack would be recycled back to absorber, neutralization of the stack condensate is not considered. NTPC to confirm.	Specification requirement is clear. Bidder shall comply with the specification requirements.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1631.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.01.00 a(v)	14 of 51	Minimum 10% spare nozzles shall be provided at each level.	Since a complete spray level for recirculation has been kept as standby, no separate margin on nozzle quantity is required for individual spray level. Hence, it is presumed that 10% spare nozzles would be required only if spare spray level is not provided. NTPC to confirm.	Specification requirement is clear at cl. 5.01.00 a(v). Bidder shall comply with the specification requirements.
1632.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.18 (iv)	20 of 51	A flushing device of the spray levels with water shall be installed. Flushing shall take place if spray levels are out of operation.	If the spray headers proposed are of self draining type and does not require separate flushing system. Hence no flushing considered for spray levels. NTPC to confirm.	Specification requirement is clear at cl. 5.06.18(iv). Bidder shall comply with the specification requirements.
1633.	Section-VI Part-B Sub Sec-I-M1 (FGD)	5.06.15	19 of 51	The other bridges(supports) shall be lined with minimum 2 Alloy 59/C276	NTPC to advise whether Flake glass lining can alternatively be considered for support trusses of Spray headers and Mist eliminators.	Specification requirement is clear at cl. 5.06.15. Bidder shall comply with the specification requirements.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
	BOP SYSTEM					
1634.	Section VI/Part A	4.04.02	15 of 19	FGD WASTE WATER TREATMENT SYSTEM FOR ZERO LIQUID DISCHARGE (ZLD) Bidder/Bidder's Sub vendor should have designed, supplied, erected/supervised erection and commissioned/supervised commissioning at least one (1) number of FGD Waste Water Treatment System (essentially comprising of Evaporator (Brine Concentrator) and/or Crystalliser, Vapour Compressor) operating in Coal fired unit(s) of power plant, having inlet feed as FGD waste water of TDS not less than 30,000	NTPC is requested to approve the vendors those have supplied ZLD system in industries other than FGD waste water treatment.	Specification requirement is clear. Bidder shall comply with the specification requirements.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS			ppm and treatment capacity of not less than 10 m3/hr. The above FGD Waste Water Treatment System should have been in successful operation for a period not less than one (1) year reckoned as on the date of consideration for approval but not later than six months after award date of contract to the Main bidder.		
1635.	Section VI / Part -B / I-M6	3.1.0	2 of 73	Limestone received through Indian railway rakes will be unloaded in one of these three side discharge wagon tipplers or track hopper.	Please clearly specify which track hopper / wagon tippler will received the Lime stone for each 11 nos of project	Either of Wagon Tippler or Track Hopper shall be used for unloading of limestone received using Indian Railways rakes as per availability.
1636.	Section VI / Part -B / I-M6	3.1.0	2 of 73	Limestone received through Indian railway rakes will be unloaded in one of these three side discharge wagon tipplers or track hopper.	Limestone will be received through existing coal handling system from track hopper / wagon tippler hence any wagon tippler, side arm charger along with its shed, track hopper along with its shed , plough at unloading area is not in bidder	Bidder's understanding is correct. For railway rake unloading facilities of existing coal handling plant shall be used.
	Sub Section III / Part A /A5	2.01.01	2 of 6			

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					Scope.	
1637.	Section VI / Part -B / I-M6	3.2.0	2 of 73	"As received" limestone shall be fed on the double stream conveyors from where the same shall be conveyed upto the crushers. The crushed limestone shall be conveyed by double stream conveyors up to the limestone storage shed. From the limestone storage shed paddle feeders will extract! reclaim crushed limestone and feed the same onto double stream conveying system up to the limestone mill bunkers.	NTPC to clarify whether Paddle feeder below reclaim hopper shall be of 1 x 100 % or 2 x 100% capacity.	Bidder shall comply with the technical specification stipulations.
				paddle feeders 1 x 100%		
	Section VI / Sub Section V / Part A	10.07.00	22 of 26	Conveyor bridges	NTPC to provide typical cross section of Conveyor Bridges if any	The same shall be provided to the successful bidder.
1638.	Section VI / Part -B / I-M6	4.1.7	5 of 73			

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1639.	Section VI / Part -B / I-M6	4.13.18	20 of 73	Dust extraction system for limestone handling system shall be dry type comprising of dust collection hoods, ducting, fans, bag filter and dust collection hopper. The limestone dust collected in dust collection hopper shall be periodically emptied back to the conveyor leaving the building	NTPC to clarify whether DE system for Lime stone handling shall be of Dry type or Wet Type.	DE system shall be dry type for Lime stone Handling and Gypsum Handling system. Bidder to refer Amendment in this regard.
1640.	Section VI /Sub Section V / Part A	10.15.00	25 of 26	Dust Extraction system shall be ventury type		
1641.	Section VI /Sub Section V / Part A	11.01.00	25 of 26	The Rated Capacity of the reclaimr conveyor 150 TPH	NTPC to clarify whether the rated capacity of reclaim conveyor shall be as per tender or it can be decided by the bidder based on the lime stone consumption for FGD.	Bidder shall comply with the technical specification stipulations
1642.	Section VI /Sub Section V / Part A	11.02.00	26 of 26	The covered storage shed / silo for limestone shall be sufficient to store limestone equivalent to consumption of minimum 7 days	It is presumed that 7 days storage is based on actual limestone consumption (averaged) and not reclaim conveyor capacity. NTPC to confirm.	Bidder to refer Amendment regarding Crushed Limestone storage capacity.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
	ELECTRICAL					
1643.	Section VI / part A / Sub section III B	1.02.00	1 of 6	HT and 415V Switchgear / Motor Control Centers (as shown in Electrical Single line diagram Drg. No. 0011-019- POE-J-001)	We understand that the Electrical distribution for each site as below. - 11KV Power supply of FGD package will received from Client 11KV Switchgear AHP / CHP breaker feeder. - Existing AHP / CHP feeder cables shall be replaced from existing 11KV Switchgear to FGD 11KV Switchgear. - AHP / CHP 11KV Switchgear incoming cable replacing work is in Bidder scope. - Our scope is start from outgoing terminal of existing 11KV Switchgear NTPC to confirm.	Refer amended Tender SLD & electrical sope.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1644.	Section VI / part A / Sub section III B	1.02.00	1 of 6	HT and 415V Switchgear / Motor Control Centers (as shown in Electrical Single line diagram Drg. No. 0011-019- POE-J-001)	NTPC to provide the following details - Load details for Existing AHP /CHP switchgear - Cable length between Exist- ing 11KV switchgear to FGD 11KV Switchgear - Cable length between FGD 11KV switchgear to Existing AHP / CHP 11KV switchgear	Refer amended tender SLD. -Cable length shall decided by bidder during detail engineering based on GLP.
1645.	Section VI / part A / Sub section III B	1.09.00	3 of 6	Complete Lighting system for internal and external areas for the plant, Building, Chim- ney and equipment in the bidder scope.	Lighting shall be provided for Bidder supplied FGD package only in our scope. For other area including street, road lighting and chimney lighting are in client scope. NTPC to confirm.	Bidder shall comply the requirement of technical specifications.
1646.	Section VI / part A / Sub section III B	1.13.00	5 of 6	Type Test	Type test reports for identical equipments shall be furnished. Separate type tests shall not be carried out for any electrical equipment.	Bidder shall comply the requirement of technical specifications.
1647.	Section VI / part B / Sub section II E1	1.01.00	1 of 7	Design ambient temperature : 50°C	We have considered the design ambient temperature for VFD (if applicable) and DG set shall	Bidder shall comply the requirement of technical specifications.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					be 40°C and all other shall be 50°C. NTPC to confirm.	
1648.	Section VI / part B / Sub section II E1	2.01.01	3 of 7	Adequate number of auxiliary transformers shall be provided to meet the demand on 11kV, 3.3kV and 415V systems under most onerous conditions, with the criteria that each 11kV / 3.3kV / 415 V switchgear / MCC / DB shall be fed by 2x100% or 3 X 50 %, 3x100% transformers / feeders, and these shall be rated to carry the maximum load expected to be imposed.	We have considered all transformers shall be 2x100% or 3x50% only. Any 3x100% configuration is not considered. NTPC to confirm.	Confirmed.
1649.	Section VI / part B / Sub section II E1	2.05.00	4 of 7	(a) All the 11 KV/ 3.3 KV & LT Incomers, Ties , Bus couplers, Transformer feeders shall be controlled from Switchgear SCADA and also from DDCMIS.	We understand that all the 11 KV/ 3.3 KV & LT Incomers, Ties , Bus couplers, Transformer feeders shall be controlled from purchaser SCADA system. New SCADA system is not required. NTPC to confirm.	Refer amendment to the technical specifications.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1650.	Section VI / part B / Sub section II E1	2.08.00	5 of 7	Complete DC system, comprising of batteries, battery charges, relays, contactors, timers etc shall be suitable for continuous operation at the maximum continuous float voltage including suitable temperature correction factors.	Common one no. of 110V DC system shall be considered for both units FGD package. Battery shall be Ni-Cd type NTPC to confirm	Bidder shall comply the requirement of technical specifications.
1651.	Section VI / part B / Sub section II E1	2.09.00	6 of 7	DG set(s) shall be capable of meeting 100 % of essential load requirements of FGD System including starting of the largest motor (DOL) with other loads connected without exceeding the permissible starting voltage drop.	We understand that the DG set shall be sized 100 % of essential load requirements of FGD System including starting of the largest low voltage essential (415V) motor (DOL). Any HT motors or non essential motors are not considered. NTPC to Confirm	Confirmed.
	PROJECT SPECIFIC INFORMATION					
	KUDGI-(3X800MW)-A1					
1652.	Section VI / Sub Section -II-A1	Project Information	-		NTPC is requested to provide Sieve analysis , moisture per-	Specification requirement is clear. Bidder shall comply with the specification

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CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					centage of limestone for proper selection and sizing of the Limestone crusher and Screen	requirements.
1653.	Section VI / Sub Section -II-A1	General Layout Plan	9573-999 - POC -F - 001-Rev-6D1	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided
1654.	Section VI / Sub Section -II-A1	General Layout Plan	9573-999 - POC -F - 001-Rev-6D1	Facilities for Stage -I Facilities for Stage-II	NTPC to Clarify for unloading of Lime stone from Rakes which facility shall be consider stage -I or Stage II Or for Both Facilities separate Limestone handling and FGD shall be consider Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2A/B 4. G.A. Drawing of transfer towers (TP-1 & TP-02) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-	Bidder to refer the revised GLP in issued amendments.
1655.	Section VI / Sub Section -II-A1	General Layout Plan	9573-999 - POC -F - 001-Rev-6D1			Only PDF provided. Bidder to refer the revised GLP in issued amendments.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					CAD format	
1656.	Section VI / Sub Section -II-A1	General Layout Plan	9573-999 - POC-F - 001-Rev-6D1		Facility for Stage :2 1. Please provide detail / GA drawing of Tunnel at WT 6,7&8 2.Detail / GA drawing of tunnel for Conveyor below Wagon Tippler 3.GA drawing of Conveyor below Wagon Tippler 4. G.A. Drawing of transfer tower (TP18 & TP19) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	LARA-(2X800MW)-A2					
1657.	Section VI / Sub Section -II-A2	Project Information	-		NTPC is requested to provide Sieve analysis , moisture per-	Specification requirement is clear. Bidder shall comply with the specification

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					centage of limestone for proper selection and sizing of the Limestone crusher and Screen	requirements.
1658.	Section VI / Sub Section -II-A2	General Layout Plan	9548-999 - POC -F - 001-Rev-6D0	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1659.	Section VI / Sub Section -II-A2	General Layout Plan	9548-999 - POC -F - 001-Rev-6D0		1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2A/B 4. G.A. Drawing of transfer towers (TP-1 & TP-02) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	GADARWARA-(2X800MW)-A3					
1660.	Section VI / Sub Section -II-A3	Project In-formation	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the	Specification requirement is clear. Bidder shall comply with the specification requirements.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					Limestone crusher and Screen	
1661.	Section VI / Sub Section -II-A3	General Layout Plan	9572 -999 -POC -F - 001-Rev- 5D1	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1662.	Section VI / Sub Section -II-A3	General Layout Plan	9572 -999 -POC -F - 001-Rev- 5D1		Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.1A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2 A/B 4. G.A. Drawing of transfer tower (TP-1 & TP-2) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	DARIPALLI-(2X800MW)-A4					
1663.	Section VI / Sub Section -II-A4	Project In-formation	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the	Specification requirement is clear. Bidder shall comply with the specification requirements.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					Limestone crusher and Screen	
1664.	Section VI / Sub Section -II-A4	General Layout Plan	9549 -999 - POC -F - 001-Rev-9	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1665.	Section VI / Sub Section -II-A4	General Layout Plan	9549 -999 - POC -F - 001-Rev-9		1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B & 3A/B 3.GA drawing of conv 1A/B ,Conv 2A/B & conv 3 A/B 4. G.A. Drawing of transfer towers (TP1 & TP 2) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format2	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
1666.	Section VI / Sub Section -II-A4	Project Information/ 7.00.01	10 of 30	The corresponding bore logs are enclosed at annexure- IV	Please provide bore logs data, since annexure IV is not enclosed	Specification requirement is clear. Bidder shall comply with the specification requirements.
	MOUDA-II-(2X660MW)-A5					

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1667.	Section VI / Sub Section -II-A5	Project In-formation	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the Limestone crusher and Screen	Specification requirement is clear. Bidder shall comply with the specification requirements.
1668.	Section VI / Sub Section -II-A5	General Layout Plan	9561 / 9575 -999 - POC -F - 001-Rev-11-D0	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1669.	Section VI / Sub Section -II-A5	General Layout Plan	9561 / 9575 -999 - POC -F - 001-Rev-11-D0	Facilities for Stage -I Facilities for Stage-II	Please Clarify for unloading of Lime stone from Rakes which facility shall be consider stage -I or Stage II Or for Both Facilities separate Limestone handling and FGD shall be consider	Bidder to refer the revised GLP in issued amendments.
1670.	Section VI / Sub Section -II-A5	General Layout Plan	9561 / 9575 -999 - POC -F - 001-Rev-11-D0		Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2 A/B 4. G.A. Drawing of transfer tower TP 1 & 2 before existing	Bidder to refer the revised GLP in issued amendments. Only PDF provided.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	
1671.	Section VI / Sub Section -II-A5	General Layout Plan	9561 / 9575 -999 - POC -F - 001-Rev-11-D0		Facility for Stage :2 1. Please provide detail / GA drawing of Tunnel at Conv.14 A/B 2.Detail / GA drawing of tunnel for Conveyor15A/B 3.GA drawing of conv 14A/B , conv 15 A/B 4. G.A. Drawing of transfer tower (TP13 &14) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	SOLAPUR-(2X660MW)-A6					
1672.	Section VI / Sub Section -II-A6	Project Information	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the	Specification requirement is clear. Bidder shall comply with the specification requirements.

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Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					Limestone crusher and Screen	
1673.	Section VI / Sub Section -II-A6	General Layout Plan	9571 -999 - POC -F - 001-Rev-5D0	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1674.	Section VI / Sub Section -II-A6	General Layout Plan	9571 -999 - POC -F - 001-Rev-5D0		1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2 A/B 4. G.A. Drawing of transfer tower (UGTP 1)before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
1675.	Section VI / Sub Section -II-A6	Project Information/ 7.00.01	10 of 30	The corresponding bore logs are enclosed at annexure- IV	Please provide bore logs data, since annexure IV is not enclosed	Specification requirement is clear. Bidder shall comply with the specification requirements.
	TANDA-II-(2X660 MW)-A7					

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1676.	Section VI / Sub Section -II-A7	Project Information	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the Limestone crusher and Screen	Specification requirement is clear. Bidder shall comply with the specification requirements.
1677.	Section VI / Sub Section -II-A7	General Layout Plan	9562-999 - POC -F - 001-Rev-8D1	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only pdf provided.
1678.	Section VI / Sub Section -II-A7	General Layout Plan	9562-999 - POC -F - 001-Rev-8D1		Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2 A/B 4. G.A. Drawing of transfer tower TP 1 & 2 before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	NABINAGAR-(3X660MW)-A8					

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1679.	Section VI / Sub Section -II-A8	Project In-formation	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the Limestone crusher and Screen	Specification requirement is clear. Bidder shall comply with the specification requirements.
1680.	Section VI / Sub Section -II-A8	General Layout Plan	0370 -999 - POC -A - 001-Rev-A	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1681.	Section VI / Sub Section -II-A8	General Layout Plan	0370 -999 - POC -A - 001-Rev-A		Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2 A/B 4. G.A. Drawing of transfer tower TP 1 & 2 before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	MEJA-(2X660MW)-A9					

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1682.	Section VI / Sub Section -II-A9	Project Information	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the Limestone crusher and Screen	Specification requirement is clear. Bidder shall comply with the specification requirements.
1683.	Section VI / Sub Section -II-A9	General Layout Plan	0360 / 0361 -999 - POC -F - 001-Rev-6-D0	PDF Drawing	NTPC is requested to provide the Autocad drawing	
1684.	Section VI / Sub Section -II-A9	General Layout Plan	0360 / 0361 -999 - POC -F - 001-Rev-6-D0	Facilities for Stage -I Facilities for Stage-II	Please Clarify for unloading of Lime stone from Rakes which facility shall be consider stage -I or Stage II Or for Both Facilities separate Limestone handling and FGD shall be consider	Specification requirement is clear. Bidder shall comply with the specification requirements.
1685.	Section VI / Sub Section -II-A9	General Layout Plan	0360 / 0361 -999 - POC -F - 001-Rev-6-D0		Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.1 A/B 2.Detail / GA drawing of tunnel for Conveyor 2A/B 3.GA drawing of conv 1A/B & conv 2 A/B 4. G.A. Drawing of transfer tower TP 13 before existing	Bidder to refer the revised GLP in issued amendments. Only PDF provided.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	
1686.	Section VI / Sub Section -II-A9	General Layout Plan	0360 / 0361 -999 - POC -F - 001-Rev-6- D0		Facility for Stage :2 1. Please provide detail / GA drawing of Tunnel at Conv.29 A/B 2.Detail / GA drawing of tunnel for Conveyor15A/B & 16A/B 3.GA drawing of conv 15A/B , conv 16 A/B & Conv.29A/B 4. G.A. Drawing of transfer tower (TP15 &16) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	BARH-II-A10 BARH STPP-I					
1687.	Section VI / Sub Section -II-A10	Project Information	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the	Specification requirement is clear. Bidder shall comply with the specification requirements.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					Limestone crusher and Screen	
1688.	Section VI / Sub Section -II-A10	General Layout Plan	9558 / 9560 -999 - POC -F - 001-Rev-8-D0	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided
1689.	Section VI / Sub Section -II-A10	General Layout Plan	9558 / 9560 -999 - POC -F - 001-Rev-8-D0	Legend : 5 Facilities for Stage -I Legend: 6 Facilities for Stage-II	Please Clarify for unloading of Lime stone from Rakes which facility shall be consider stage - I or Stage II Or for Both Facilities separate Limestone handling and FGD shall be consider Facility for Stage :1 1. Please provide detail / GA drawing of Tunnel at Conv.14 A/B 2.Detail / GA drawing of tunnel for Conveyor 1A/B 3.GA drawing of conv 1A/B & conv 14 A/B 4. G.A. Drawing of transfer tower before existing coal Crusher House	Specification requirement is clear . Bidder shall comply with the specification requirements.
1690.	Section VI / Sub Section -II-A10	General Layout Plan	9558 / 9560 -999 - POC -F - 001-Rev-8-D0			Bidder to refer the revised GLP in issued amendments. Only PDF provided.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					Please note all above drawing shall be provide in the AUTO-CAD format	
1691.	Section VI / Sub Section -II-A10	General Layout Plan	9558 / 9560 -999 - POC -F - 001-Rev-8-D0		Facility for Stage :2 1. Please provide detail / GA drawing of Tunnel at Conv.30 A/B 2.Detail / GA drawing of tunnel for Conveyor 31A/B & 15A/B 3.GA drawing of conv 31A/b & conv 15 A/B 4. G.A. Drawing of transfer tower (TP25) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments.
	BRBCL-(Nabinagar-4x250MW)-A11					

CLARIFICATION No.01 (TECHNICAL)**Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects**

Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1692.	Section VI / Sub Section -II-A11	Project Information	-		NTPC is requested to provide Sieve analysis , moisture percentage of limestone for proper selection and sizing of the Limestone crusher and Screen	Specification requirement is clear. Bidder shall comply with the specification requirements.
1693.	Section VI / Sub Section -II-A11	General Layout Plan	0270-999-POC-F-001-Rev-6	PDF Drawing	NTPC is requested to provide the Autocad drawing	Only PDF provided.
1694.	Section VI / Sub Section -II-A11	General Layout Plan	0270-999-POC-F-001-Rev-6		1. Please provide detail / GA drawing of Tunnel at Conv.9 A/B 2.Detail / GA drawing of tunnel for Conveyor 1A/B 3.GA drawing of conv 1A/B & conv 9 A/B 4. G.A. Drawing of transfer tower(TP1) before existing coal Crusher House Please note all above drawing shall be provide in the AUTO-CAD format	Bidder to refer the revised GLP in issued amendments. Only PDF provided.
	CIVIL					

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1695.	General (Project Information)	7.00.01	10 of 30	Geotechnical data and foundation system for the respective projects are enclosed at annexure- III	NTPC is requested to provide the detailed soil report near by chimney area for all projects.	Bidder to refer Foundation system and geotechnical data chapter furnished in Project information chapter.
1696.	COMMERCIAL					
1697.	Amendment no-1 to BDS (Sec-III)	ITB Clause no-26.4	1 of 1	LF Component (CIF price quoted in Schedule-1 plus CIF value of Import content of Ex-Works price included in Schedule-2) quoted by Bidder shall in no case be more than 30% of the total supply value quoted by bidder in price schedule-1 plus price schedule-2. Government of India has launched " Make in India" initiative to transform India into a global Design and manufacturing hub. Accordingly, to promote manufacturing within India, the import content in flue gas Desulphurisation (FGD) system package has been restricted	In view of limited suppliers for FGD equipment within India, it is presumed that these clauses are applicable for imported Bought Out items only, and imported raw materials does not fall under purview of 30% of the supply value. Therefore value of imported raw materials should be excluded and can be over and above this proposed limit of 30%. NTPC to clarify.	Bidder to refer clarifications being issued separately.
	Amendment no-1 to Technical Specification (Section-VI)	Sl.no-1	1 of 1			

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				to 30% of the total supply value quoted by bidder in Price schedule-1 plus Schedule-2. Bidder shall ensure that it does not import more than 30% of its supplies and shall manufacture/source equipments/components from within India to meet the aforesaid statement.		
1698.	Section - II (ITB)	Clause No 1.0 (E)	1 of 41	Price bids submitted by the Bidder shall be opened and evaluated separately for each Project in the sequence, the Projects are listed above at clause 1.0 (A). After opening of Price Bid for a particular Project, Reverse Auction among qualified Bidders shall be carried out for that Project to arrive at the lowest evaluated Bid. Price bid of a Bidder for the next project shall be opened after the	NTPC is requested to clarify if bidder can choose projects of their choice in case they are L1 in more than the number of projects they have opted for and submitted security deposit.	

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				completion of Reverse Auction of previous Project. However, in case eligible bidders (for Reverse Auction Process) for any Project(s) are three or less then price bid for that Project(s) may be opened after completion of Reverse Auction of other Projects.		
1699.	SECTION-IV GENERAL CONDITIONS OF CONTRACT (GCC)	10	17 of 63	Employer's Responsibilities	a. Whether proper space at site for hutments, covered office space with utilities, covered storage space for keeping the equipments/machinery and tools and tackles of the Contractor etc., will be provided by the Employer. Employer to clarify. b. Whether Employer will issue required forms, applications including Form- V to enable Contractor / Sub-Contractors to comply with la-	Bidder to refer clarifications being issued separately.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					bor laws.	
1700.	SECTION-IV GENERAL CONDI- TIONS OF CON- TRACT (GCC)	13.2.2	19 of 63	Advance Payment Security	As per this clause Bank Guarantee is to be reduced prorata every three months. However said provision is not appearing in the format provided for Advance Payment Security. Suitable modification in ABG format needs to be made. Employer to confirm.	Bidder to refer clarifications being issued separately.
1701.	SECTION-IV GENERAL CONDI- TIONS OF CON- TRACT (GCC)	25.2	39 of 63	Guarantee Test	a. There is no provision of deemed fulfillment of Functional Guarantees and as per the Contract the Contractor shall be obliged to conduct the same even after 12 months from date of Completion de-	Bidder to refer clarifications being issued separately.
	SECTION-V SPECIAL CONDI- TIONS OF CON-	13	6 of 15	Guarantee Tests and Operational Acceptance		

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
	TRACT (SCC)	14	6 of 15	GCC Clause	spite delay on the part of Employer. Could a cap on time period for Guarantee Test be put? Please confirm. b. Could need of additional Bank Guarantees (Cl. 14 of SCC) be omitted in view of the fact that the payment is delayed for the reasons not attributable to the Contractor.	Bidder to refer clarifications being issued separately.
1702.	SECTION-IV GENERAL CONDITIONS OF CONTRACT (GCC)	27.2 27.8	41 of 63 42 of 63	Defect Liability	a. As per clause 27.2 of GCC, the Defect Liability Period is to be commenced from Completion of Facilities or Operational Acceptance of the Facilities, whichever occurs first. It could be possible that there may be delay for the reasons not attributable to the Contractor in such event the warranty period may also be counted from the last major supply. Accordingly could it be possible to make a third limb for Defect Liability Period i.e. ___ months from the	Bidder to refer clarifications being issued separately.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
					last major supply? Employer to clarify	
1703.	SECTION - V SPECIAL CONDITIONS OF CONTRACT (SCC)	16 17	10 of 15	Completion Time Guarantee Functional Guarantees	Tender is silent on cumulative Liquidated Damages payable under the Contract for delay and shortfall in performance guarantees. Employer to please clarify.	Bidder to refer clarifications being issued separately.
1704.	SECTION-IV GENERAL CONDITIONS OF CONTRACT (GCC)	26 28	40 of 63 43 of 63	Completion Time Guarantee Functional Guarantees		Bidder to refer clarifications being issued separately.
1705.	SECTION-IV GENERAL CONDITIONS OF CONTRACT (GCC)	40	55 of 63	Extension of Time for Completion	This clause and other part of the Contract are silent on overhead costs except for bank charges & insurance on fixed rates, in case of delays attributable to the Employer. Employer to consider above request and provide an appropriate provision in this clause on this aspect.	Bidder to refer clarifications being issued separately.
	SECTION-V SPECIAL CONDITIONS OF CONTRACT (SCC)	19				Bidder to refer clarifications being issued separately.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1706.	SECTION-IV GENERAL CONDI- TIONS OF CON- TRACT (GCC)	3.6.1	5 of 63	Construction of the Contract	Tender specifies that Three Separate Contracts will be signed. Employer is requested to clarify whether Separate GST Nos. can be considered for Supply of Goods and Supply of Services. For Example: For First Contract, the Supply of Goods shall be executed from Noida GSTIN and For Second and Third Contracts, Supply of Ser- vices (erection, commissioning & Civil construction, etc.) shall executed from the GSTIN of the State where the Project is lo- cated.	Bidder to refer clarifications being is- sued separately.
1707.	SECTION VII PART - 3 OF 3 5. FORM OF CON- TRACT AGREEMENT	Appendix - 1		Schedule No. 4 : Installation Services (excluding Civil Works)	As per E/F(I)(B) II rate of inter- est on advance payment is mentioned as 12.60% per an- num however as per Bank Guarantee format thereof it is mentioned as 14% per annum. Please clarify which one is cor- rect.	Bidder to refer clarifications being is- sued separately.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1708.	SECTION II INSTRUCTION TO BIDDERS	10.6	20 of 41	Benefits/Exemptions to Supply for Mega Power Projects	NTPC to clarify whether only Basic Customs Duty is exempt on Imported Equipment under Mega Power Projects Policy or the exemption will be applicable on both Basic Customs duty and IGST.	Bidder to refer clarifications being issued separately.
	CONTROL & INSTRUMENTATION					
1709.	Section-VI Part-B SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.02.00	61 OF 73	All the above local control panels shall be accessible and located near their respective equipment and shall be complete with all the required controls, interlocks, annunciation's etc. However, for items (j.), above, controls shall be through contractor's PLC. Further, necessary controls, indications and annunciators for all the above equipment shall also be provided at main FGD Control Room as described under relevant clause.	Local control panel may consist of microprocessor based control system & connected to FGD PLC thru soft communication. NTPC to confirm	Bidder to follow specification requirements.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1710.	Section-VI Part-B SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	4.12.00	70 OF 73	<u>Lime Sampling system</u> (a) Lime Sampling Unit shall be controlled through PLC as per standard and proven practices of LSU equipment / LHP supplier, which will be located nearest MCC. Controls and interlocks for proper material flow shall be provided similar to conveyor system. Suitable Mimic shall be provided in the PLC. (b) Lime Sampling Unit shall be controlled through main FGD DDCMIS. Controls and interlocks for proper material flow shall be provided similar to conveyor system. Mimic shall be provided in the Operator Work Station (OWS) at main FGD control room.	Lime Sampling Unit shall be controlled through LSU supplier PLC & connected to FGD PLC thru soft communication. NTPC to confirm	It is clarified that the lime sampling unit shall be controlled through FGD PLC.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1711.	SECTION-VI, PART-A SUB-SECTION-III-C (C&I)	6.01.00	6 OF 8	CONTROL SYSTEM 6.01.00 Instrumentation and Control System with interlocks, protection and annunciation for FGD system and other system being provided under the contract shall be provided with Software and hardware as required to provide a complete functioning of the system. Dual processor based PLC system with PC based Operator Work Station (OWS), programmable station and A4 size color Laser printer etc. on as required basis (to be decided during detail Engineering) for controlling and monitoring of the FGD and associated system being provided under the contract located in FGD control room. One OWS shall also be provided with capabilities of programming station of PLC and Human Machine Interface system (EWS cum OWS). The PLC configuration	FGD system shall be controlled by PLC. DDCMIS is not considered for the FGD system NTPC to confirm	Bidder's understanding is correct.

TENDER NO. : PSER:SCT:NBH-C2080:20
CLARIFICATION No.01 (TECHNICAL)
Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				drawing shall be as per Tender drawing no. 0000-151-POI-A-013.		
	Section-VI Part-B SUB-SECTION-I-M6 LIMESTONE HANDLING PLANT (LHP)	3.3.0	59 OF 73	General Requirements The instruments and controls to be furnished and erected under this specification are as required for safe and satisfactory operation of the Lime Handling System, as outlined under mechanical section and as specified elsewhere in the specification. For the equipment and materials procured by the Contractor from his sub-vendors, the Contractor shall study the specification, safety requirements, interface drawings for such equipment and material in detail and		Bidder's understanding is correct.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				shall coordinate his work with his sub vendors and FGD DDCMIS system and supply instrumentation and control to suit the actual Lime stone and Gypsum Handling equipment.		
		3.04.02	60 OF 73	Design The complete lime handling plant shall be controlled from FGD DDCMIS system as detailed elsewhere.		Bidder's understanding is correct.
		4.01.00	60 OF 73	Coal Handling Plant Main Control Room Overall, operation of the following equipment of Lime Handling Plant shall be controlled from the main FGD control room through FGD DDCMIS being provided by the Contractor.		Bidder's understanding is correct.
1712.	Section-VI Part-A Sub Sec-III-C	2.02.00	2 OF 8	Single Input DIN rail mounting type temp transmitters (mounted in JB's) shall be provided by	Head mounted or dual input DIN rail mounted temperature transmitters shall also be provided	Bidder to follow specification requirement.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				the Contractor for all temperature elements under Contractor's scope.	vided as per contractor practice NTPC to confirm	
1713.	Section-VI Part-A Sub Sec-III-C2	3.01.00 3.02.00	8/9 OF 34	3 Housing/Head : IP-65/Diecast Aluminium. Head of TE to be provided with sufficient space and arrangement to mount head mounted temperature transmitter (as applicable). Plug in connectors are to be provided for external signal cable connection. TE terminal head shall be spring loaded for positive contacts with the thermo well.		Bidder to follow specification requirement.
1714.	Section VI / Sub Section-III, A1	4.01.11	Page 4 of 9	All Slurry re-circulating slurry pumps & Oxidation blowers shall be installed inside a building to be provided by the Contractor as per specifications specified elsewhere. All pumps & Oxidation blowers shall be in straight line. The building must be complete in all respect spe-	Since limited space allocated near Chimney area. For some of the Sites, Oxidation Blowers cannot be placed inline of Slurry Recirculation pumps. Anyhow, separate Enclosure Building with Hoists will be provided for Oxidation Blowers.	Bidder shall comply with the specification requirements. In case space is a constraint the same shall be reviewed and discussed after techno commercial bid submission.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
				cially facilitating the smooth operation and maintenance of associated equipment's of above systems by providing adequate maintenance space, handling facilities, walkways, staircase etc. The building shall be sufficiently ventilated.		
1715.	PART-B-I-MECH, SUB-SECTION-I-M1	16.01.05	Page 39 of 61 (Page 42)	c) Duct stiffening shall be by means of rolled sections. No internal stiffeners shall be used for ducts from Absorber outlet to chimney inlet.	If the Duct Stiffening Beam size increased more 600mm Depth. Plate Fabricated Stiffening Beams will be used.	Bidders query is not clear. Bidder shall comply with the specification requirements.
1716.	General Clarifications				The allocated space near Existing Chimney is not sufficient for accommodating. Limestone Milling Unit. Hence, Limestone Milling Building is proposed near 7 Days Storage Unit. Kindly Review & advise.	Bidder shall comply with the specification requirements. In case space is a constraint the same shall be reviewed and discussed after techno commercial bid submission.

CLARIFICATION No.01 (TECHNICAL)**Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects**

Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1717.	General Clarifications				The Terminal point for Lime-stone Inlet is before Coal Crusher House of CHP. By taking a Tap Off & running a Lime-stone conveyor from Tapped location to Allocated FGD Area, Instead of, We able to place Total Lime Handling System near Crushing Unit in the available spaces without disturbing the existing Buildings. NTPC Has to review & advise the proposed location. Significant Conveyor Lengths will be reduced in this scheme. All Applicable GA Drawings (Plan, Elevation & Sections) of existing Coal Handling Plant & CHP Cable Rack are required to prepare a Layout drawing of Limestone & Gypsum Conveying Package.	Bidder may come with proposal based on plant layout available in tender drawings and site visit. NTPC reserves the right to freeze a basic layout for each NTPC plant post techno commercial bid discussions.
1718.	General Clarifications					Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1719.	General Clarifications				Since the Piping, Cabling, Belt Conveyors of FGD Package has to run among & across the entire CHP, Coal Yard. Applicable GA Drawings are required.	Bidder to refer the revised GLP in issued amendments.
1720.						
1721.	TANDA Site Key Plan, 9562-999-POC-F-001, Rev-8D1			As per Site Key Plan Received, Space for FGD allocated is not sufficient for accommodating Chimney.	As per Site Key Plan Received, Space for FGD allocated is not sufficient for accommodating Chimney. Hence New Wet Chimney is proposed at the Coordinate at 1090W & 655N. NTPC has to review and confirm.	Bidder to refer the revised GLP in issued amendments.
1722.	TANDA Site Key Plan, 9562-999-POC-F-001, Rev-8D1			As per Site Key Plan Received, Space for FGD allocated for Gypsum Yard & Limestone Storage Yard is at a Green Belt Area near Coordinates 930W & 980N	Since, Terminal Point of Limestone Tap off point is located before Coal Crusher House, We have to run Limestone Conveyors in the non allocated area to accommodate the Limestone Handling System.	Bidder to refer the revised GLP in issued amendments.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1723.	Nabinagar, 4 x 250MW Site Key Plan, 0270-999-POC-F-001- (Rev-6)			As per Site Key Plan Received, Space for FGD is allocated between 1449N & 1500N for all 4 FGD Units.	Since, we have space available after 1584N, We able to propose a 2 FGD Units in the empty space without disturbing the any of existing Plant. Kindly review & approve the proposed location.	Bidder shall comply with the requirement of Technical Specification. However, the requirement for space will be deliberated with the Bidders during post techno commercial bid discussion.
1724.	Meja Site Key Plan, 0360-999-POC-F-001 - (Rev-6DO)			Space allocated for FGD Units are not sufficient to accommodate both FGD Units & Chimney.	Space allocated for FGD Units are not sufficient for accommodating both FGD Units. Hence, FGD Unit for Boiler -1 is proposed LHS side of ESP Unit-I between Cable Rack & ESP. NTPC has to review & advise the proposed location.	Bidder shall comply with the requirement of Technical Specification. However, the requirement for space will be deliberated with the Bidders during post techno commercial bid discussion.
1725.	Solapur Site Key Plan, 9571-999-POC-F-001 - (Rev-5DO)			Space allocated for FGD Units(50m x 70m) are not sufficient to accommodate both FGD Units & Chimney.	Since allocated Space of 50m x 70m is not sufficient for accommodating both FGD Units. New Wet Chimney is proposed in Coordinates 1200E, 450N approximately. Kindly review & advise the proposed location.	Bidder shall comply with the requirement of Technical Specification. However, the requirement for space will be deliberated with the Bidders during post techno commercial bid discussion.
1726.	Solapur Site Key Plan, 9571-999-POC-F-001 - (Rev-5DO)			Space allocated for FGD Units(50m x 70m) are not sufficient to accommodate both FGD Units & Chimney.	Since allocated Space of 50m x 70m is not sufficient for accommodating both FGD Units. New FGD Unit-II for Boiler-II is proposed at 1200E, 500N approximately.	Bidder shall comply with the requirement of Technical Specification. However, the requirement for space will be deliberated with the Bidders during post techno commercial bid discussion.

CLARIFICATION No.01 (TECHNICAL)

Flue Gas Desulphurization (FGD) System Package for Lot 1A Projects



Sl.No	Section / Part / Chapter	Clause No.	Page No.	As per RFQ	Pre Bid Queries	NTPC Clarifications
	FGD SYSTEMS					
1727.	Gadarwara Site Key Plan, 9572-999-POC-F-001 - (Rev-5D1)				Space Provided near Existing Chimney is not sufficient to accommodate New Wet Chimney. Hence, Wet Chimney is proposed at Coordinate 17147N, 17180E approximately. Kindly review the proposed location and advise.	Bidder shall comply with the requirement of Technical Specification. However, the requirement for space will be deliberated with the Bidders during post techno commercial bid discussion.
1728.	Mouda Site Key Plan, , 9561-999-POC-F-001 - (Rev-11-DO)			Space allocated for FGD Units(53m x 53m) are not sufficient to accommodate single FGD Unit & Chimney.	Space allocated near Existing Chimney for FGD Area is not sufficient for accommodating FGD Unit. Kindly advise an area planned for locating FGD Units. 1. What the Capacity of CHP/AHP transformer? 2. How many sets of spare SWGRs for owner? 3 Pls provide cable routing drawing of power plant separately.	Bidder shall comply with the requirement of Technical Specification. However, the requirement for space will be deliberated with the Bidders during post techno commercial bid discussion.
1729.	0011-109-POE-J-001		GENERAL			Point 1 & 2- Bidders to refer revised SLD issued with AMENDMENT TO TECHNICAL SPECIFICATION (SECTION VI). 3. To be finalized during detailed engineering.

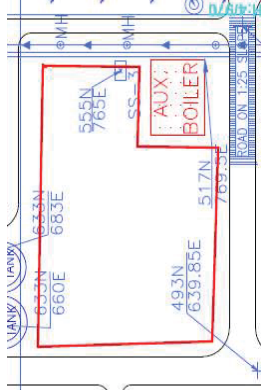
TENDER NO. : PSER:SCT:NBN-C2080:20
Lot1A Flue Gas Desulfurization Package
Clarification No.04 (Technical)

S.No.	Section/Part	Clause No.	Page No	Clause	Clarification	NTPC's Reply
1	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI Number- 35	13 of 60	"Sub QB for civil works:-" Clause Deleted	Since the clause mention here appear in a number of place in the tender specification. We understand that the clause is deleted from where ever it appears. Please clarify.	Bidder's understanding is incorrect. For Sub-QB for civil works, bidder to refer clause no. 4.02.00, Sub-section-I Intent of specification, Section-VI, Part-A of technical specification
2	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI Number- 100	38 of 60	The Maximum capacity of each Limestone storage Silo shall not exceed 2000 MT	Since the minimum capacity of limestone storage is 5000 MT, we request you to consider single silo size more than 2000MT. Please note that bigger silo are already in use in similar application in cement industries. Please note unnecessary limiting the silo capacity where space is a constrain will call for unnecessary cost implication and complications in layout. So request NTPC to delete this clause	Bidder to comply with technical specification stipulations
3	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	97	35 of 60	Unloading, Crushing and Bunker Feeding System	Kindly confirm the capacity of limestone unloading and conveying system upto crushed limestone storage area.	Capacity shall be 150 MTPH.
4	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	142 C	59 of 60	2x100% electric driven, single stage, integrally geared, single or dual vane(helical lobe) type with VFD drive,oxidation blowers.	We request NTPC to also consider Multistage centrifugal blower for this purpose. Please confirm.	This is not Clarification. Hence, bidder is requested to comply.
5	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	144	59 of 60	The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct shall be provided with 2 mm (minimum) thickness lining / cladding / Alloy C276 / Alloy 59 or better material.	Request NTPC to elaborate on the lining and cladding process. We understand that the cladding/lining with plug welding will also be acceptable. Please confirm.	It is clarified that only cladded plate of Alloy C276/ Alloy 59 or better material with Carbon steel base is allowed. Cladded plate can be manufactured by either rolling or explosion bonding process.
6	C&I Annexure I to X to AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	2.01.00	1 of 8	Field instrument based on field bus	Per clause 2.01.00 field bus requirement for electronic transmitters is not specified. However in clause 16.01.00 it is stated that field bus for electronic transmitters is required. Please clarify whether the requirement is with field bus instruments and control system OR only with field bus compatible instruments.	Bidder to refer clause no. 1.01.00 (f), Sub section III-C, PART-A, "Scope of supply and services" wherein it is mentioned that fieldbus(FF/Profibus) based instruments (PT/DP/TT). Fieldbus based Non-intrusive Electrical actuators are also envisaged which shall be connected to the DDCMIS. The protocol of fieldbus (FF/Profibus) for non-intrusive electric actuators and fieldbus based instruments shall be matching with fieldbus protocol of FGD System DDCMIS. PI also refer clause no. 1.02.01, Sub section III-C, PART-A, "Scope of supply and services" wherein it is mentioned that Fieldbus based actuators and fieldbus based instruments (PT/DP/TT) shall be provided for all applications. In case non fieldbus based actuators or transmitters are required for few applications then the same shall be discussed and finalized during detailed engineering.
7	C&I Annexure I to X to AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	1.02.01 (D)	3 of 19	The design of control system cabinets with field bus components shall be finalized during detailed engineering stage	At present stage if we consider the transmitters with hardware communication and not with field bus then, the only thing that would get connected to DCS controller through field bus are actuators as specified in clause 4.00.00 (C&I annexures Page 3 of 4). Hence kindly clarify whether clause no 16.00.00 (C&I annexure Page 5 of 8) which is for field instruments based on field bus is valid or not, keeping in view the clarification requested in point no 11 above. This will decide the requirement of field bus component in DCS.	PI also refer clause no. 1.02.01, Sub section III-C, PART-A, "Scope of supply and services" wherein it is mentioned that Fieldbus based control system for fieldbus based actuators and fieldbus based instruments (PT/DP/TT) shall be provided for all applications. In case non fieldbus based actuator or transmitters are required for few applications then the same shall be discussed and finalized during detailed engineering.
8	C&I Annexure I to X to AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	3.07.00	8 of 23	Note: For binary inputs, one changeover contact is counted as 2 inputs.	The note is not clear. Please clarify.	It is clarified that both contacts (i.e. 'NC' + 'NO' together) of changeover switch shall be wired to DDCMIS. Accordingly for binary inputs, one changeover contact is counted as 2 inputs.
9	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 119	Page 47 of 60	A "wet Chimney" shall be without FGD system in operation. The chimney flue liner cladding shall be made of 2 mm thick Titanium (Grade 2 as per ASME SB265) or C-276 alloy over 8 mm thick (minimum) mild steel base metal of flue liner. Cladding shall be done to achieve the required quality as per ASTM B 898-11. The top flue liner above the roof slab shall be made of solid C276 / Titanium (Grade 2 as per ASME SB265) of minimum 10 mm thickness.	NTPC to provide the height of 10mm thick C276 / Titanium liner or elevation of roof slab.	The minimum length of flue liner projecting over the chimney roof shall be atleast equal to diameter of flue liner

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10	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 119	Page 47 of 60	 External surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet over insulation. The wet stack shall be designed as per the guidelines of EPRI Revised Wet Stack Design Guide. Alternatively, ... year full replacement guarantee and fulltime onsite QA supervision, during erection & commissioning, by the supplier of the lining system. External surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet.	Bidder understands that by providing 10 mm thick Titanium / C-276 liner (above roof slab), the following clauses are not applicable. "External surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet over insulation." & "External surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet." NTPC is requested to delete the same.	This clause will also be applicable
11	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 52	Page 20 of 60	The wind shield shall be designed for vertical loading, cross wind loading, seismic loading, circumferential wind loading, thermal gradients etc. The analysis and design of wind shield shall be carried out as per IS 4998. The wind shield shall be analysed for cases with and without flue liner loads.	The bidder understands that wind shield shall be analysed and designed for cases with and without flue liner loads as per IS 4998 : 2015 (Design of Reinforced concrete chimneys - Criteria, 3rd revision) using limit state method. This is in line with CS-0011-109(LA)-2-AMDT-05(T). Sr.no 36; page 13 of 60. NTPC is requested to confirm.	Bidders understanding is correct.The analysis and Design of wind shield shall be as per the latest chimney IS 4998:2015.
12	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 145	Page 60 of 60	Thermal Insulation along with aluminium cladding shall be provided for all the equipment's/surfaces having skin temperature more than 60 degree Celsius except for absorber. Further, Thermal insulation of min 70 mm shall be provided for absorber outlet flue gas duct irrespective of skin temperature.	Bidder understands that thermal insulation of min 70 mm shall be provided for absorber outlet flue gas duct irrespective of skin temperature, while transition duct inside the chimney and chimney flue liner shall be painted with corrosion resistant paint in case of exterior surface temperature < 60 degrees. NTPC is requested confirm.	Thermal insulation of min 70 mm shall be provided for absorber outlet flue gas duct irrespective of skin temperature. Transition duct inside the chimney and chimney flue liner shall be painted with corrosion resistant paint for Boro Silicate Lining and insulated for Titanium/C276 cladding irrespective of surface temperature.
	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 60	Page 23 of 60	All exposed steel surfaces (including exterior surface of mild steel flue liner in case the design does not envisage provision of thermal insulation on the exterior surface of flue liner) shall be painted as specified in corrosion protection clause of this specification.		
13	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 34(b)	Page 12 of 60	The type of aviation obstruction lighting system shall be of high intensity aviation obstruction lights having an effective intensity of 4000 to 200,000 cd (minimum) depending upon back ground The obstacle lights shall flash simultaneously at a rate between 20 to 60 per minute. A minimum of three levels will be provided with aviation obstruction lights and there will be four light units per level. The lowest level should not be lower than 45 meters above the ground and vertical spacing of the intermediate levels could vary between 45 and 105 meters. The intermediate lights shall be spaced as equally as possible. Aviation obstruction lighting shall be complete with lights, photo cell, controller, special cables, etc.	The bidder would like to consider providing high intensity aviation obstruction lights at only two levels for 150 m high chimney and three levels for 220 m high chimney stack. The same is in line with ICAO regulations. NTPC is requested confirm.	Specification requirement is clear in this regards. Bidder to follow the technical specification requirement. Aviation warning lights to be provided at three levels.
14	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	SI.no. 46	Page 16 of 60	Single-flue chimney(s) shall be provided, except for Tanda TPP (2X660MW) and Meja TPP (2X660MW) where twin-flue Chimney shall be provided. Chimney shall be of reinforced concrete construction. There shall be one flue (liner) for each unit. The flue gas emission point for single flue chimney shall be minimum 150 meters above the plant grade level and for twin flue chimney flue gas emission point shall be minimum 220m above the plant grade level.	For optimal layout, bidder requests NTPC to provide option for Single-flue Chimney(s) also for NTPC Tanda (2x660MW) and NTPC Meja (2x660MW), meeting all specification requirements for single flue chimney. NTPC is requested confirm.	Option for single or twin flue is allowed for Tanda & Meja

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15	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	Sl.no. 63	Page 25 of 60	General Layout Plan..... 7. Tanda (2x660 MW) 9562-999-POC-F-002 Rev.10 (Civil Annex 12)	Space marked in the layout near to the stock pile is not adequate for firmment of all the FGD systems. Bidder requests NTPC to provide additional space in space for laydown & pre-assembly activities (future green belt area) Grids between 800W - 1200 W and 800N - 1200N	Bidder to accommodate the FGD facilities within space shown in tender drawing.
16	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	Sl.no. 63	Page 25 of 60	General Layout Plan..... 6. Solapur (2x660 MW) 9571-999-POC-F-001 Rev.6 (Civil Annex 11)	Space provided in the amended layout is not sufficient to accommodate both units Absorbers along with the FGD MCC room. Bidder request NTPC to reconsider the earlier provided space near the Auxiliary boiler for the FGD system. I.e at Grids between 600E - 800 E and 400N - 600N NTPC is requested confirm. 	Bidder to accommodate the FGD facilities within space shown in tender drawing.
17	SUB-SECTION I-M6 - Sec VI, Part B	Sl.no. 2.1.0	Page 58 of 73	Drive arrangement - Electric motor, scoop type hydraulic coupling, gear box.	As recommended by the hammer mill OEM's, it is generally recommended to go with V-belt drive instead of scoop coupling with gear box. We have following advantages: a) V belt acts as shock absorber, when crusher rotor is jam due to any tramp iron piece comes in between rotor, v belt will slip and damage to the motor is avoided. b) There is service factor - 1.2, in such case there shall be loosening of one or two belts balance v-belts will take and power and crusher will run, in case of scoop coupling the crusher has to stopped. OEM' s have supplied in most of the Cement Plant using v belt transmission for Limestone crushers of near about capacities(150 - 200 tph). Bidder request NTPC to accept the same.	V belt drive is also acceptable for Hammer mill.
18	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	Sl.no. 121	Page 48 of 60	Waste Water The Contractor guarantees that the maximum purge flow rate to waste water treatment system shall be 10m3/hr (except for BRBCL where it shall be less than 5 m3/hr) averaged over a 24 hour period from each unit.	Bidder envisages that the maximum purge flow rate to waste water treatment system for projects with 800 MW units shall be 15m3/hr averaged over a 24 hour period from each unit.	This is not clarification. Hence, bidder is requested to comply.
19	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	Sl.no. 119	Page 47 of 60	Cladding shall be done to achieve the required quality as per ASTM B 898-11. The top flue liner above the roof slab shall be made of solid C276 / Titanium (Grade 2 as per ASME SB265) of minimum 10 mm thickness.....	Please note that ASME SB265 is applicable for Titanium clad plate. For C276 cladding SA265 is applicable. Please confirm.	Bidder's understanding is correct.
20	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	Sl.no. 62	Page 24 of 60	All steel parts embedded in concrete like bolts, nuts, washers, pipe sleeves and insert plate shall be galvanized as per IS:4736. The minimum weight for galvanizing shall be 610 g/sq.m and shall comply with relevant IS Codes.	Bidder envisages that for fasteners IS 1367, Part 13 will be followed. Please confirm.	Specification requirement is clear in this regard. Bidder to follow technical specification.
21	AMENDMENT NO. CS-0011-109(LA)-2-AMDT-05(T)	Sl.no. 140	Page 56 of 60	Barh-I (3X660MW) clauses and drgs revised considering that FGD outlet will be connected to ID fan discharge duct with additional damper(s).....	As for Barh-I (3X660MW) the Flue gas is passing through existing chimney, bidder requests NTPC to kindly furnish the pressure required to be maintained at Chimney inlet at FGD design point.	For FGD design point, consider pressure drop of 40 mm through chimney or actual whichever is higher.

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22	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1T)	136 (Mech Annexure-IV)	Page 3 of 3	5.00.00 AUXILIARY POWER CONSUMPTION (PA): xxv. Power consumption of Gypsum conveying system (Single Stream) except Lighting, Hoists, Sump Pumps, DE, Ventilation, SW System, Potable water system. The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct up to absorber outlet flange shall be provided with 2 mm (minimum) thickness lining / cladding / Alloy C276 / Alloy 59 or better material.	Since limestone handling system & gypsum handling systems are common systems, bidder envisages to apply duty factor for gypsum handling system as 0.15 to the unitised power consumption. Accordingly, Pu for the same shall be duty factor x power consumption. Please confirm.	Bidder to comply with technical specification stipulations
23	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1T)	Sl.no. 144	Page 59 of 60	The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct up to absorber outlet flange shall be provided with 2 mm (minimum) thickness lining / cladding / Alloy C276 / Alloy 59 or better material.	Based on the referred amendment, bidder understands that the following options are available for the bidders for selection: 1) Lining as an alternate to cladded sheet for entire absorber with 2 mm (minimum) thickness 2) Material of lining/cladding shall be Alloy C276 / Alloy 59 / better material as per proven practice of the bidder	It is clarified that only cladded plate of Alloy C276/ Alloy 59 or better material with Carbon steel base is allowed. Cladded plate can be manufactured by either rolling or explosion bonding process.
24	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1T)	Sl.no. 142	Page 59 of 60	2x100% electric driven, single stage, integrally geared, single or dual vane centrifugal type / positive displacement (Helical lobe) type with VFD drive, oxidation blowers complete with integral gearbox, lube oil system, instrumentation and accessories. The blower will be used for supplying a variable volume of air to the absorber reaction tank.	Bidder offers Jet Bubbling Technology, wherein oxidation air flow is significantly higher at lower pressure and is also contrary to what is being provided for spray tower / conventional FGD systems. Owing to the lower pressure & high flow requirement, we request you to also introduce option of centrifugal fan with VFD for JBR. Hence request you to modify the specification as below: 2x100% electric driven, single stage, integrally geared, single or dual vane centrifugal type oxidation blower / centrifugal fan with VFD drive / positive displacement (Helical lobe) type oxidation blower with VFD drive, oxidation blowers complete with integral gearbox, lube oil system, instrumentation and accessories. The blower / fan will be used for supplying a variable volume of air to the absorber reaction tank.	VFD for positive displacement (helical lobe) type oxidation blower is mandatory, however, for centrifugal type blower it is optional.
25	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1T)	2	1 of 60	Existing: Clause no. 1.01.01, ... , 2.07.00	Bidder understands that indicated Cl.No.2.07.00 instead refers to Cl.No.1.07.00 of existing specification Section VI-A Sub-section-VII Cl.No.1.25.00. Kindly confirm / clarify.	Bidder's understanding is correct.
26	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1T)	95	34 of 60	Limestone handling through road only		
27	CS-0011-109(1A)-2-AMDT-05(1T), C&I Annexure-VIII, VI-A, Sub-section-IIIC (C&I)	10.01.00	16 of 19	Hardwired Signal exchange: Hardwired signal exchange between BOP DDCMIS / CHP DDCMIS (under Employer's scope) and FGD DDCMIS (under Contractor's scope).. (for Barh-1 (3 X 660 MW)) CEMS system shall be provided by the contractor in existing chimney as specified for other projects for new chimney in common specification.	Bidder understands that considering Limestone handling through road only, no interface is envisaged between FGD system and CHP system. Accordingly, hardwired interface of Bidder's FGD DDCMIS and Employer's CHP DDCMIS shall not be applicable. Kindly confirm / clarify.	Bidder's understanding is correct in view of limestone handling through road only.
28	CS-0011-109(1A)-2-AMDT-05(1T), Mech Annex-VI, Sub-section-IIIA-1, FGD	1.06.00	1 of 1		(a) Bidder understands that for Barh-1 project CEMS, only Oxygen analyser shall be included in Bidder's scope. Kindly confirm / clarify. (b) Bidder understands that accordingly only Notes-3 & 8 of C&I Annexure-VIII Cl.No.3.03.01 shall be applicable for Barh-1. Kindly confirm / clarify.	(a) Bidder's understanding is not correct. It is clarified that Oxygen measurement in stack, Mercury in stack emission and flue gas flow at stack are in the contractor's scope of supply for BARH-I project. (b) It is clarified that Notes 3, 4, 6, 7, 8, and 9 of clause 3.03.01, PART-A, Subsection IIIC are applicable for BARH-I projects.
29	CS-0011-109(1A)-2-AMDT-05(1T), C&I Annexure-VIII, VI-A, Sub-section-IIIC (C&I)	3.03.01,	12 of 19	Notes-9: Analyzers mentioned in S.No. 1 to 5 of the above list of flue gas analyzers for CEMS are not applicable for BARH-I project. However, Oxygen (O2) measurement in stack emission based on Paramagnetic/ Zirconia type instrument shall be provided by the Contractor for BARH-I project for correction of SO2, NOx and Particulate matter value corresponding to the standard/reference O2.		

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30	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-I, VI-B, Sub-section-III-C2, Measuring Instruments	10.01.00	1 of 13	ANALYSER INSTRUMENTS (OTHER THAN CEMS) Note: Analysers shall be placed inside CONTAINERISED ROOM (PORTABLE CABIN) provided by the contractor.		
31	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-I, VI-B, Sub-section-III-C2, Measuring Instruments	11.00.00 (viii)	5 of 13	CEMS analysers shall be placed inside CONTAINERISED ROOM (PORTABLE CABIN) provided by the contractor.	Bidder understands - (a) Analysers with air conditioning is envisaged only for Extractive (Hot-extractive/Dilution type) type Flue gas analysers. Kindly confirm / clarify. (b) Extractive (Hot-extractive/Dilution type) analysers requiring air conditioning shall be provided with Panel AC or kept in AC room / Portable Cabin, to meet analyser requirement. Kindly confirm / clarify.	Bidder's understanding is not correct. Pl refer clause no.3.02.00, Sub section III-C, PART-A, "Scope of supply and services" wherein it is mentioned that all weather analyser panel located in air conditioned containerised room (Portable cabin) shall be provided for housing analysers except in situ analysers.
32	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-I, VI-B, Sub-section-III-C2, Measuring Instruments	11.07.00, Notes (03)	13 of 13	If the SO _x , NO _x , CO ₂ & CO (if sampling/dilution type) analysers do not meet the environmental conditions specified at cl. 7.00.00 of Sub Sec IIIC-01, Section-VI, Part- B, all weather Local Panel fitted with integral Air Conditioner located in non-air conditioned area shall be provided for housing analysers etc.		
33	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-VIII, V-A, Sub-section-IIIC (C&I)	3.02.00	10 of 19	All weather analyser panel located in air conditioned containerised room (Portable cabin) shall be provided for housing analysers except in situ analysers.		
34	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-II, Part-A, Sub-section-VII, Mandatory Spares, 1.25.00	1.03.00A (i)	3 of 6	Analysers and associated items for other than CEMS: (i) Analysers for SO ₂ , O ₂ , pH - 1 no. complete analyser of each type and model.	Bidder understands that as per Tender Specification, O ₂ analysers are envisaged only for CEMS. Accordingly mandatory spares for O ₂ analyser for other than CEMS, shall not be applicable. Kindly confirm / clarify.	It is clarified that mandatory spare for O ₂ analyser (other than that envisaged under CEMS) shall be applicable in case the O ₂ analyser is supplied for any FGD application other than CEMS. The same shall be discussed and decided during detailed engineering.
35	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-II, Part-A, Sub-section-VII, Mandatory Spares, 1.25.00	2.07.00, 1(E)	4 of 6	Other HMIPIS devices required for Unified HMIPIS which are not covered in above items like protocol converters, stations with software, gateway etc - 10% of each type and model	Bidder understands that Unified HMIPIS and mandatory spares for the same, is not applicable for the FGD DDCMIS. Kindly confirm / clarify.	Bidder's understanding is correct.
36	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-VII, Part-A, Sub-section-VII, Mandatory Spares, 1.25.00	2.07.00, 4	5 of 6	Electronic modules of each type and model for Master and Slave Clock etc....	Bidder understands that mandatory spares for Master and Slave Clock is not included in Bidder's scope. Kindly confirm / clarify.	Bidder's understanding is correct.
37	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-VI, VI-B, Sub-section-IIIC-05, DDCMIS	1.06.06	3 of 23	DDCMIS shall meet all requirements stipulated under other Sub-sections/sections of the specification including Sub-Section-IIIC, Part-A, (including the requirement Authorization to shipment test ATST) Quality assurance (Part B, Section VI of technical specifications) & General Technical Requirements (Part C Section VI of Technical Specifications).	Bidder is unable to find DDCMIS ATST/Quality assurance requirements & availability calculation procedure in referred sections. Employer to kindly clarify.	Bidder to refer clause 2.12.00, PART-A Sub section IIIC for ATST requirement. Further ATST procedure shall be approved by employer during detailed engineering. Bidder to refer Part-B, Sub section V for Quality assurance requirement. The availability calculation/test procedure shall be approved by employer during detailed engineering.
38	CS-0011-109(1A)-2-AMDT-05(T), C&I Anneuxure-VI, VI-B, Sub-section-IIIC-05, DDCMIS	12.06.00	22 of 23	The availability of system shall be calculated as per Sub-section-IV, Part-A, Section-VI of specifications.		

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39	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VI, VI-B, Sub-section-IIIC-05, DDCMIS	3.01.02	5 of 23	FIELD BUS (Foundation Fieldbus/ Profibus) Interface Redundant host/ master card and redundant power supply along with diagnostic module shall be provided	Bidder understands that redundancy of host / master and power supply is envisaged only for segments with critical measurements / controls. Kindly confirm / clarify.	Bidder's understanding is not correct. It is clarified that Redundant host/ master card and redundant power supply along with diagnostic module shall be provided for all segments.
40	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VI, VI-B, Sub-section-IIIC-05, DDCMIS	3.06.00	8 of 23	Remote input/output modules may be located in harsh environment, the modules shall be designed in such a way to work continuously under the harsh environment expected to be encountered in these areas (high temp, dust level, humidity etc.).	Bidder understands that as per Annexure-VII, VI-A, Sub-section-IIIC (C&I), Remote I/O cabinets shall be placed in air conditioning environment. Accordingly I/O modules of Remote I/O cabinets are not envisaged for continuous operation in harsh environment. Kindly confirm / clarify.	Bidder to refer clause 4.01.00, PART-B Sub section II-C1, wherein It is mentioned that Instruments, devices and equipments for location in outdoors/indoor/air-conditioned areas shall be designed to suit the environmental conditions indicated in the table and shall be suitable for continuous operation in the operating environment of a coal fired utility station and also during periods of air conditioning failure without any loss of function, or departure from the specification requirements covered under this specification. Bidder to comply with the specification requirement mentioned in the above clause for Remote input/output modules.
41	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VII, VI-A, Sub-section-IIIC (C&I)	2.02.04	4 of 19	Contractor shall place RIO cabinets inside building with air conditioning environment.		
41	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VII, VI-A, Sub-section-IIIC (C&I)	1.02.01	2 of 19	Fieldbus based control system for fieldbus based actuators and fieldbus based instruments (PT/DPT/TT) shall be provided for all applications. In case non fieldbus based actuator or transmitters are required for few applications then the same shall be discussed and finalized during detailed engineering.	Employer to kindly clarify the applications for which non-fieldbus type MOVs or transmitters (PT/DP/TT) are envisaged.	The applications for which non-fieldbus type MOVs or transmitters (PT/DP/TT) are envisaged shall be finalised during detailed engineering after discussion with FGD OEM.
42	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VII, VI-A, Sub-section-IIIC (C&I) CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-II, Part-A, Sub-section-VII, Mandatory Spares	2.02.00 1.22	3 of 19 6 of 6	 The Control System of FGD DDCMIS has following process blocks as minimum. Any other systems apart from the below mentioned systems shall be included in the common system. FIRE DETECTION AND PROTECTION 7.5) PLC CONTROL SYSTEM 7.6) 24V – DC POWER SUPPLY SYSTEM	Bidder understands that common systems like Fire protection system shall be controlled from the FGD DDCMIS Common system process block, and no dedicated PLC is envisaged for the same. Accordingly, Employer to kindly clarify the requirement of mandatory spares for PLC Control system & 24VDC supply system for Fire Protection system.	Noted. However, the same shall be discussed and decided during detailed engineering.
43	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VII, VI-A, Sub-section-IIIC (C&I)	2.02.01	4 of 19	(b) Common system process blocks: i. Gypsum De watering Handling common system block. ii. Lime stone preparation and handling common system block. iii. Other associated common system.	Bidder understands that a Common process block is envisaged including all common systems like Gypsum dewatering & handling, Limestone Slurry preparation and other common systems. Kindly confirm / clarify.	It is clarified that three Common system process blocks are envisaged as mentioned below: i. Gypsum De watering Handling common system block ii. Lime stone preparation and handling common system block. iii. Other associated common system.
44	CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VII, VI-A, Sub-section-IIIC (C&I) CS-001.1-109(1A)-2-AMDT-05(T), C&I Annexure-VII, VI-A, Sub-section-IIIC (C&I)	2.10 (b) 2.10 (e)	7 of 19 7 of 19	Marshalling cabinets separate from system cabinets for terminating inputs from field, MCC/SWGR etc. for further wiring to control system and for terminating outputs from control system to MCC/SWGR etc. In case DDCMIS supplier can provide system cabinet with suitable partition to create separate marshalling area on the rear side of the system cabinet, ensuring that dust ingress does not take place in system area, the same can also be accepted subject to Employer's approval during detailed engineering stage	Bidder understands marshalling may be provided on the rear side of system cabinet or as separate cabinets, as per Control System OEM's recommendation. Kindly confirm / clarify.	The same shall be discussed and decided during detailed engineering.

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45	CS-0011-109(1A)-2-AMDT-05(T), C&I Annexure-VII, V-A, Sub-section-IIC (C&I)	2.15.00	9 of 19	Output redundancy is applicable for 10% of drives distributed in various functional groups. Exact application shall be finalized during detailed engineering.	Bidder understands output redundancy shall be applicable for 10% process drives only, not including MOVs, Pneumatic On/Off / Control valves, Electrical breakers etc. Kindly confirm / clarify.	It is clarified that Output redundancy is applicable for 10% of drives including MOVs, Pneumatic On/Off / Control valves, Electrical breakers etc., distributed in various functional groups.
46	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl.no. 46	Page 16 of 60	For Barh-I (3X660MW) already existing 275m high chimneys shall be utilized with modifications as specified elsewhere in mechanical specification and hence, new chimney is not to be provided under FGD package. General Arrangement Drawing of already existing Chimneys at Barh-I are provided in Sub Section-II -A10, Part A, Section-VI for reference.	Bidder understands that existing chimney in BARH-I is equipped with Earthing and Lightning Protection, Aviation Lightings and all other lightings and its accessories (Platform & staircase). Hence bidder shall not consider the same in its scope of supply. NTPC is requested to confirm.	Bidder understanding is correct.
47	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl.no. 21	Page 8 of 60	Termination..... (Tender drg. No 0000-211-POE-A-51-RA of cable lug attached at the end of this chapter.) Tender drawing attached as Electrical Annexure E3- 0000-211-POE-A-51-RA.	Bidder understands that conductor size HT Power cables (to be 95sqmm, 150 Sqmm and 300 sq mm) mentioned in the drawing is just for reference. Also, Tender has not indicated any standard cable sizes for HT cables. Bidder can use any size of HT Cable apart from the sizes mentioned in this drawing.	Bidder's understanding is clear. However, Bidder to meet sizing criteria clause no 2.16.00 of Sub Sec E7, HT Cable of tech spec.
48	CS-0011-109(1A)-2-AMDT-05(T), C&I Annexure-VII, part-B, Sub-section-IIC-10 POWER SUPPLY	1.04.00	3 OF 7	Battery Health Monitoring System (BHMS)	As per the confirmation received to clarification Sr. no. 829 in DOC no. CS-0011-109(1A)-2-CLRF-TECH-01, page:374 of 736, Bidder understand that Battery health monitoring system shall not be applicable to FGD package. Please confirm the understanding wrt clarification reply.	Bidder's understanding is not correct. It is clarified that as per clause 1.00.00 and 1.05.00, part-B, Sub-section-IIC-10, POWER SUPPLY, BHMS for 24V DC power supply and UPS is in the scope of contractor. The referred clarification (Sr. no. 829 in DOC no. CS-0011-109(1A)-2-CLRF-TECH-01, page:374 of 736) pertains to BHMS of main plant 220V DC system mentioned under Electrical section of technical specification.
49	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	144	59 of 60	The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct up to absorber outlet flange shall be provided with 2 mm (minimum) thickness lining / cladding / Alloy C276 / Alloy 59 or better material.	Since, as per the amendment, option of either lining or cladding of Alloy C276 / Alloy 59 is provided, NTPC is requested to clarify whether application method (e.g. wall papering) other than cladding can also be considered. Also, the requirement "2 mm (minimum) thickness lining / cladding / Alloy C276 / Alloy 59 or better material" is read as "2 mm (minimum) thickness lining / cladding of Alloy C276 / Alloy 59 or better material". NTPC to confirm.	It is clarified that only cladded plate of Alloy C276 / Alloy 59 or better material with Carbon steel base is allowed. Cladded plate can be manufactured by either rolling or explosion bonding process.
50	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	46	17 of 60	For Barh-I (3X660MW) already existing 275m high chimneys shall be utilized with modifications as specified elsewhere in mechanical specification and hence, new chimney is not to be provided under FGD package. General Arrangement Drawing of already existing Chimneys at Barh-I are provided in Sub Section-II -A10, Part A, Section-VI for reference.	Since, existing chimney is to be used for Barh-I project, Bidder understands that the flue gas velocity limit of <18 m/s (at Design point) for chimney is not applicable for this project. NTPC to confirm. Further, NTPC is requested to inform the draft loss and flue gas velocity in the existing duct (downstream of absorber outlet tap-off point) and chimney.	Bidder understanding on velocity in chimney is correct. For draft loss, consider pressure drop of 40 mm through chimney or actual whichever is higher. Velocity inside the duct and chimney can be calculated based on the FGD flow at the absorber outlet.
	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	119	47 of 60	<18 at Design Point		

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51	CS-0011-109(1A)-2-AMDT-05(T)	46	17 of 60	Single-flue chimney(s) shall be provided, <u>except for Tanda TPP (2X660MW) and Meila TPP (2X660MW) where twin-flue Chimney shall be provided.</u> Chimney shall be of reinforced concrete construction. There shall be one flue (liner) for each unit. The flue gas emission point for single flue chimney shall be minimum 150 meters above the plant grade level and for twin flue chimney flue gas emission point shall be minimum 220m above the plant grade level.	Bidder understands that single flue chimney is also acceptable where twin flue chimney is mentioned. NTPC to Confirm.	Bidders understanding is correct.
52	CS-0011-109(1A)-2-AMDT-05(T)	123	49 of 60	In order to optimise power consumption of FGD system at part load operation, Bidder to provide atleast one slurry recirculation pump preferably lower level with Variable Frequency Drive (VFD).	Bidder understands that gearbox is not required to be provided for the recirculation pump with variable frequency drive. NTPC to confirm.	Bidder may decide for gearbox in case recirculation pump is with variable frequency drive.
53	CS-0011-109(1A)-2-AMDT-05(T)	123	49 of 60	In order to optimise power consumption of FGD system at part load operation, Bidder to provide atleast one slurry recirculation pump preferably lower level with Variable Frequency Drive (VFD).	<u>NTPC to advise for the following:</u> For Nabhinagar-4x 250MW unit the Motor rating for SRC (Slurry Recirculation Pumps) pumps will be approx.550 KW and as per latest amendment bottom level of pump motor will be with VFD of 690 V as per VFD specification, and all other remaining level motors will be with 3 Phase 6.6 KV AC motor as per original tender specification, which makes different voltage levels for different levels of SRC pumps motor (i.e Bottom level SRC pump motor with 690V LT and other level motors with 6.6 KV HT). Since the voltage levels for SRC pump motors are different, this will violate the NTPC specification of (As per Clause no-5.01.00 (ii) of Sub Section-I-M1 of Section-VI) <u>All slurry recirculation pumps including motors shall be of the same size and type.</u>	All slurry recirculation pumps including motors shall be of the same size and type except for VFD driven SRC pump-motor set.
54	CS-0011-109(1A)-2-AMDT-05(T)	Electrical Annexure-E2	Clause no- 3.03.00	The voltage level for the VFD output to be fed to motor shall be as follows:- 1. Upto 400 kW : 415V/690V, Low Voltage, Three Phase AC 2. <u>Above 400kW and upto 700 KW : 690V, Low Voltage, Three Phase AC</u> 3. Above 700KW : Medium Voltage	NTPC to clarify whether VFD is required only for Positive Displacement type blowers or both Positive Displacement Blowers and Centrifugal type blowers.	VFD for positive displacement (helical lobe) type oxidation blower is mandatory, however, for centrifugal type it is optional.
55	CS-0011-109(1A)-2-AMDT-05(T)	142 [c]	54 of 60	2x100% electric driven, single stage, integrally geared, single or dual vane centrifugal type / <u>positive displacement (helical lobe) type with VFD drive.</u> oxidation blowers complete with integral gearbox, lube oil system, instrumentation and accessories. The blower will be used for supplying a variable volume of air to the absorber reaction tank.	NTPC to clarify whether VFD is required only for Positive Displacement type blowers or both Positive Displacement Blowers and Centrifugal type blowers.	VFD for positive displacement (helical lobe) type oxidation blower is mandatory, however, for centrifugal type it is optional.

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S.No.	Section/Part	Clause No.	Page No	Clause	Clarification	NTPC's Reply
56	CS-001.1-109(1A)-2-AMDT-05(T)	63	25 of 60	General Layout Plan - Kudgi (3x800 MW) 9573-999-POC-F-001 Rev.8 (Civil Annex 6) - Lara (2x800 MW) 9548-999-POM-F-001 Rev.9 (Civil Annex 7) - Gadawara (2x800 MW) 9572-999-POC-F-001 Rev.7 (Civil Annex 8) - Daripali (2x800 MW) 9549-999-POC-F-001 Rev.11 (Civil Annex 9) - Mouda (2x660 MW) 9561/9575-999-POC-F-001 Rev.12 (Civil Annex 10) - Solapur (2x660 MW) 9571-999-POC-F-001 Rev.8 (Civil Annex 11) - Tandia (2x660 MW) 9562-999-POC-F-002 Rev. 10 (Civil Annex 12) - Nabinagar JV (3x660 MW) 0370-999-PO-F-001 Rev.11 (Civil Annex 13) - Meja (2x660 MW) 0360/0361-999-POC-F-001 Rev.8 (Civil Annex 14) - Barh (3x660 MW) 9559/9560-999-POC-F-001 Rev.9 (Civil Annex 15) - Nabinagar (4x250MW) 0270-999-POC-F-001 Rev. 9 (Civil Annex 16)	NTPC is requested to provide the Autocad format for the GLP (General Layout plan).	All GLP in pdf format already provided.
57	CS-001.1-109(1A)-2-AMDT-05(T)	101	39 of 60	Suitable number of motorized travelling tripper / flow diverter plough (as applicable) on each feeding conveyor for feeding the crushed limestone to the covered storage shed/Silo. Trippers shall be complete with all mechanical, electrical equipment, rails, chute work, rail supporting structure (along with structural stools, as required), cables with cable festooning arrangement, thruster brakes, rail clamps, electric hoist, actuator flap gates etc.	Considering the 150 TPH capacity and layout, Bidder recommends Reversible Belt feeder / Diverter type Y-Chute to feed the Limestone in to limestone bunkers which is more suitable than Fixed tripper / Plough arrangement for one day storage silo.	Bidder to comply with technical specification stipulations
58	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T), Sl. No-106, page-40 of 60			The absorber oxidation tank, absorber tower & absorber outlet duct up to absorber outlet flange shall be provided with 2 mm (minimum) thickness lining / cladding / Alloy C276 / Alloy 59 or better material.	Based on Amendment No. 3 dtd. 02-11-2017, we have submitted Techno-commercial offer considering Clad Steel for complete Absorber vessel. However, based on recent Amendment, we understand that Bidder is allowed to choose either lining or Cladding of 2mm thick C-276 / Alloy 59 for submission of Price Bid. Request NTPC to confirm the same.	It is clarified that only clad plate of Alloy C276/ Alloy 59 or better material with Carbon steel base is allowed. Cladded plate can be manufactured by either rolling or explosion bonding process.
59	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T), Sl. No-46, page-16 of 60			Single flue chimney(s) shall be provided, except for Tunda TPP (2X660MW) and Meja TPP (2X660MW) where twin flue Chimney shall be provided. Chimney shall be of reinforced concrete construction. There shall be one flue (lined) for each unit. The flue gas emission point for single flue chimney shall be minimum 150 meters above the plant grade level and for twin flue chimney flue gas emission point shall be minimum 220m above the plant grade level. The centre to centre distance between the proposed chimney(s) and the existing chimney(s) in any direction shall not be less than 150 metres. For Barh-I (3X660MW) already existing 275m high chimneys shall be utilized with modifications as specified elsewhere in mechanical specification and hence, new chimney is not to be provided under FGD package. General Arrangement Drawing of already existing Chimneys at Barh-I are provided in Sub Section-II -A10, Part A, Section-VI for reference.	Bidder understands that 5 m³/hr capacity of condensate storage tank in common to be provided irrespective of no of units. Request NTPC to confirm the same. For Barh-I PJ, Bidder understands only stack lining & condensate collection system will be provided by bidder. Bidder is considering common condensate storage tank with capacity of 5 m³/hr catering to all the Three Units stack. Also, desing conditions of flue gas exiting the stack need to be provided as Condensate study is included in bidders scope. Request NTPC to confirm & provide the same.	Bidder's understanding is correct. Additional details shall be provided during detail engineering.

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S.No.	Section/Part	Clause No.	Page No	Clause	Clarification	NTPC's Reply
60	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T), Si. No.-142, page-57 of 60			Following note is added. Note:- 3 For the purpose of sizing of equipments and guarantee, MgCO3 shall be considered as unreactive dolomitic form.	NTPC to clarify the procedure for measuring the limestone consumption for such cases i.e without considering the reactivity of MgCO3 at the time of Performance Guarantee Test.	Limestone consumption guarantee shall be based on available (Reactive) CaCO3 content of 89%, reactive CaCO3 content of 79% for sizing. This is already specified in Clause no. 6.00.00 Note, Sub Section V of Section VI, Part A . Impact of non reactive MgCO3 is already considered in the % of CaCO3 (89%). In view of this, there is no need to consider again impact of unreactive MgCO3 dolomitic form for guarantee and sizing of equipment.
61	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Si. No.142	57 of 60		Noted this point in amendment. However Bid doesn't have any mention about Limestone reactivity, which is considered as one of the major Characteristic parameter for the system design & performance guarantees. It can be understood that even the limestone samples with highest purity level will have different reaction times. Some sample may not be fit for the FGD application itself, hence the reactivity parameter has to be specified in bid document for the mutual benefit. The same was discussed during the technical meeting held on 4 & 5th April 2018 & We are requesting Client to clarify on this point and issue the suitable amendment.	
62				Following note is added. Note:- 3.For the purpose of sizing of equipments and guarantee, MgCO3 shall be considered as unreactive dolomitic form	Proposed Text for Amendment on "Limestone reactivity" Reactivity has to be measured according to VGB M701 or EPRI standard. We kindly ask NTPC Ltd to consider this in the amendment, as we have requested on this topic through emails & discussion in NTPC office. Based on the specified test procedure we request the following conversion rates/relationships for the used limestone: 1. Conversion rate of limestone after 5 min> 39 % 2. Conversion rate of limestone after 10 min > 47 % 3. Conversion rate of limestone after 30 min> 65 % This specification will guarantee that the limestone is suitable for the FGD application. <u>Atleast the below point shall be agreed by Client:-</u> "The limestone quality provided by Client will be suitable for Limestone Wet FGD Operation "	Limestone consumption guarantee shall be based on available (Reactive) CaCO3 content of 89%. This is already specified in Clause no. 6.00.00 Note, Sub Section V of Section VI, Part A
63					The email dated 3th April to NTPC: On April 4th we have sent you our first results from our R&D project where we are testing different limestone samples from India. The diagram shows first results from limestone mines in Gujarat and Rajasthan. The colored lines shows the reactivity (conversion rate) curve of the tested limestone samples, the full line in black shows the lower and upper limit of our reference limestone. (We have tested numerous samples of the reference limestone and found results in the band between this 2 curves) Any reactivity curve from a tested limestone which is fully above the lower black line represents a suitable limestone and of course also any reactivity curve which is above the upper black line is suitable as it shows an even better reactivity. So based on this analyses the LAB 3078-1 limestone sample is by sure not suitable, we got it from a mine in the Gujarat state. There are 2 more samples LAB 3078-14, LAB 3078-16 which show a lower as requested reactivity in the first 500 sec; these results are under further investigation The VGB method as well as the EPRI method define the analysis procedure of the limestone reactivity measurement. In none of these methods a reference curve – showing the min necessary reactivity – is specified. The reference curves are always based on the know How and the experience of the FGD supplier, meaning that each FGD supplier should have his own requirement to the reactivity of the limestone. Usually the employer defines the requested limestone reactivity towards the limestone supplier and shows this specification also in the tender documents. Based on this and based on the result of our limestone reactivity tests we have proposed the wording for the amendment. I am convinced that any FGD supplier will be happy to see this definition and would be able to accept this definition	

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64	SUB-SECTION H-M1- Part B	5.06.13	19 of 51	All internal members shall be lined with minimum 2 mm Alloy 59/ C276 . All metallic fasteners which are provided inside the absorber/absorber wet-dry interface ducting shall be of Alloy 59/ C276.	With reference to the material of construction of the FGD Plus layer, we would like to highlight the following additional points for your kind consideration. Please also consider our E mail sent on April 5th and 7th 2018 We fully understand your concern for the temperature issue. But we have successfully installed the FGD plus layer in our plants, which are in operation without any issues. We are intending to use PP material, as C276 is not suitable for the FGD plus layer. It is a choice purely by technicality and our patent is also for this material. As you are aware that the Polypropylene (PP) is basically a plugging resistant material, which is quite resistant to chemical reaction and binding with the scale that forms due to slurry in the FGD system. Thus, the formation of scale is slowed and the scale does not bind with the surface. Therefore, the scale can be easily removed. Since this module is located at the bottom of the spray level, this module gets automatically flushed with the recirculation slurry. The slurry tends to coat onto the Alloy/C 276 material due to surface interactions between the slurry and Alloy/C 276 surface microstructure. It scale up faster and worse – the scale reacts with the material forming a strong bond between scale and material. This affinity towards scale formation is a hindrance to the performance of FGD plus module and become almost impractical without PP material. Any change in material of construction to C276 cannot meet the desired performance. Please note that there are several other components in FGD Absorber too, which are also not lined with Alloy C276 due to functional requirement. • Mist eliminator (PS) • Spray headers (FRP) • Spray nozzles (SC) • Oxidation lance inside slurry sump (FRP) • Strainers inside slurry sump (PP) Still, these component would provide the desired performance and life. In the similar lines, the material of construction of FGD plus component too, have been selected to give the desired performance without compromising on the desired corrosion resistance. However, the supporting structure of FGD plus layer will be made of carbon steel with Alloy lining as per Tender requirements. We kindly request NTPC to accept our design. We confirm the FGD plus system will give excellent performance and will provide excellent resistance against erosion and corrosion. We request Client to confirm on this point.	This is not clarification. Hence, bidder is requested to comply.
65	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	SI.No.-114	44 of 60	The complete frame of the filter and all parts in contact with gypsum shall be made with corrosion resistant material.	During NTPC technical meeting, we have requested Client to include corrosion resistant coating such as plastic coats over the Mildsteel frames of filter. So kindly confirm on the same.	This is not clarification. Hence, bidder is requested to comply.
66	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	SI.No.-46	17 of 60	For Barh-I (3X660MW) already existing 27.5m high chimneys shall be utilized with modifications as specified elsewhere in mechanical specification and hence, new chimney is not to be provided under FGD package. General Arrangement Drawing of already existing Chimneys at Barh-I are provided in Sub Section-II -A10, Part A, Section-VI for reference.	Client to mention the fluegas pressure (mmWC) available at terminal point (Downstream of booster fan) at Existing ID fan duct to Existing stack. This is required for sizing the booster fan for Barh Project.	Bidder understanding on velocity in chimney is correct. For draft loss, consider pressure drop of 40 mm through chimney or actual whichever is higher. Velocity inside the duct and chimney can be calculated based on the FGD flow at the absorber outlet.
67	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Point no-46	16 of 60	Single-flue chimney(s) shall be provided, except for Tanda TPP (2X660MW) and Meja TPP (2X660MW) where twin-flue Chimney shall be provided. Chimney shall be of reinforced concrete construction.	Noted for Tanda (2x660 MW); For MEJA (2x660 MW) : Within the available spaces allocated as per GLP provided in amendment, the TWIN stack arrangement cannot be accommodated. Whereas the area provided near Coal stock pile (very far from existing chimney) will increase the duct length substantially, also has to cross the railway tracks and this is not a recommended design. Hence kindly allow us to proceed with single wet stack option. Kindly confirm.	For Meja & Tanda, both the option of Single & twin flue is allowed.
68	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Point no-95	34 of 60	Limestone will be received to power plant through road by truck.	1) Considering this amendment, we are providing 150TPH conveying system along with rated capacity of 150TPH for Crusher, screen & bucket elevator. Kindly confirm.	Bidder's understanding is correct.

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69	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Point no 102	39 of 60	Double conveyor inside a closed storage shed preferably near plant boundary...	As per our arrangement we have considered storing of Gypsum insider closed shed below i.e below the vacuum belt filter area. Locating near plant boundary is not possible and difficult for conveying.. kindly confirm.	Amendment / Technical specifications are clear in this regard. Bidder may locate the Gypsum storage shed duly considering layout constraints and technical specification stipulations.
70	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Point no 98	37 of 60	Dust extraction system Type: Bag Filter type Location: Truck un-loading points, Junction Towers (limestone/ gypsum discharge & receipt points), limestone crusher house (including belt feeder & vibrating screening feeder) and lime stone/gypsum storage Shed/Silo. Lime stone received through Road shall be unloaded by Two (2) numbers Truck Tipplers each of minimum 40T capacity (Gross weight 60 T minimum) to discharge Limestone on to Box Feeder/ Surface Feeder/ Truck Unloading Hopper	Dust extraction for Truck unloading points & Limestone and Gypsum storage shed cannot be provided as it will be open area. Plain water Dust suppression can be provided for Truck unloading points and for Trippers at Shed can be provided with Trolley mounted Dust suppression system. Kindly confirm.	Bidder to comply with technical specification stipulations.
71	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Point no 95	35 of 60		Please confirm whether any shed has to be considered for Truck Unloading hopper.	Confirmed
72	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Sl. No. 140	56 of 60	Barh-1 (existing chimney)	As per the amendment Barh will not have any provision of new chimney. The existing chimney is required to be lined. NTPC to specify the estimated unit outage provision for chimney lining.	Barh units are under construction and hence shutdown will not be required for Chimney lining. Further, bidder to complete chimney lining work as per schedule indicated in BDS.
73	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Sl. No. 100	38 of 60	Bucket Elevator	We are considering bucket elevator for conveying limestone from Crusher output to Limestone storage silo and from lime stone storage silo to lime stone day silo. The rated capacity of both the bucket elevator and belt conveyor feeding to crusher house from the truck tippler/box feeder shall be 150 TPH.	Bidder understanding is in order regarding capacity of Bucket elevator / Belt conveyor.
74	General	General		Discussion on Layout	We propose to have a final discussion to freeze the layouts. As the lime stone unloading provision has been changed, all the layouts will go for a major change.	NTPC has already indicated blocks for FGD installation. Detailed discussion already carried out and explained the NTPC specification requirement. Bidder to finalise their Layout meeting the specification requirement.
75	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Sl. No. 63	25 of 60	Lara (2x800 MW) 9548-999-POM-F-001 Rev.9 (Civil Annex 7)	The space indicated in the GLP is inadequate for installation of FGD system. The following additional space is proposed for FGD system- > S 2000 to 2300 & E 325 to 375	Requested additional area shall be provided for FGD facilities.
76	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Sl. No. 63	25 of 60	Gadarwara (2x800 MW) 9572-999-POC-F-001 Rev.7 (Civil Annex 8)	NTPC to review and confirm. The space indicated in the GLP is inadequate for installation of FGD system. The following additional space is proposed for FGD system- > N 17080 to 17140 & E 17000 to 17100	Bidder to accommodate their FGD facilities within allocated space shown in Amendment No. 5 GLP .
77	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Sl. No. 63	25 of 60	Tanda (2x660 MW) 9562-999-POC-F-002 Rev.10 (Civil Annex 12)	NTPC to review and confirm. The space indicated in the GLP is inadequate for installation of FGD system. The following additional space is proposed for FGD system- > N 900 to 1100 & W 200 to 400	Area enclosed between Conv 3A/3B, cable trestle for CHP and East side of raw water pipe line may be used for FGD facilities. However, it is to be noted that this area may not be required as area already allocated is sufficient to accommodate FGD facilities.
78	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(1)	Sl. No. 65	Page 27/60	New Clause : Bidder shall utilize the area identified for FGD purpose. The area identified for FGD purpose in GLP shall be levelled and free from obstructions like sheds, trees etc. However, site clearance like removal of bushes, vegetation etc. is in Bidder's scope.	1) Bidder understands that the Site levelling is in Owner's scope. 2) Bidder understands the cutting of bushes & trees are in bidder's scope but the taking the necessary approval shall be in Owner's scope 3) Bidder understand that the owner shall provide the necessary land for FGD which will be free from obstructions(above & below the ground)	It is clarified that area identified for FGD purpose in GLP shall be levelled and free from obstructions like sheds, trees etc and will be in Owner's scope. However, site clearance like removal of bushes, vegetation etc. is in Bidder's scope. Bidder to refer specification wrt facilities underground.

TENDER NO. : PSER:SCT:NB-N-C2080:20
Lot1A Flue Gas Desulfurization Package
Clarification No.04 (Technical)

S.No.	Section/Part	Clause No.	Page No	Clause	Clarification	NTPC's Reply
79	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 90	Page 32/60	Piping for normal , piping for emergency-pump, other piping, fittings, supports, valves and specialities.....and structural steel shed for housing various equipment of Equipment cooling water system	1) Bidder understands that bidder can place other pumps along with the ECW equipment under the same shed. 2) ECW shed shall be open on all four sides, only roof will be provided with sheeting. 3) So Ventilation will not be considered for this shed.	Ventilation is not required for shed. Further, shed is to be provided along with roof sheet as per specification requirement.
80	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 109	Page 42/60	Gypsum Dewatering System & FGD control room. Slurry recirculating pumps & Oxidation blowers shall be located in a shed provided with roof sheeting.		Ventilation is not required for shed. Further, shed is to be provided along with roof sheet as per specification requirement.
81	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 142 b	Page 58/60	As per Amendment: Bidder should provide the condensate collection system such that the condensate collected shall be routed to absorber by gravity..... common storage tank for the both the units of storage capacity of 5 m3/hr of stack condensate of both the stack shall...	1) Bidder understands the storage capacity shall be 5 m3 for the common tank (for 2 units). 2) Please confirm what will be the capacity of the tank for 3rd unit (in case of three units) shall be.	Capacity shall be same for two/three units. Min 5m3/hr.
82	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 18	7 OF 60	Gypsum Dewatering system & FGD common control room & containerised room (portable cabin) for analysers. The buildings must be complete.....	Bidder proposes to use combined ball mill and dewatering building in plants where space/layout is a challenge. Bidder requests employer to confirm the same.	We have already provided sufficient space and space challenge is very subjective statement hence bidder is requested to comply with specification requirement.
83	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 19 (b)	8 of 60	Control and monitoring of air conditioning and ventilation system shall be done from FGD control system. Control and monitoring of air conditioning and ventilation system shall be done from FGD control system.	Bidder wish to clarify that Start, stop control and important parameter monitoring shall be done from FGD control system.	Bidder's understanding is correct.
84	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 19 (c)	8 of 60	Control and monitoring of air conditioning and ventilation system shall be done from FGD control system.	Bidder wish to clarify that Start, stop control and important parameter monitoring shall be done from FGD control system.	Bidder's understanding is correct.
85	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 23	9 of 60	Interplant cabling Cables crossing Railway line (if applicable) shall be laid underground through nearest culvert. Necessary statutory clearance if required shall be taken by Bidder.	Bidder would like to use same philosophy for the pipes crossing railway line. Hence bidder requests employer to allow use of existing nearest culvert for slurry/water pipe lines also.	Bidder's request may be consider only in case there is sufficient space available and no safety issue. At this point of time it can not be confirmed. In view of this bidder to consider scope as per the specification requirement.
86	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 42	16 of 60	For industrial structures, analysis for verification of mechanism shall be carried out as per IS: 1893 (Part 4):2015 for Earthquake loads.	As per IS:1893 (Part 4):2015, Bidder will carry out this analysis for verification of mechanism, only for category-1 structure (If any).	For Industrial structures, method of structural analysis (for seismic design) may be retained linear, for structure category 2 to 4.
87	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)			Single-flue chimney(s) shall be provided, except for Tanda TPP (2X660MW) and Meja TPP (2X660MW) where twin-flue Chimney shall be provided. Chimney shall be of reinforced concrete construction. There shall be one flue (liner) for each unit. The flue gas emission point for single flue chimney shall be minimum 150 meters above the plant grade level and for twin flue chimney the gas emission point shall be minimum 220m above the plant grade level. The centre to centre distance between the proposed chimney(s) and the existing chimney(s) in any direction shall not be less than 150 metres. For Barh-I (3X660MW) already existing 275m high chimneys shall be utilized with modifications as specified elsewhere in mechanical specification and hence, new chimney is not to be provided under FGD package. General Arrangement Drawing of already existing Chimneys at Barh-I are provided in Sub Section-II -A10, Part A, Section-VI for reference.	For Meja and Tanda bidder had proposed twin flue chimney in the past considering space constraint. In the latest amendment additional space have been provided by employer and it is now possible to go for single flue chimney's for each unit. Hence Bidder requests employer to allow flexibility of both options of single/twin flue chimney depending on layout.	Both options of single / twin flue chimney is allowed for Meja & Tanda.
88	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 112	43 of 60	All the slurry pumps shall be provided with motorized suction and discharge valves. In addition, flushing water lines with motorized/pneumatic valves shall be shall be taken from the process water supply. The process water lines shall be provided with pneumatic/motorized valves as per the proven practice of the Bidder.	Bidder wish to clarify that all water line (like process water, equipment seal water, blow down water, clarified water, cake & belt wash water etc) shall be provided with pneumatic/motorised valves as per the proven practice of the Bidder.	Specification requirement is clear in this regard. Bidder is requested to follow the technical specification.
				1. Kudgi (3x800 MW) 9573-999-POC-F-001 Rev.8 (Civil Annex 6)	Kudgi 3X800 MW: Considering the challenge of construction in unit#1 due to space constraint, bidder requests employer to allow Commissioning/C.O.F of unit#3 first followed by Unit#2 and Unit#1 in this sequence.	Same shall be decided during detail Engineering.
				2. Lara (2x800 MW) 9548-999-POM-F-001 Rev.9 (Civil Annex 7)		
				3. Gadarwara (2x800 MW) 9572-999-POC-F-001 Rev.7 (Civil Annex 8)		

TENDER NO. : PSER:SCT:NBN-C2080:20
Lot1A Flue Gas Desulfurization Package
Clarification No.04 (Technical)

S.No.	Section/Part	Clause No.	Page No	Clause	Clarification	NTPC's Reply
89	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No.-63	25 of 60	4. Darlipati (2x800 MW) 9549-999-POC-F-001 Rev.11 (Civil Annex 9)		
				5. Moida (2x660 MW) 9561/9575-999-POC-F-001 Rev.12		
				6. Solapur (2x660 MW)		
				9571-999-POC-F-001 Rev.6 (Civil Annex 11)		
				7. Tanda (2x660 MW)		
				9562-999-POC-F-002 Rev.10 (Civil Annex 12)		
				8. Nabinagar JV (3x660 MW) 0370-999-PO-F-001 Rev.11 (Civil Annex 13)	Nabinagar JV 3X660MW: Bidder requests employer to allow Space besides ESP control room of unit#1 for FGD use.	Bidder to note that space available between C.L. of pipe cable trestle column and ESP/VFD control room including transformer handling/withdrawal space shall be max. 15m at the ground level. Bidder may plan their FGD facilities without disturbing existing facilities/structure/foundation both above and below around in the referred area.
90	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No. 136 (Mech Annexure-IV)	54 OF 60	9. Meja (2x660 MW) 0360/0361-999-POC-F-001 Rev.8 (Civil Annex 14)		
				10. Bathi (3x660 MW) 9558/9560-999-POC-F-001 Rev.9 (Civil Annex 15)		
				11. Nabinagar (4x250MW) 0270-999-POC-F-001 Rev. 9 (Civil Annex 16)		
				Revised AUXILIARY POWER CONSUMPTION (PA) FOR EACH PROJECT is enclosed at Mech Annexure-IV		
				All the Process water tanks (Process water Storage tanks, Clarified water tank, Emergency water storage tanks etc.) shall be designed, fabricated, erected and tested in accordance with the IS: 803, latest edition. Additional Corrosion allowance of 1.5 mm on the minimum tank shell thickness as calculated by IS: 803, latest edition shall be provided by the Contractor. Tanks shall be made from IS: 2062 quality mild steel plates of tested quality. The tanks shall be of welded construction. Interior surface of the tanks shall be lined with replaceable chlorobutyl/bromobutyl rubber lining of minimum 4 mm thickness or with vinyl ester based flake glass lining of minimum 3 mm thickness or Epoxy lining minimum three coats of 150 micron thickness and the outside surface shall be coated with paint as approved by the Employer. The Tanks shall be provided with drain, manholes, over flow & inlet level control valves etc.	Bidder would like to clarify that Different units have different duct lengths and as such the guaranteed power consumption shall be different. Bidder requests employer to allow declaration of unitwise power consumption guarantees in attachment 3P (Rev-01). Further Bidder requests employer to allow declaration of unitwise guaranteed limestone consumption in the same Attachment 5P	As per the revised Auxiliary power consumption (Mechanical Annexure IV to Amendment 05(T)) Bidder to quote average Auxiliary power consumption for e.g. In case of one project is having two unit then Guaranteed APC shall be average of APC of U#1 and APC of U#2. With this provision Bidder's concern is already taken care. Bidder to guarantee Limestone consumption same for all unit as it is not dependent on layout. Bidder's understanding is correct.
					Bidder understands that the total thickness of epoxy lining/paint shall be 3X50 micron = 150 micron (Total). Bidder requests employer to confirm the same.	
91	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No. 108	41 OF 60			
92	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No. 142 C 59 OF 60		2x100% electric driven, single stage, integrally geared, single or dual vane centrifugal type / positive displacement (Helical lobe) type with VFD drive, oxidation blowers complete with integral gearbox, lube oil system, instrumentation and accessories. The blower will be used for supplying a variable volume of air to the absorber reaction tank. Mandatory Spares List (For each Project) - Cl. No. 1.01.00 to 1.17.00 revised attached as Mech Annexure III SI No 1.02.00 Gates in Flue Gas System 1. Seals 2. Expansion Joints 3. Expansion Joints 4. Seals for guilloine gate (Both port side and bonnet side) (In case Gates are provided) The absorber vessel shall be made of minimum 7 mm thick carbon steel. The absorber oxidation tank, absorber tower & absorber outlet duct up to absorber outlet flange shall be provided with 2 mm (minimum) thickness lining / cladding. Allow C276 / Alloy 59 or better material.	Bidder understands that VFD shall not be applicable for centrifugal type oxidation blower with vane control. Bidder requests employer to confirm the same.	Bidder's understanding is correct. VFD is not mandatory for centrifugal type oxidation blower
93	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No. 134	53 OF 60			
94	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No. 144	59 OF 60		Bidder understand that lining here implies wall papering as allowed in original Tender. Bidder requests employer to confirm the same.	It is clarified that only clad plated of Alloy C276/ Alloy 59 or better material with Carbon steel base is allowed. Clad plated can be manufactured by either rolling or explosion bonding process.
95	AMENDMENT NO. CS-0011-109(A)-2-AMDT-05(T)	Sl. No. 38	14 OF 60	"SITE SPECIFIC SEISMIC PARAMETERS FOR DESIGN OF STRUCTURES AND EQUIPMENT" shall replace the "SITE SPECIFIC SEISMIC PARAMETERS FOR DESIGN OF STRUCTURES AND EQUIPMENT" Amendment No.03 to Technical specification (Section-VI) (Amendment No. CS-0011-109(A)-2-AMDT-05(T)). SI.No. 1.3, Page-8 of 102	Bidder requests employer to provide the missing bore log data for all the projects. Bidder has updated missing bore log data coordinates for each project.	All Bore log data available with NTPC for that vicinity has already been provided.

Lot1A Flue Gas Desulfurization Package

Clarification No.04 (Technical)

S.No.	Section/Part	Clause No.	Page No	Clause	Clarification	NTPC's Reply
96	AMENDMENT NO. CS-0011-109(1A)-2-AMDT-05(T)	Sl. No. 140	56 OF 60	Barth-I (3X660MW) clauses and drgs revised considering that FGD outlet will be connected to existing chimney and accordingly absorber discharge will be connected to ID fan discharge duct with additional damper(s). Bypass duct from bypass damper to chimney and existing chimney shall be lined. Further, Condensate draining system and condensate study shall also be in the bidder's scope. Sketch and details are enclosed at Mechanical Annexure-VI	Bidder would like to inform that in case of Barth existing chimney can not be converted into wet stack inline with EPRI guidelines because in Barth existing stack, flue gas velocity will be higher than the EPRI recommended velocity hence it will be a deviation from EPRI guideline. Bidder also requests employer to provide the additional details of existing chimney i.e flue can drawing from breeching joint to top of stack, number of expansion joints with detail , number of platform inside existing stack etc., present conditions of flue can. Further Bidder is discussing with sub-vendors for stack conversion and will get back to employer if any additional information is required.	Bidder understanding on velocity in chimney is correct. Consider pressure drop of 40 mm through chimney or actual whichever is higher. Velocity inside the duct and chimney can be calculated based on the FGD flow at the absorber outlet. Additional data, if required, shall be provided during detail Engineering.
97			General	Mech Annex VI 1.05.00: Wet Stack condensate collection system & condensate study Existing stack shall with a draining system as per EPRI guidelines	Bidder would like to clarify that due to the Technical Amendment No 5 the bid documents (Layout , Process Flow Diagram , Technical Datasheet , Single Line Diagram, Control Over/iew Diagram) shall have a major impact and calls for revision. Bidder requests employer to advice how these changes can be incorporated during the Bidding phase. Accordingly bidder shall submit the revised Documents / Drawings.	Layout & other Amendments have been issued based on discussion with Bidders. Bidders are requested to comply with the specification requirements. Bidder shall be required to submit the revised documents/Drawings during detail engineering.
98	TECHNICAL SPECIFICATION SECTION-VI, PART-A, SUB-SECTION-V CL NO. 5.0.0 Amendment 5(T) Sr. no. 46 Mechanical Annex-VI, Dwg. no. 9558-102-PVM-F-020		9 of 26 16 of 60 18 of 19	The wet stack shall be designed as per the guidelines of EPRI Revised Wet Stack Design Guide. & Flue Gas velocity (m/s) - < 18 at Design Point For Barth-I (3X660MW) already existing 275m high chimneys shall be utilized with modifications Flue ID – 7650 mm	As per amendment 5(T), Existing chimney with fixed flue ID of 7650 mm is to be utilised with suitable modification. As per technical specification, Flue Gas velocity (m/s) - < 18 at Design Point. Considering above and Technical specification/amendment requirement of borosilicate lining, the flue gas velocity cannot be limited as specified.	Bidder understanding on velocity in chimney is correct. For draft loss, consider pressure drop of 40 mm through chimney or actual whichever is higher. Velocity inside the duct and chimney can be calculated based on the FGD flow at the absorber outlet.



COMPANY SHRIYATI RAIL BIJLEE COMPANY LTD.	COLLOCATION  NTPC Limited A COMPANY OF THE GROUP OF POWER & RENEWABLES, INDIA	PROJECT NABINAGAR THERMAL POWER PROJECT (1025244)	A
TITLE GENERAL LAYOUT PLAN	SIZE AD 1 : 4000	SHEET NO. 0270-999-POC-F-001	REC. NO. 9

Flue Gas Desuplhurisation (FGD) System Package for Lot-1A Projects

Common Bidding Document No. : CS-0011-109(1A)-2

Errata No. 01 to Section-VI

Errata No. 01 to Technical Specifications, Section-VI

Sl. No.	Clause Ref.	Amendment	
		Instead Of	Read As
1.	Project information file for Nabinagar STPP (3X660 MW), NPGCPL (Sec VI-ProjInfo-Nabinagar-A8-1)	Sec VI-ProjInfo-Nabinagar-A8-1 (pdf file) is unreadable	Replace existing pdf file Sec-VI-ProjInfo-Nabinagar-A8-1 with Sec VI-ProjInfo-Nabinagar-A8-1 (Rev-1)

DOC. No. : CS-0011-109(1A)-2-ERRATA-01 Lot-1A Projects	Flue Gas Desulphurisation (FGD) System Package for Lot-1A Projects Errata No. 01 to Section-VI	Page 1 of 1

SUB-SECTION-II-A8

PROJECT INFORMATION- NABINAGAR-I 3X660 MW

**LOT-IA PROJECTS
FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE**

**TECHNICAL SPECIFICATION
SECTION-VI
BID DOCUMENT NO.: CS-0011-109(1A)-2**

CLAUSE NO.	PROJECT INFORMATION			
1.00.00	BACKGROUND A Joint Venture Agreement was signed between NTPC and BSEB/ Govt. of Bihar on 14.02.2008 for Establishment and Operation & Maintenance of 3x660 MW capacity coal based thermal power project near Nabinagar Distt Aurangabad Bihar and thereafter a Joint Venture company namely, Nabinagar Power Generating Company Private Limited (NPGCPL) was incorporated with equity structure of 50% each by NTPC and BSEB on 09.09.2008.The project shall be a mega project and shall be implemented during XII Plan period.			
1.01.00	Location The plant is located in Aurangabad district of Bihar at a distance of about 15 kms. from Barun in Aurangabad district of Bihar and is approachable from NH-2 through a 20 kms (approx.) long single lane metalled road. The Aurangabad city is about 55 kms. from project site. Nearest railway station is Ankorha on Sone – Garwa Road Section of Eastern Central Railway at about 1.0 Kms. from the project site. Airport The nearest airport at Gaya is at a distance of about 120 Kms from project site. The distances of site from Patna Airport and Varansi Airport are about 250 Kms & 220 Kms respectively. Vicinity plan of the proposed project is placed at Annexure -I			
1.02.01	Land About 2500 acres of land required for the project (main plant, township, ash disposal areas and corridors etc.) has been identified. Govt. of Bihar have accorded in-principle clearance for availability of land vide letter dated 15.06.2007 and 27.02.2009.			
1.02.02	Coal Coal requirement for the project is estimated about 11.25 million tonnes/annum corresponding to 90% PLF. Likely coal source for the project is North Karanpura coalfields of CCL. Application for Long Term Coal Linkage has been submitted to Ministry of Coal, Govt. of India on 21.06.2007 & 06.10.2008.			
1.02.03	Water The project site is located near the river Sone and the make up water requirement for the project is proposed to be drawn from the pondage created by Indrapuri Barrage on river Son, which is about 3 kms from the proposed site. Make up water requirement for this project would be about 7550 Cu.M/hr with ash water recirculation system and about 8480 Cu.M/hr with once through ash water system.			
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 1 - OF 31

CLAUSE NO.	PROJECT INFORMATION		
1.03.00	Govt. of Bihar has accorded water commitment for availability of 125 cusecs of water vide letter dated 06.06.2007. Railway Siding Employer intends to construct the Railway siding to project site from the nearest existing railway line. However, the same may not be available to the bidder for his use to transport equipment & material. Bidder may visit the site and acquaint themselves with the facilities available.		
1.04.00	(i) Coal Quality Parameters / Fuel Oil Characteristics & Plant Water details: The coal quality parameters and Fuel oil Characteristics are indicated in Table-1 & Table-2A & 2B resp. below. Water data (ii) Process water: Source: Terminal point: Process water quality is based on COC given in Table-3. (iii) Clarified water: Terminal point: Clarified water quality is indicated in Table-3. (iv) DM water for Equipment cooling water system. Terminal point: DM water quality is indicated in Table-4.		
1.05.00	Steam Generator and ESP data: refer Table-5.		
1.06.00	Drawings are enclosed as per Table-6 for initial overview to the Bidder.		
2.00.00	NOT USED		
3.00.00	Capacity : 3 x 660 MW		
4.00.00	Metrological Data Important meteorological data from nearest observatory at Dehri is placed at Annexure -II.		
5.00.00	CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT All structures and equipment shall be designed for seismic forces adopting the site specific seismic information provided in this document and using the other provisions in accordance with IS:1893 (Part 1 to Part 4). Pending finalization		
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)
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CLAUSE NO.	PROJECT INFORMATION														
	of Part 5 of IS:1893, provisions of part 1 shall be read along with the relevant clauses of IS:1893:1984, for embankments. A site specific seismic study has been conducted for the project site. The peak ground horizontal acceleration for the project site, the site specific acceleration spectral coefficients (in units of gravity acceleration 'g') in the horizontal direction for the various damping values and the multiplying factor (to be used over the spectral coefficients) for evaluating the design acceleration spectra are as given at Appendix-I. Vertical acceleration spectral values shall be taken as 2/3rd of the corresponding horizontal values. The site specific design acceleration spectra shall be used in place of the response acceleration spectra, given at figure-2 in IS:1893 (Part 1) and Annex B of IS:1893 (Part 4). The site specific acceleration spectra along with multiplying factors specified in Appendix-I includes the effect of the seismic environment of the site, the importance factor related to the structures and the response reduction factor. Hence, the design spectra do not require any further consideration of the zone factor (Z), the importance factor (I) and response reduction factor (R) as used in the IS:1893 (Part 1 to Part 4). Damping in Structures The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for: <table><tr><td>a) Steel structures</td><td>:</td><td>2%</td></tr><tr><td>b) Reinforced Concrete structures</td><td>:</td><td>5%</td></tr><tr><td>c) Reinforced Concrete Stacks</td><td>:</td><td>3%</td></tr><tr><td>d) Steel stacks</td><td>:</td><td>2%</td></tr></table> Method of Analysis Since most structures in a power plant are irregular in shape and have irregular distribution of mass and stiffness, dynamic analysis for obtaining the design seismic forces shall be carried out using the response spectrum method. The number of vibration modes used in the analysis should be such that the sum total of modal masses of all modes considered is at least 90 percent of the total seismic mass and shall also meet requirements of IS:1893 (Part 1). Modal combination of the peak response quantities shall be			a) Steel structures	:	2%	b) Reinforced Concrete structures	:	5%	c) Reinforced Concrete Stacks	:	3%	d) Steel stacks	:	2%
a) Steel structures	:	2%													
b) Reinforced Concrete structures	:	5%													
c) Reinforced Concrete Stacks	:	3%													
d) Steel stacks	:	2%													
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 3 - OF 31												

CLAUSE NO.	PROJECT INFORMATION			
	performed as per Complete Quadratic Combination (CQC) method or by an acceptable alternative as per IS:1893 (Part 1). In general, seismic analysis shall be performed for the three orthogonal (two principal horizontal and one vertical) components of earthquake motion. The seismic response from the three components shall be combined as specified in IS:1893 (Part 1). The spectral acceleration coefficient shall get restricted to the peak spectral value if the fundamental natural period of the structure falls to the left of the peak in the spectral acceleration curve. For buildings, if the design base shear (V_B) obtained from modal combination is less than the base shear ($\bar{V}_B$) computed using the approximate fundamental period (T_a) given in IS:1893:Part 1 and using site specific acceleration spectra with appropriate multiplying factor, the response quantities (e.g. member forces, displacements, storey forces, storey shears and base reactions) shall be enhanced in the ratio of $\bar{V}_B/ V_B$. However, no reduction is permitted if $\bar{V}_B$ is less than V_B. For regular buildings less than 12m in height, design seismic base shear and its distribution to different floor levels along the height of the building may be carried out as specified under clause 7.5, 7.6 & 7.7 of IS:1893 (Part 1) and using site specific design acceleration spectra. The design horizontal acceleration spectrum value (A_h) shall be computed for the fundamental natural period as per clause 7.6 of IS:1893 (Part 1) using site specific spectral acceleration coefficients with appropriate multiplying factor given in Appendix-I. Design/Detailing for Ductility for Structures The site specific design acceleration spectra is a reduced spectra and has an in-built allowance for ductility. Structures shall be engineered and detailed in accordance with relevant Indian/International standards to achieve ductility.			
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2		SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)
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CLAUSE NO.	PROJECT INFORMATION		
	APPENDIX – I SITE SPECIFIC SEISMIC PARAMETERS FOR DESIGN OF STRUCTURES AND EQUIPMENT The various site specific seismic parameters for the project site shall be as follows: 1) Peak ground horizontal acceleration : 0.16g 2) Multiplying factor to be applied to the site specific horizontal acceleration spectral coefficients (in units of gravity acceleration ‘g’) to obtain the design acceleration spectra a) for ordinary moment resisting steel frames designed and detailed as per IS:800 : 0.04 b) for braced steel frames designed and detailed as per IS:800 : 0.03 c) for special moment resisting RC frames designed and detailed as per IS:456 and IS:13920 : 0.024 d) For RCC chimney : 0.08 e) For Liquid retaining tanks : 0.048 d) for Steel chimney and Absorber tower : 0.06 d) for design of structures not covered under 2 (a) to 2 (f) above and under 3 below : 0.04 3) Multiplying factor to be applied to the site specific horizontal acceleration spectral coefficients (in units of gravity acceleration ‘g’) for design of equipment and structures where inelastic action is not relevant or not permitted : 0.08 Note: g = Acceleration due to gravity The horizontal seismic acceleration spectral coefficients are furnished in subsequent pages.		
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 5 - OF 31

CLAUSE NO.	PROJECT INFORMATION																																																																																																																																																														
	APPENDIX – I HORIZONTAL SEISMIC ACCELERATION SPECTRAL COEFFICIENTS In units of ‘g’ for BRBCL project <table><tr><th rowspan="2">Time Period (Sec)</th><th colspan="3">Damping Factor (as a percentage of critical damping)</th></tr><tr><th>2%</th><th>3%</th><th>5%</th></tr><tr><td>0.000</td><td>1.000</td><td>1.000</td><td>1.000</td></tr><tr><td>0.030</td><td>1.000</td><td>1.000</td><td>1.000</td></tr><tr><td>0.050</td><td>1.750</td><td>1.607</td><td>1.443</td></tr><tr><td>0.100</td><td>3.737</td><td>3.060</td><td>2.374</td></tr><tr><td>0.104</td><td>3.904</td><td>3.174</td><td>2.443</td></tr><tr><td>0.123</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.150</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.200</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.250</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.300</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.350</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.400</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.450</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.500</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.516</td><td>3.904</td><td>3.401</td><td>2.753</td></tr><tr><td>0.550</td><td>3.662</td><td>3.401</td><td>2.753</td></tr><tr><td>0.600</td><td>3.357</td><td>3.142</td><td>2.753</td></tr><tr><td>0.607</td><td>3.320</td><td>3.105</td><td>2.753</td></tr><tr><td>0.670</td><td>3.006</td><td>2.813</td><td>2.493</td></tr><tr><td>0.700</td><td>2.877</td><td>2.693</td><td>2.386</td></tr><tr><td>0.750</td><td>2.685</td><td>2.513</td><td>2.227</td></tr><tr><td>0.800</td><td>2.518</td><td>2.356</td><td>2.088</td></tr><tr><td>0.850</td><td>2.369</td><td>2.218</td><td>1.965</td></tr><tr><td>0.900</td><td>2.238</td><td>2.094</td><td>1.856</td></tr><tr><td>0.950</td><td>2.120</td><td>1.984</td><td>1.758</td></tr><tr><td>1.000</td><td>2.014</td><td>1.885</td><td>1.670</td></tr><tr><td>1.050</td><td>1.918</td><td>1.795</td><td>1.590</td></tr><tr><td>1.100</td><td>1.831</td><td>1.714</td><td>1.518</td></tr><tr><td>1.150</td><td>1.751</td><td>1.639</td><td>1.452</td></tr><tr><td>1.200</td><td>1.678</td><td>1.571</td><td>1.392</td></tr><tr><td>1.250</td><td>1.611</td><td>1.508</td><td>1.336</td></tr><tr><td>1.300</td><td>1.549</td><td>1.450</td><td>1.285</td></tr><tr><td>1.350</td><td>1.492</td><td>1.396</td><td>1.237</td></tr><tr><td>1.400</td><td>1.439</td><td>1.346</td><td>1.193</td></tr><tr><td>1.450</td><td>1.389</td><td>1.300</td><td>1.152</td></tr><tr><td>1.500</td><td>1.343</td><td>1.257</td><td>1.113</td></tr><tr><td>1.550</td><td>1.299</td><td>1.216</td><td>1.077</td></tr></table>				Time Period (Sec)	Damping Factor (as a percentage of critical damping)			2%	3%	5%	0.000	1.000	1.000	1.000	0.030	1.000	1.000	1.000	0.050	1.750	1.607	1.443	0.100	3.737	3.060	2.374	0.104	3.904	3.174	2.443	0.123	3.904	3.401	2.753	0.150	3.904	3.401	2.753	0.200	3.904	3.401	2.753	0.250	3.904	3.401	2.753	0.300	3.904	3.401	2.753	0.350	3.904	3.401	2.753	0.400	3.904	3.401	2.753	0.450	3.904	3.401	2.753	0.500	3.904	3.401	2.753	0.516	3.904	3.401	2.753	0.550	3.662	3.401	2.753	0.600	3.357	3.142	2.753	0.607	3.320	3.105	2.753	0.670	3.006	2.813	2.493	0.700	2.877	2.693	2.386	0.750	2.685	2.513	2.227	0.800	2.518	2.356	2.088	0.850	2.369	2.218	1.965	0.900	2.238	2.094	1.856	0.950	2.120	1.984	1.758	1.000	2.014	1.885	1.670	1.050	1.918	1.795	1.590	1.100	1.831	1.714	1.518	1.150	1.751	1.639	1.452	1.200	1.678	1.571	1.392	1.250	1.611	1.508	1.336	1.300	1.549	1.450	1.285	1.350	1.492	1.396	1.237	1.400	1.439	1.346	1.193	1.450	1.389	1.300	1.152	1.500	1.343	1.257	1.113	1.550	1.299	1.216	1.077
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	Time Period (Sec)	Damping Factor (as a percentage of critical damping)		
		2%	3%	5%
	3.500	0.575	0.539	0.477
	3.550	0.567	0.531	0.470
	3.600	0.559	0.524	0.464
	3.650	0.552	0.516	0.458
	3.700	0.544	0.509	0.451
	3.750	0.537	0.503	0.445
	3.800	0.530	0.496	0.439
	3.825	0.527	0.493	0.437
	3.850	0.523	0.490	0.434
	3.900	0.516	0.483	0.428
	3.950	0.510	0.477	0.423
	4.000	0.504	0.471	0.418
	<u>CRITERIA FOR WIND RESISTANT DESIGN OF STRUCTURES AND EQUIPMENT</u> All structures shall be designed for wind forces in accordance with IS:875 (Part-3) and as specified in this document. See Annexure – B for site specific information. Along wind forces shall generally be computed by the Peak (i.e. 3 second gust) Wind Speed method as defined in the standard. Along wind forces on slender and wind sensitive structures and structural elements shall also be computed, for dynamic effects, using the Gust Factor or Gust Effectiveness Factor Method as defined in the standard. The structures shall be designed for the higher of the forces obtained from Gust Factor method and the Peak Wind Speed method. Analysis for dynamic effects of wind must be undertaken for any structure which has a height to minimum lateral dimension ratio greater than “5” and/or if the fundamental frequency of the structure is less than 1 Hz. Susceptibility of structures to across-wind forces, galloping, flutter, ovalling etc. should be examined and designed/detailed accordingly following the recommendations of IS:875(Part-3) and other relevant Indian standards. It should be estimated if size and relative position of other structures are likely to enhance the wind loading on the structure under consideration. Enhancement			
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	factor, if necessary, shall suitably be estimated and applied to the wind loading to account for the interference effects. Damping in Structures The damping factor (as a percentage of critical damping) to be adopted shall not be more than as indicated below for: a) Welded steel structures : 1.0% b) Bolted steel structures : 2.0% c) Reinforced concrete structures : 1.6% d) Steel stacks : As per IS:6533 & CICIND Model Code whichever is more critical. <u>ANNEXURE-B</u> <u>SITE SPECIFIC DESIGN PARAMETERS</u> The various design parameters, as defined in IS: 875 (Part-3), to be adopted for the project site shall be as follows: a) The basic wind speed “V_b” at ten b) The risk coefficient “K₁” : 1.07 c) Category of terrain : Category-2				
7.00.0	FOUNDATION SYSTEM AND GEOTECHNICAL DATA				
7.00.01	Geotechnical data and foundation system for the respective project are enclosed at annexure-III. The corresponding bore logs are enclosed at annexure-IV.				
7.00.02	The available soil data is of vicinity of proposed structures, therefore, bidder shall carryout his own detailed soil investigation for facilities under this package and shall be as per the scheme approved by owner. The scheme for geotechnical investigation shall be as given at Clause 7.07.00 and shall be approved by owner before execution. Geotechnical investigation work shall got executed by the Contractor through the agencies as mentioned in Clause No. 7.07.03. However, no time extension shall be given on account of soil investigation carried out by the Bidder. The geotechnical investigation report shall be prepared with detailed recommendations regarding type of foundation and allowable bearing pressure for various structures/ facilities and other soil parameters. The report shall be submitted for Owner’s approval prior to commencement of design of foundation.				
7.00.03	The Bidder should note that nothing extra whatsoever on account of variation between soil data collected by Owner and that found by the Bidder during geotechnical investigation by him or during execution of works, shall be payable.				
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7.00.04	Tank Foundations a) The tanks shall rest on flexible tank pad foundation, resting on sand with concrete ring wall to retain sand. Base of the concrete ring wall shall not rest on the expansive soil, if any. b) Entire loose/ soft soil inside the concrete ring wall shall be removed and shall be filled with sand. Sand for filling shall be clean and well graded conforming to IS 383 with grading Zone I to III. c) Sand shall be spread in layers not exceeding 30cm compacted thickness over the area. Each layer shall be uniformly compacted by mechanical means like plate vibrators, small vibratory rollers, etc to achieve a relative density of not less than 80%. d) Other requirements of tank foundations shall be as per IS 803 and as specified elsewhere in the specifications.
7.02.00	Foundation System The requirements for the foundation system to be adopted are as given in subsequent clauses. Depending upon the depth of competent strata/stratum, type of structures, functional requirement of facility, extent of cutting / filling, suitable foundation, open or pile shall be adopted with approval of owner.
7.02.01	General Requirements a) All structures/equipment shall be supported either on suitable open foundations (isolated, combined, raft) or pile foundations depending on type of structures/facilities, sub-strata, topography etc. b) The roads, ground floor slabs, trenches, pipe pedestals, channels/drains and staircase foundation with foundation loading intensity less than 4 T / M2 may be supported on open / shallow foundations resting on virgin / controlled compacted filled up soil. c) No other foundation (other than as mentioned in (b) above) shall rest on the filled up ground / soil. d) No foundation shall rest on the black cotton soil. e) Before execution of work the bidder shall ensure that there is no obstruction to underground/overground facilities like sewer lines, pipe lines etc. Any such damage and remedial/ rectification measures shall be at the contractors cost. f) Bidder shall also ensure that there is no damage to existing nearby foundations and the foundations pertaining to this package are not placed at shallower depth than the nearby foundations. If required depth of foundation is deeper than the existing foundations, proper protection shall be provided to existing foundations.
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7.02.02	g) All foundations shall be designed in accordance with relevant parts of the latest revisions of Indian Standards. h) The water table for design purpose shall be considered at Finished Ground Level. i) A combination of open and pile foundations shall not be permitted under the same equipment / structure / building. j) Foundation for equipments on ground floor For equipments of static weight upto 1.5 T, the equipment may be supported on the ground floor slab by locally thickening the slab. Thickening of the ground floor slab shall be done upto an extent of about 0.6 m beyond the plan area of the equipment on all the sides. Further, the load intensity below the equipment shall be limited to 4T/m2. Other requirements of floor slab and compaction below the floor slab shall be adhered, as specified elsewhere in the specifications. For equipment of static weight more than 1.5 T, the equipment foundation shall be taken to the founding level or shall be built up with PCC from the level as mentioned in the Table 1. The pedestal of equipment foundation or the foundation Block shall be isolated from the adjoining floor slab by providing bitumen impregnated fiber board of minimum 50 mm thick, conforming to IS: 1838 all around the equipment pedestal for the full depth of the floor slab.			
	Open Foundations In case open foundations are adopted, following shall be adhered to. a) The minimum width of foundation shall be 1.0 m. b) Minimum depth of foundation shall be 1.0m below Ground Level. c) It shall be ensured that all foundations of a particular structure/ buildings/ facility shall rest on one bearing stratum. d) Wherever the intended bearing sub-strata is virgin soil stratum but the actual stratum encountered during foundation excavation consists of filled up soil at founding level, under such cases either the foundation shall be lowered completely into the virgin stratum or the filled up soil upto the virgin layers shall be removed and built up through PCC (1:4:8) up to designed foundation level.			
	7.02.03	Pile Foundations – In case piles are adopted, following shall be adhered to :		
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	i) The pile foundation shall be of RCC, Cast-in-situ bored piles as per IS:2911. Pile boring shall be done using Rotary Hydraulic Rigs/conventional tripod rig. Two stage flushing of pile bore shall be ensured by airlift technique duly approved by the Employer. If required, temporary or permanent MS liner may be provided for piling. ii) The minimum diameter of pile shall be 600 mm. The allowable load capacity of the pile in different modes (vertical compression, lateral and pullout) shall be as per approved geotechnical report & as enclosed in relevant annexure: iii) Only straight shaft piles shall be used. Minimum cast length of pile above cutoff level shall be 1.0 m. iv) The contractor shall furnish design of piles (in terms of rated capacity, length, diameter, termination criteria to locate the founding level for construction of pile in terms of measurable parameter, reinforcement for job as well as test piles, pile load test arrangement, locations of initial test piles etc.) for Engineer's approval. v) The piling work shall be carried out in accordance with IS:2911 (Relevant part) and accepted construction methodology. The construction methodology shall be submitted by the Contractor for Engineer's approval. vi) Number of initial load tests to be performed for each diameter and rated capacity of pile shall be subject to minimum as under. Vertical Lateral Minimum of 2 Nos. in each mode. Uplift vii) The initial pile load test shall be conducted with test load upto three times the estimated pile capacity. In case of vertical compression test (initial test) the method of loading shall be cyclic as per IS:2911 (relevant part). viii) Load test shall be conducted at pile Cut-off Level (COL). If the water table is above the COL the test pit shall be kept dry throughout the test period by suitable de-watering methods. Alternatively the vertical load test may be conducted at a level higher than COL. In such a case, an annular space shall be created to remove the effect of skin friction above COL by providing an outer casing of suitable diameter larger than the pile diameter. ix) Number of routine pile load tests to be performed for each diameter/allowable capacity of pile shall be as under : i) Vertical : 0.5% of the total number of piles provided. ii) Lateral : 0.5% of the total number of piles provided.		
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	x) The routine tests on piles shall be conducted upto test load of one and half times the allowable pile capacity. Piles for routine load tests shall be approved by the Employer. xi) In case, routine pile load test shows that the pile has not achieved the desired capacity or pile(s) have been rejected due to any other reason, then the Contractor shall install additional pile(s) as required and the pile cap design shall accordingly be reviewed and modified, if required. xii) Testing of piles and interpretation of pile load test results shall be carried out as per IS:2911 (Part-4). Contractor shall ensure that all the measuring equipment and instruments are properly calibrated at a reputed laboratory / institute prior to their use. Settlement / movement of the pile top shall be made by Linear Variable Differential Transducers (LVDT) having a least count of 0.01mm. xiii) The test load on initial test piles shall be applied by means of reaction from anchor piles / rock anchors alone or combination of anchor piles / rock anchors and kentledge with concrete blocks. xiv) Low Strain Pile Integrity test shall be conducted on all test piles and job piles. This test shall be used to identify the routine load test and not intended to replace the use of static load test. This test is limited to assess the imperfection of the pile shaft and shall be undertaken by an independent specialist agency to be approved by Engineering department of Owner. The test equipment shall be of TNO or PDI make or equivalent. The process shall confirm to ASTM. xv) High Strain Dynamic Load Test may be carried out for routine load testing of working piles. However, at least two numbers of static routine vertical load tests shall be carried out on pile on which high strain dynamic load test has already been carried out for establishing the correlation between the two tests. In case of discrepancy if any between dynamic and static vertical load tests, then additional static routine vertical load tests shall be conducted as decided by the Engineer and the results of static routine vertical load shall prevail. Number of routine vertical pile load tests as per clause 7.02.03 (ix) shall be total of static routine vertical load test and high strain dynamic load tests. The procedure to carry out the test shall be submitted to the Engineer. The test and equipment shall conform to ASTM D4945-00. The test shall be conducted by an experienced independent test agency approved by the owner. Field data shall be submitted to the site engineer and shall include force velocity curves, pile capacity, simulated static load test curve, net and total pile displacement, pile integrity. A (Case pile wave analysis) CAPWAP or equivalent software analysis shall be conducted on the field data for correct capacity estimation and to evaluate end bearing and skin friction components		
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	of the pile. xvi) From load considerations, single pile may be used under a column/tower. In that case, pile shall be connected with tie beams at pile cut off level in both directions. xvii) Contribution of frictional resistance of filled up soil if any, shall not be considered for computation of frictional resistance of piles. xviii) Reinforcement for job piles shall be designed as following: ▮ Compression + bending piles: For these piles, the allowable safe pile capacities in compression and bending shall be considered. ▮ Tension + bending piles: For these piles, the actual pile forces to be considered. However, maximum 3 types of combinations for varying percentage of tension capacity + bending case may be designed & adopted by contractor for the entire scope of work under this package.		
7.03.00	Special Requirements		
7.03.01	Details of treatment for foundations / underground structures required to counteract soil / water chemical environment shall be as per detailed geotechnical investigation to be carried out by contractor. Contractor shall carry out chemical analysis during detailed geotechnical investigation and required treatment shall be provided accordingly.		
7.04.00	Excavation, Filling and Dewatering		
7.04.01	For excavation works, comprehensive dewatering with well point or deep wells arrangement, if required, shall be adopted. Scheme for dewatering and design with all computations and back up data for dewatering shall be submitted for the owner's information. The water table shall be maintained at 0.5m below the founding depth.		
7.04.02	Excavation for shallow foundations shall be covered with PCC immediately after reaching the founding level. In case of any local loosening of soil or any loose pockets are encountered at founding level during excavation the same shall be removed and compensated by PCC M7.5. The final layer of about 300 mm thickness above the founding level shall be excavated by suitable means, so as to avoid disturbance to founding stratum.		
7.04.03	Backfilling around foundations, pipes, trenches, sumps, pits, plinths, etc. shall be carried out with approved material in layers not exceeding 300 mm compacted thickness (higher thickness of layers upto 500mm with heavy mechanical compacting equipment) and each layer shall be compacted to 90% of standard proctor density for cohesive soils and to 80% of relative density for non-cohesive soils Rock pieces having size less than 150 mm and interstices filled with soil may be used for backfilling around foundation, plinths etc. and shall be compacted to minimum of 85% of original stack of material after filling the interstices.		
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7.04.04	Founding level for trenches/channels shall be decided as per functional requirement. The bottom of excavation shall be properly compacted prior to casting of bottom slab of trenches / channels.			
7.04.05	CBR tests for pavement/road design shall be carried out by the Contractor after earth filling (if applicable) has been completed upto the formation level.			
7.04.06	The contractor shall take all necessary measures during excavation to prevent the hazards of falling or sliding of material or article from any bank or side of such excavation which is more than one and a half meter above the footing by providing adequate piling, shoring, bracing etc. against such bank or sides.			
	Adequate and suitable warning signs shall be put up at conspicuous places at the excavation work to prevent any persons or vehicles falling into the excavation trench. No worker should be allowed to work where he may be stuck or endangered by excavation machinery or collapse of excavations or trenches.			
7.05.00	EXCAVATION IN ROCK			
	Excavation in rock shall be carried out by mechanical means and if blasting is required for founding of some of the structures under this package, control blasting only shall be carried out.			
7.05.01	Controlled blasting shall be done by a specialised agency duly approved by Engineer. All controlled blasting shall be done by using time delay detonators (i.e. excel type).			
7.05.02	a) Contractor shall engage an agency expert in blasting such as, NIRM (National Institute of Rock Mechanics), CMPDIL, Central Institute of Mining and Fuel Research Dhanbad, Dept. of Mining of Govt. Institutions etc. to design detailed blasting scheme and get the same approved from Engineer before carrying out the blasting operation. All blasting shall be done as per the approved blasting scheme & initial blasting operations shall be done under the supervision & guidance of the representative of the blasting expert. b) All the statutory laws, (Explosives Act etc.) rules, regulations, Indian Standards, etc. pertaining to the acquisition, transport, storage, handling and use of explosives, etc. shall be strictly followed. c) The Contractor shall obtain Licenses from Competent Authorities for undertaking blasting work as well as for procuring, transporting to site and storing the explosives as per explosives act. The Contractor shall be responsible for the safe transport, use, custody and proper accounting of the explosive Materials. d) The Contractor shall be responsible and liable for any accident and injury / damage which may occur to any person or property of the project or public on account of any operations connected with the storage, transportation, handling or use of explosive and blasting operations.			
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7.06.00	Sheeting & Shoring The contractor shall ascertain for himself the nature of materials to be excavated and difficulties, if any, likely to be encountered in excavation while executing the work. Sheet piling, sheeting and shoring, bracing and maintaining suitable slopes, drainage, etc. shall be provided and installed by the Contractor, to the satisfaction of the Engineer.		
7.07.00	Geotechnical Investigation The Contractor shall carry out detailed geotechnical investigation in the areas under his scope for establishing the sub-surface conditions and to decide type of foundations for the structures envisaged, construction methods, any special requirements/treatment called for remedial measures for sub-soil/ foundations etc. in view of soft sub-soils, aggressive sub-soils and water, expansive/swelling soils etc. prior to commencement of detailed design/drawings. The Contractor shall obtain the approval for the field testing scheme proposed by him from the Owner before undertaking the geotechnical investigation work.		
7.07.01.00	Scheme of geotechnical Investigation		
7.07.02.01	Field test shall include but not be limited to the following: Boreholes, Standard Penetration Test (SPT), Dynamic Cone Penetration Test (DCPT), collection of disturbed samples (DS) and undisturbed soil samples (UDS), Trial Pits (TP), Plate Load Tests (PLT), Electrical Resistivity Test (ERT), In situ field permeability tests, collection of water samples, etc.		
7.07.02.02	The diameter of borehole shall be minimum 150 mm in soil and 76 mm in rock. The diameter of UDS sampler shall be 100 mm minimum. Core drilling in rock shall be done by using hydraulically feed rotary drill & double tube core barrel with diamond bit.		
7.07.02.03	The minimum tests are indicated in Clause No. 7.08.00. Adequate number of tests shall be conducted up to sufficient depth for complete determination of subsoil conditions. The depth of boreholes shall be as specified in Appendix A. SPT shall be carried out in all types of soil deposits and in all rock formations with core recovery up to 20%, met within a borehole. This test shall be conducted at every 3.0 m interval or at change of strata, up to the final depth. SPT 'N' of 100 and above shall be referred as refusal. UDS shall be collected at every 3.0 m interval or at change of strata up to depth of borehole. UDS may be replaced by additional SPT, if SPT 'N' value in the strata is above 50.		
7.07.02.04	Laboratory tests shall be done as per relevant IS codes. The laboratory tests, not be limited to the following shall be conducted on disturbed and undisturbed soil samples, rock samples & water samples collected during field investigations in sufficient numbers. Laboratory Tests on Soil Samples Laboratory tests shall be carried out on disturbed and undisturbed soil samples for Grain Size Analysis, Hydrometer Analysis, Atterberg Limits, Triaxial Shear Tests (UU), Natural Moisture Content, Specific Gravity and Bulk Unit Weight, Consolidation Tests, Unconfined Compression Test, Free swell Index, Shrinkage Limit, Swell		
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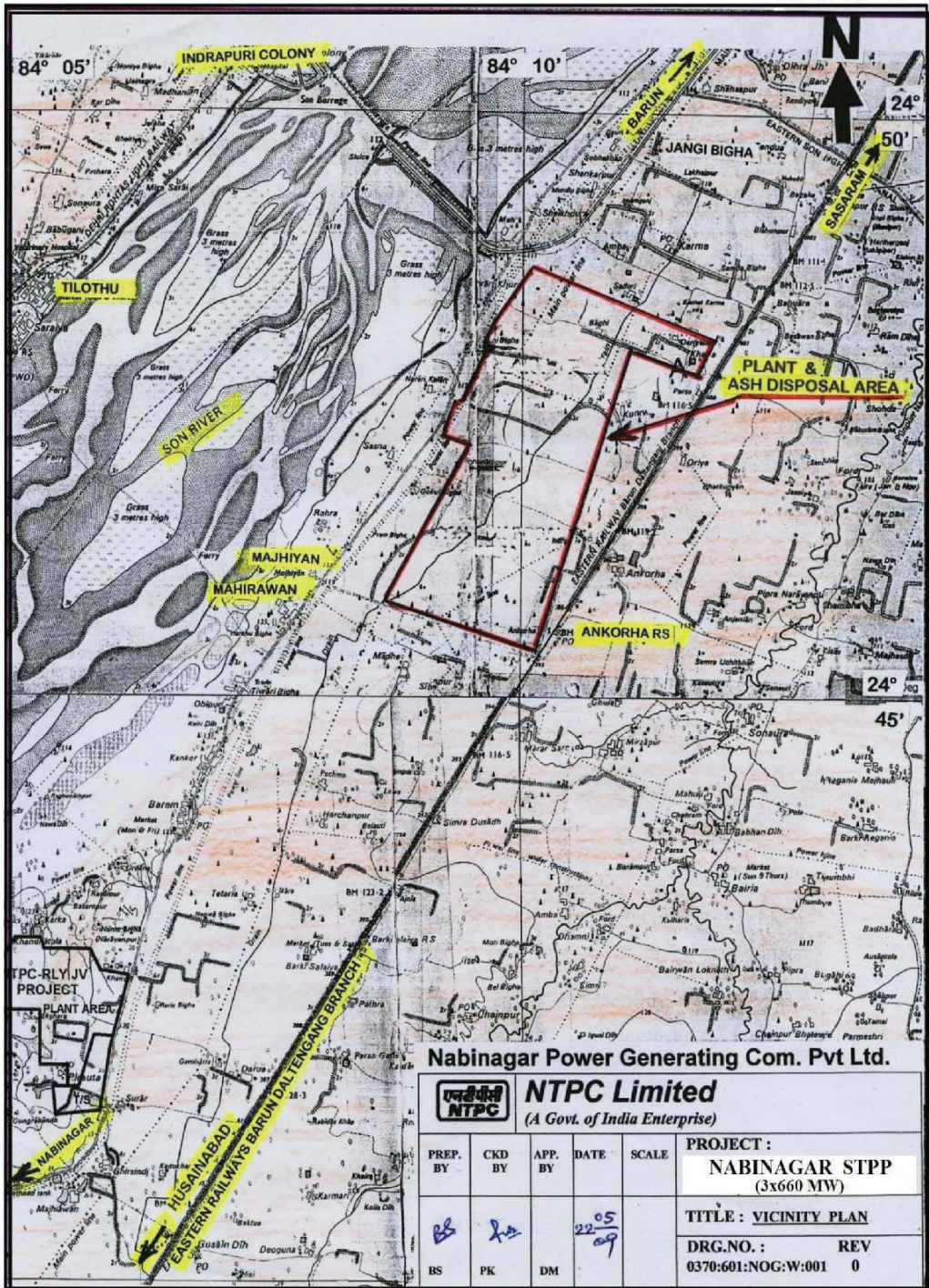
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	Pressure Test, Chemical Analysis test on soil and water samples to determine the carbonates, sulphates, chlorides, nitrates, pH, organic matter and any other chemicals harmful to concrete and reinforcement/ steel. Laboratory Tests on Rock Samples Moisture content, porosity & density, Specific Gravity, Hardness, Soundness, Slake durability index, Unconfined compression test (Both at saturated and in-situ water content), Point load strength index and deformability test (Both at saturated and in-situ water content) shall be carried out on rock samples.													
7.07.02.05	Geotechnical investigation (field & laboratory) shall be carried out in accordance with the provisions of relevant Indian Standards. On completion of all field & laboratory work, geotechnical investigation report shall be submitted for Owner's review/approval. The Geotechnical investigation report shall contain geological information of the region, procedure adopted for investigation, field & laboratory observations/ data/ records, analysis of results & recommendations on type of foundation for different type of structures envisaged for all areas of work with supporting calculations. Recommendations on treatment for soil, foundation, based on subsoil characteristics, soft soils, aggressive chemicals, expansive soils, etc. Recommendations on foundation system and the net allowable bearing pressures and pile capacity shall be based on the conservative values of geotechnical investigation data.													
7.07.03.00	Geotechnical investigation work shall be got executed by the Contractor through the following agencies. 1. C.E.TESTING COMPANY Pvt. Ltd, Kolkata 2. Cengrs Geotechnica Pvt. Ltd, New Delhi 3. M.K. Soil Testing Laboratory, Ahemdabad 4. SECON Pvt Ltd, Bangalore 5. Soil Engineering Consultants, New Delhi 6. Orbital Infrastructure Consultancy & Research Pvt. Ltd. Cuttack 7. KCT Consultancy Services, Ahemdabad 8. ARKITECHNO Consultants (India) Pvt. Ltd. Bhubaneswar													
7.08.00	Geotechnical Investigation Scheme													
a)	Boreholes (Minimum) <table border="1"> <thead> <tr> <th>S.N</th><th>Structure</th><th>Spacing/Number of borehole</th><th>Depth of borehole</th><th>Remarks</th></tr> </thead> <tbody> <tr> <td>1</td><td>FGD</td><td>Minimum 14 Nos.</td><td>Depth of boreholes shall be 25m to 35m.</td><td>Depth of</td></tr> </tbody> </table>				S.N	Structure	Spacing/Number of borehole	Depth of borehole	Remarks	1	FGD	Minimum 14 Nos.	Depth of boreholes shall be 25m to 35m.	Depth of
S.N	Structure	Spacing/Number of borehole	Depth of borehole	Remarks										
1	FGD	Minimum 14 Nos.	Depth of boreholes shall be 25m to 35m.	Depth of										
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	2	Crusher House	Minimum 2 Nos.	Depth of boreholes shall be 25m to 35m.	boreholes shall be as mentioned in column "Depth of Borehole" or 5m continuous in rock with RQD > 25% whichever is earlier.
	3	Gypsum and Lime storage area	Minimum 10 Nos.	Depth of boreholes shall be 15m to 25m	
	4	Other Structure/Facility	Minimum 2 Nos. boreholes under each area / facility	15 to 20 m	
	5	Chimney	Minimum 2 Nos.	30 to 35m	
	b) Other Field Tests (Minimum)				
	1	Cyclic Plate Load Test (CPLT)	3 nos	Test Depth from 2 to 4 m	
	2	Trial Pit (TP)	5 Nos.	Depth - 3 m	
	3	In Situ Permeability Test In Boreholes	In minimum 3 Nos. of boreholes	Tests shall be conducted at depths of 1.0m, 3.0m, 5.0m, 8.0m and 12.0m.	
	4	ERT	Minimum 10 Nos.		
	• Depth and location of Boreholes and other field tests (PLT, ERT, field permeability tests etc.) shall be approved by Owner before execution of geotechnical investigation work. • Investigation in any other building / structure / facilities / trestles which are not mentioned above shall also be carried out, if required, by the bidder for the facilities under his scope.				
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	Annexure-III (New Nabinagar-I) SOIL DATA AND FOUNDATION SYSTEM Employer has carried out geotechnical investigation in the areas near to this package. Logs of representative boreholes to be used for bidder’s information in the vicinity of proposed area are enclosed at Annexure-II. The bidder is required to carry out geotechnical investigation as per clause no. 7.07.00 and ascertain the pile capacity and bearing capacity. The onus of correct assessment / interpretation and understanding of the existing subsoil condition / data is on the Bidder. Ground water table is encountered at a depth of about 12.0 to 14.0m below natural ground level (NGL) at the time of investigation. Fluctuation may occur in ground water table due to seasonal variation. The natural ground level is varying as per enclosed contour/spot level drawing. a) The foundation system to be adopted for different structures shall be as given in Table – 1 below 2.00.00Table – 1: Net Allowable Bearing Pressure <table><tr><th>STRUCTURE</th><th>TYPE OF FOUNDATION TO BE ADOPTED</th></tr><tr><td>FGD and related structures</td><td>Open/Piles</td></tr></table> b) During design the Allowable Bearing Pressure shall be as furnished in Table-2. Bidder is required to carry out geotechnical investigation in this area. The allowable bearing pressure shall be adopted after approval of geotechnical investigation report by owner. However, the maximum allowable bearing pressure shall be as per the approved geotechnical report and shall be limited to the values as furnished in Table-2. 3.00.00 4.00.00Table – 2: Net Allowable Bearing Pressure <table><tr><th rowspan="3">Structure</th><th rowspan="3">Foundin g Level in RL</th><th colspan="3">Net Allowable Bearing Pressure T/m²</th></tr><tr><th colspan="2">Isolated / Strip</th><th rowspan="2">Rafts (width > 6m) for 75mm settlement</th></tr><tr><th>width upto 6 m for 25mm settlement</th><th>Width upto 6m for 40mm settlement</th></tr><tr><td rowspan="2">FGD and related structures</td><td>1.5 m below NGL</td><td>5.0</td><td>6.0</td><td>7.0</td></tr><tr><td>2.5 m below</td><td>6.0</td><td>7.0</td><td>8.0</td></tr></table>	STRUCTURE	TYPE OF FOUNDATION TO BE ADOPTED	FGD and related structures	Open/Piles	Structure	Foundin g Level in RL	Net Allowable Bearing Pressure T/m ²			Isolated / Strip		Rafts (width > 6m) for 75mm settlement	width upto 6 m for 25mm settlement	Width upto 6m for 40mm settlement	FGD and related structures	1.5 m below NGL	5.0	6.0	7.0	2.5 m below	6.0	7.0	8.0
STRUCTURE	TYPE OF FOUNDATION TO BE ADOPTED																							
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FGD and related structures	1.5 m below NGL	5.0	6.0	7.0																				
	2.5 m below	6.0	7.0	8.0																				
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 19 - OF 31																					

CLAUSE NO.	PROJECT INFORMATION				
<					

CLAUSE NO.	PROJECT INFORMATION															
	Cement Type Concrete Grade Type of Reinforcement Cover to Reinforcement Ordinary Portland Cement (OPC)/Portland Pozzolana Cement (PPC) As specified elsewhere in the specifications As specified elsewhere in the specifications As specified elsewhere in the specifications The termination level of the pile shall be decided based on the following criterion i) Minimum length of the pile below COL (cut off level) shall be as specified above ii) The minimum pile length for each group of piles shall be determined based on the nearest borelog. A minimum embedment of 4.0m into the very dense sand strata with SPT 'N' value greater than 40 as observed in such borelog shall be ensured, while deciding the minimum length of pile. For pile termination, SPT 'N' values shall be used from the nearby borelog data. The boreholes are in the bidder's scope and shall be conducted as per the enclosed scheme. iii) However, in no case the length of pile shall be less than the minimum length determined as in (i) or (ii) above whichever is longer, for that pile group. g) Special Requirements: 1) Chemicals in ground water and subsoil, as observed during investigation are: <table><tr><th>Chemical</th><th>SO₃</th><th>Chlorides</th><th>pH</th></tr><tr><td>Ground Water</td><td>35 -40</td><td>15 - 22 ppm</td><td>7.2 - 7.7</td></tr><tr><td>Sub-soil</td><td>0.01 - 0.02%</td><td>0.016 -0.02%</td><td>7.0 - 9.0</td></tr></table> 2) In view of the above, the following shall be adopted for all foundations and sub-structures,				Chemical	SO ₃	Chlorides	pH	Ground Water	35 -40	15 - 22 ppm	7.2 - 7.7	Sub-soil	0.01 - 0.02%	0.016 -0.02%	7.0 - 9.0
Chemical	SO ₃	Chlorides	pH													
Ground Water	35 -40	15 - 22 ppm	7.2 - 7.7													
Sub-soil	0.01 - 0.02%	0.016 -0.02%	7.0 - 9.0													
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 21 - OF 31												

CLAUSE NO.	PROJECT INFORMATION												
	ANNEXURE – I EXHIBIT - 1  Nabinagar Power Generating Com. Pvt Ltd. <table><tr><td colspan="5"> NTPC Limited (A Govt. of India Enterprise)</td><td>PROJECT : NABINAGAR STPP (3x660 MW)</td></tr><tr><td>PREP. BY BS</td><td>CKD BY PK</td><td>APP. BY DM</td><td>DATE 22/05/09</td><td>SCALE</td><td>TITLE : VICINITY PLAN DRG.NO. : 0370:601:NOG:W:001 REV 0</td></tr></table>	 NTPC Limited (A Govt. of India Enterprise)					PROJECT : NABINAGAR STPP (3x660 MW)	PREP. BY BS	CKD BY PK	APP. BY DM	DATE 22/05/09	SCALE	TITLE : VICINITY PLAN DRG.NO. : 0370:601:NOG:W:001 REV 0
 NTPC Limited (A Govt. of India Enterprise)					PROJECT : NABINAGAR STPP (3x660 MW)								
PREP. BY BS	CKD BY PK	APP. BY DM	DATE 22/05/09	SCALE	TITLE : VICINITY PLAN DRG.NO. : 0370:601:NOG:W:001 REV 0								
LOT-1A PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 22 - OF 31										

PROJECT INFORMATION

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PROJECT INFORMATION

ANNEXURE - I
SHEET 2 OF 2

जलवायवी सारणी
CLIMATOLOGICAL TABLE

STATION: Dehri

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010

PAGE - 24 - OF 31

CLAUSE NO.	PROJECT INFORMATION						
	TABLE – 1						
	COAL CHARACTERISTICS						
	Sl. No.	Description	Symbol	Design Coal	Worst Coal	Best Coal	Range of Adequacy Coal
	1	2	3	4	5	6	7
	A.	PROXIMATE ANALYSIS (As received basis)					
	1.	Total Moisture	%	15.00	17.00	12.00	11.00-17.00
	2.	Ash	%	45.00	48.00	38.00	36.00-49.00
	3.	Volatile matter	%	18.00	17.00	22.00	23.00-17.00
	4.	Fixed carbon	%	22.00	18.00	28.00	30.00-17.00
	B.	ULTIMATE ANALYSIS (As received basis)					
	1.	Carbon	C%	29.80	25.40	39.00	41.20-24.90
	2.	Hydrogen	H2%	3.00	2.80	3.20	3.30-2.60
	3.	Nitrogen	N2%	0.8	0.70	1.00	1.30-0.50
	4.	Oxygen (By difference)	O2%	5.4	5.10	5.70	6.00-5.00
	5.	Sulphur	S%	0.3	0.50	0.20	0.20-0.60
	6.	Carbonates	CO3%	0.50	0.40	0.60	0.70-0.30
	7.	Phosphorous	P2%	0.2	0.10	0.30	0.30-0.10
	8.	Total Moisture	H2O%	15.00	17.00	12.00	11.00-17.00
	9.	Ash	%	45.00	48.00	38.00	36.00-49.00
	10.	Gross Calorific Value	KCal/Kg	3200	2800	4000	4200 - 2700
	11.	Hard grove index		55	50	60	65-45
	12.	YGP Index		70	80	60	85-55
	C.	ASH ANALYSIS					
	1.	Silica	(SiO2)%	58.65	59.00	58.20	56.9-59.20
	2.	Alumina	(Al2O3)%	28.80	28.00	29.50	27.70-30.00
	3.	Iron Oxide	(Fe2O3)%	5.50	6.00	4.70	4.50-6.50
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE			TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2		SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)		PAGE - 25 - OF 31

CLAUSE NO.	PROJECT INFORMATION						
	Sl. No.	Description	Symbol	Design Coal	Worst Coal	Best Coal	Range of Adequacy Coal
	1	2	3	4	5	6	7
	4.	Titania	(TiO ₂)%	1.80	2.00	1.70	1.50-2.10
	5.	Phosphoric Anhydride	(P ₂ O ₅)%	0.70	0.60	0.90	0.40-0.95
	6.	Lime	(CaO)%	1.50	1.20	1.90	1.00-2.10
	7.	Magnesia	(MgO)%	1.30	1.50	1.20	1.50-2.10
	8.	Sulphuric Anhydride	(SO ₃)%	0.50	0.60	0.40	0.40-0.62
	9.	Sodium Oxide	(Na ₂ O)%	0.10	0.08	0.30	0.35-0.08
	10.	Balance Alkalies (By Difference)	%	1.15	1.02	1.2	1.20-0.90
	D.	ASH FUSION RANGE (Under reducing atmosphere)					
	a)	Initial Deformation Temperature (IDT)	°C	1100	1100	1100	1150-1100
	b)	Hemispherical temperature	°C	1300	1250	1350	1400-1250
	c)	Flow temperature	°C	1400	1400	1400	1400-1400
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE				TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2		SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	
						PAGE - 26 - OF 31	

CLAUSE NO.	PROJECT INFORMATION				
	TABLE – 2A				
	FUEL OIL CHARACTERISTICS				
	Sl. No.	Characteristics	Heavy Furnace Oil grade HV (HFO) IS-1593-1982	Low Sulphur Heavy Stock (LSHS) IS-11489-1985	Heavy Petroleum stock (HPS) IS-11489-1985
	1.	Total sulphur content	4.5% Max.	1.0% Max.	4.5% Max.
	2.	Gross calorific value (KCal/kg)	of the order of 10,000	of the order of 10,000	of the order of 10,000
	3.	Flash Point (Min)	66 deg C	76 deg C	66 deg C
	4.	Water content by volume (Max)	1.0%	1.0%	1.0%
	5.	Sediment by weight (Max)	0.25%	0.25%	0.25%
	6.	Asphaltene content by weight (Max.)	2.5%	2.5%	2.5%
	7.	Kinematic viscosity in Centistokes	370 at 50deg C	100 at 100deg C	100 at 100deg C
	8.	Ash Content by weight (Max.)	0.1%	0.1%	0.1%
	9.	Acidity (inorganic)	Nil	Nil	Nil
	10.	Pour Point (Max.)	57 deg C	66 deg C	72 deg C
	11.	Sodium content	—	—	100 ppm
	12.	Vanadium content	25 ppm	25ppm	25 ppm
	13.	Specific heat below pour point (KCal/Kg °C)		0.65	
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 27 - OF 31	

CLAUSE NO.	PROJECT INFORMATION			
	TABLE – 2B			
	LIGHT DIESEL OIL CHARACTERISTICS			
	AS PER IS 1460-2000			
	Characteristics		LDO	
	1.	Pour Point (max)	21 deg.C & 12°C for Summer and Winter respectively	
	2.	Kinematic viscosity in centistokes at 40 deg.C	2.5 to 15.7	
	3.	Sediment percent by mass (max)	0.10	
	4.	Total sulphur percent by mass (max)	1.8	
	5.	Ash percentage by mass (max)	0.02	
	6.	Carbon residue (Rans bottom) percent by pass (max.)	1.50	
	7.	Acidity in organic	Nil	
	8.	Flash point(Min.) - Pensky Martens	66 deg.C	
	9.	Copper strip corrosion for 3 hours at 100°C	Not worse than No. 2	
10.	Water content, % by volume(max)	0.25		
11.	GCV (Kcal/kg)	10,000		
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 28 - OF 31

CLAUSE NO.	PROJECT INFORMATION			
	Table-3			
	S.No	Constituent	As	mg/l (except pH & turbidity)
	1.	Calcium	CaCO ₃	131
	2.	Magnesium	CaCO ₃	52
	3.	Sodium + Potassium	CaCO ₃	65
	4.	Total Cations	CaCO ₃	248
	5.	Chloride	CaCO ₃	20
	6.	Sulphate	CaCO ₃	93
	7.	Nitrate	CaCO ₃	10
	8.	Alkalinity	CaCO ₃	125
	9.	Total Anions	CaCO ₃	248
	10.	Iron(total)	Fe	0.3
	11.	Total Silica	SiO ₂	22
	12.	pH value	---	7.0-8.2
	13.	Turbidity	NTU	10
Note: Clarified water is used for CW system as make up & the CW system is expected to operate at about 5.0 – 5.5 Cycles of Concentration (COC) with suitable chemical treatment program using acid, scale & corrosion inhibitor dosing. As CW blow down water is tapped from CW system, the water quality of CW blow down shall accordingly be arrived by the bidder.				
Table-4				
ANALYSIS OF DM WATER TO BE USED FOR MAKE-UP WATER TO CONDENSER				
SI.No. Characteristics		Value		
1.	Silica (Max.)	0.02 ppm as Sio2		
2.	Iron as Fe	Nil		
3.	Total hardness	Nil		
4.	pH value	6.8 -7.2		
5.	Conductivity	Not more than 0.1 micro mhos/cm excluding the effects of free CO2		
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)	PAGE - 29 - OF 31

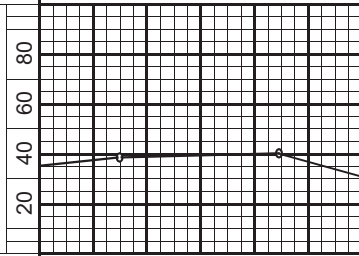
CLAUSE NO.	PROJECT INFORMATION		
9.00.00	Table-5 STEAM GENERATOR DATA		
	1.	Location	Outdoor
	2.	Operation	Base load
	3.	Type	Pulverised coal fired
	4.	Maximum Continuous Rating	2120 Tons/hr.
	5.	Steam pressure at SH outlet	255 Kg/cm ² (a)
	6.	Steam temperature at SH outlet	568°C
	7.	Oil for start-up and flame stabilisation	HFO/LSHS/HPS/LDO
	8.	Fuel oil system sizing	30% of Boiler MCR for Heavy oil/LSHS/HPS (7.5% BMCR for LDO)
	9.	Pulverised coal size	Minimum 70% through 200 Mesh and 99% thru 50 mesh
	10.	Type of pulveriser	Vertical spindle mills
	11.	Type of oil burners	Steam atomised, (Air atomised for LDO)
	12.	No. of air heaters	Two Bisector(2) for the secondary air side & Two Bisector(2) for the primary air side
	13.	No. of ID Fans	Two (both working)
10.00.00	ESP DATA		
	1.	Location:	Downstream side of Air preheaters
	2.	Operation:	Base load
	3.	Type:	Rigid Discharge frame
	4.	Rapping:	Intermittent
LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2	SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)
PAGE - 30 - OF 31			

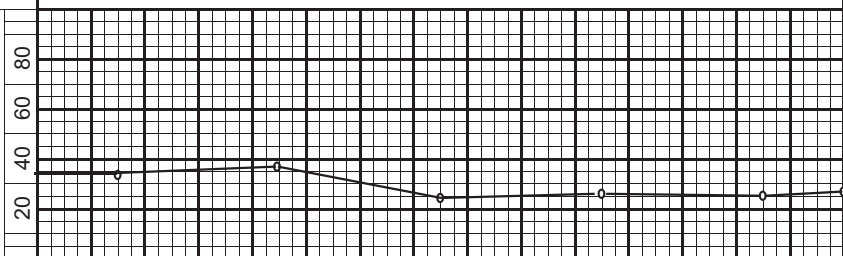
CLAUSE NO.	PROJECT INFORMATION																																																																												
	Table-6 List of Drawings placed below in this sub section: <table><tr><th>Sl.No.</th><th colspan="3">Drawing Description</th><th colspan="3">Drawing No.</th></tr><tr><td>1.</td><td colspan="3">General Layout Plan</td><td colspan="3">Enclosed</td></tr><tr><td>2.</td><td colspan="3">Equipment Layout Plan</td><td colspan="3">Enclosed</td></tr><tr><td>3.</td><td colspan="3">ID system-Elevation & Plan</td><td colspan="3">Enclosed</td></tr><tr><td>4.</td><td colspan="3">Pipe Cable Trestle Layout</td><td colspan="3">Enclosed</td></tr><tr><td>5.</td><td>Pipe</td><td>Cable</td><td>Trestle</td><td colspan="3">Foundation</td><td>Enclosed</td></tr><tr><td>6.</td><td colspan="6">Chimney foundation details</td></tr><tr><td></td><td></td><td>Chimney shell outer diameter at ground level (m)</td><td>Chimney foundation outer diameter (m)</td><td>Type of foundation</td><td>Level of Top of foundation (m)</td><td>Level of Bottom of foundation (m)</td></tr><tr><td></td><td>Unit #1</td><td>32</td><td>46.7</td><td>Raft supported on piles</td><td>RL(+) 120.20</td><td>RL(+) 115.95</td></tr><tr><td></td><td>Unit #2&3</td><td>34.5</td><td>51.22</td><td>Raft supported on piles</td><td>RL(+) 120.20</td><td>RL(+) 115.70</td></tr></table>						Sl.No.	Drawing Description			Drawing No.			1.	General Layout Plan			Enclosed			2.	Equipment Layout Plan			Enclosed			3.	ID system-Elevation & Plan			Enclosed			4.	Pipe Cable Trestle Layout			Enclosed			5.	Pipe	Cable	Trestle	Foundation			Enclosed	6.	Chimney foundation details								Chimney shell outer diameter at ground level (m)	Chimney foundation outer diameter (m)	Type of foundation	Level of Top of foundation (m)	Level of Bottom of foundation (m)		Unit #1	32	46.7	Raft supported on piles	RL(+) 120.20	RL(+) 115.95		Unit #2&3	34.5	51.22	Raft supported on piles	RL(+) 120.20	RL(+) 115.70
Sl.No.	Drawing Description			Drawing No.																																																																									
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LOT-IA PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-0011-109(1A)-2		SUB SECTION-II-A8 PROJECT INFORMATION NABINAGAR STPP-I (3X660MW)		PAGE - 31 - OF 31																																																																							

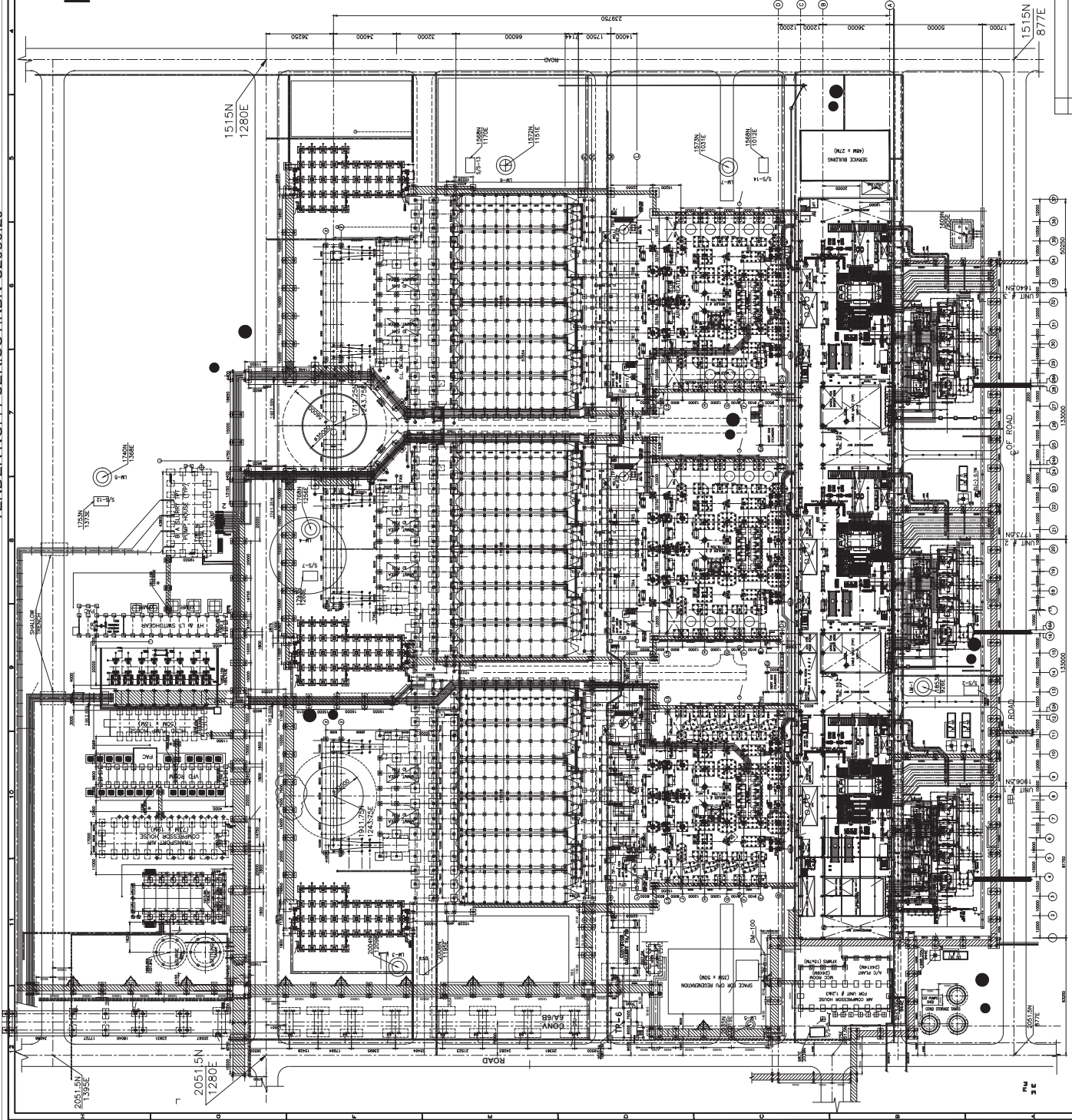
TYPE OF SAMPLES	DEPTH BELOW NGL (m)	SUB SOIL PROFILE	SOIL DESIGNATION AND ITS CLASSIFICATION	SPT 'N' VALUES	PLOT OF SPT 'N' VALUES		GRAIN SIZE DISTRIBUTION	ATTERBERGS' LIMIT				DENSITY (gm/cm ³)		WATER TABLE (m)			LOCATION	SHEET	ANNEX.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
					Recorded	Corrected		SAND (%)	SILT (%)	CLAY (%)	LIQUID LIMIT	PLASTIC LIMIT	SHRINKAGE LIMIT	BULK DENSITY	DRY DENSITY	NATURAL MOISTURE CONTENTS (%)				SPECIFIC GRAVITY	FREE SWELLING	RELATIVE DENSITY	COHESION C (Kg/cm ²)	FRICTION ANGLE ϕ	SHEAR PARA - METER	CONSOLI-DATION PARAMTR.	VOID RATIO e_0	COMPRESSION INDEX C_c	SWELLING PRESSURE (kg/cm ²)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
UDS	16.0	Dark grey silty clay with kankar of medium plasticity (CI)		38	44																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

	The Designers' Consortium		SOIL PROFILE	NTPC LTD.	Geotechnical Investigation for New Nabinagar STPP (4x660MW)	COORDINATE 570N 2230E Elev. 120.501	Depth of Boring (m) 25.0	DATE from 4/6/2009 to 12/6/2009	WATER TABLE (m) 13.70		LOCATION BH-24	SHEET 57	ANNEX. 'A'														
	DEPTH BELOW NGL (m)	SUB SOIL PROFILE	SOIL DESCRIPTION AND ITS CLASSIFICATION		PLOT OF SPT 'N' VALUES Recorded x x x x Corrected o o o o	GRAIN SIZE DISTRIBUTION			ATTERBERGS' LIMIT		DENSITY (gm/cm ³)	NATURAL MOISTURE CONTENTS (%)	SPECIFIC GRAVITY	FREE SWELLING	RELATIVE DENSITY	SHEAR PARA - METER		CONSOLI-DATION PARAMTR.	VOID RATIO e ₀	COMPRESSION INDEX C _c	SWELLING PRESSURE (kg/cm ²)						
TYPE OF SAMPLES						SPT 'N' VALUES	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SHRINKAGE LIMIT	BULK DENSITY	DRY DENSITY				COHESION C (Kg/cm ²)	FRICTION ANGLE φ						
UDS SPT	1.0 2.0		Dark grey silty clay with kankar of high plasticity (CH)		19		6	13	66	15	63	34	29	14	1.84	1.59	15.7	2.68	45		0.65	0	0.69	0.135	0.15		
SPT	3.0				30		31	34	36	38	40	42	44														
	4.0																										
SPT	5.0		Dark grey silty clay with kankar of medium plasticity (CI)				4	12	77	7	38	28	10	9					34								
UDS SPT	6.0 7.0																										
SPT	8.0																										
SPT	9.0																										
UDS	10.0																										
SPT	11.0																										
SPT	12.0																										
UDS	13.0																										
SPT	14.0																										
SPT	15.0																										

TYPE OF SAMPLES	DEPTH BELOW NGL (m)	SUB SOIL PROFILE	The Designers' Consortium	SOIL PROFILE	NTPC LTD.	Geotechnical Investigation for New Nabinagar STPP (4x660MW)	COORDINATE 570N 2230E Elev. 120.501	Depth of Boring (m) 25.0	DATE from 4/6/2009 to 12/6/2009	WATER TABLE (m) 13.70	LOCATION BH-24	SHEET 58	ANNEX. 'A'							
PLOT OF SPT 'N' VALUES																				
Recorded x x x x Corrected o o o o																				
SPT 'N' VALUES																				
GRAVEL (%)																				
SAND (%)																				
SILT (%)																				
CLAY (%)																				
LIQUID LIMIT																				
PLASTIC LIMIT																				
PLASTIC INDEX																				
SHRINKAGE LIMIT																				
BULK DENSITY																				
DRY DENSITY																				
NATURAL MOISTURE CONTENTS (%)																				
SPECIFIC GRAVITY																				
FREE SWELLING																				
RELATIVE DENSITY																				
COHESION C (Kg/cm ²)																				
FRICTION ANGLE ϕ																				
VOID RATIO e_0																				
COMPRESSION INDEX C_c																				
SWELLING PRESSURE (kg/cm ²)																				
UDS	16.0		Dark grey silty clay with kankar of medium plasticity (CI)		SPT 'N' VALUES	38	0	91	9	0	NON-PLASTIC	1.89	1.61	17.4	2.66	0.00	32	0.65		
SPT	17.0					42						52/28	55/28	56/29						
SPT	18.0					47														
UDS	19.0																			
SPT	20.0																			
SPT	21.0		Greyish poorly graded fine silty sand (SP-SM)		SPT 'N' VALUES		0	91	9	0	NON-PLASTIC									
UDS	22.0																			
SPT	23.0																			
UDS	24.0																			
SPT	25.0																			

TYPE OF SAMPLES	The Designers' Consortium	SOIL PROFILE	NTPC LTD.	Geotechnical Investigation for New Nabinagar STPP (4x660MW)	COORDINATE 625N 1980E Elev. 120.502	Depth of Boring (m) 30.0	DATE from 14/7/2009 to 16/7/2009	WATER TABLE (m) NIL			LOCATION BH-25	SHEET 60	ANNEX. 'A'											
								NATURAL MOISTURE CONTENTS (%)	SPECIFIC GRAVITY	FREE SWELLING														
UDS	DEPTH BELOW NGL (m)	SUB SOIL PROFILE	SOIL DESCRIPTION AND ITS CLASSIFICATION	SPT 'N' VALUES	PLOT OF SPT 'N' VALUES Recorded x x x Corrected o o o	GRAIN SIZE DISTRIBUTION			ATTERBERGS' LIMIT			DENSITY (gm/cm ³)		RELATIVE DENSITY	SHEAR PARA - METER		CONSOLIDATION PARAMTR.		SWELLING PRESSURE (kg/cm ²)					
						GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	SHRINKAGE LIMIT		BULK DENSITY	DRY DENSITY	COHESION C (Kg/cm ²)	FRICITION ANGLE ϕ		VOID RATIO e_0	COMPRESSION INDEX C_p			
UDS	16.0	Dark grey silty clay with kankar of medium plasticity (CI)		39		7	15	73	5	38	23	15	9	1.85	1.58	17.1	2.66	34		0.25	17	0.68	0.118	0.1
SPT	17.0																							
SPT	18.0																							
UDS	19.0																							
SPT	20.0																							
SPT	21.0	Brownish poorly graded medium to coarse sand (SP)		41		7	15	45/23	23.0	45/23	23.0	47/23	23.0	49/25	23.0	54/26			0.00	33				
UDS	22.0																							
SPT	23.0																							
UDS	24.0																							
SPT	25.0																							
SPT	26.0																							
SPT	27.0																							
UDS	28.0																							
SPT	29.0																							
SPT	30.0																							

	The Designers' Consortium		SOIL PROFILE	NTPC LTD.	Geotechnical Investigation for New Nabinagar STPP (4x660MW)		COORDINATE 850N 1965E Elev. 120.246		Depth of Boring (m) 30.0		DATE from 30/6/2009 to 5/7/2009		WATER TABLE (m) NIL			LOCATION BH-26	SHEET 62	ANNEX. 'A'										
	DEPTH BELOW NGL (m)	SUB SOIL PROFILE	SOIL DESCRIPTION AND ITS CLASSIFICATION		SPT 'N' VALUES	PLOT OF SPT 'N' VALUES Recorded x x x x Corrected o o o o				GRAIN SIZE DISTRIBUTION				ATTERBERGS' LIMIT			DENSITY (gm/cm ³)		NATURAL MOISTURE CONTENTS (%)	SPECIFIC GRAVITY	FREE SWELLING	RELATIVE DENSITY	SHEAR PARA - METER		VOID RATIO e ₀	COMPRESSION INDEX C _p	SWELLING PRESSURE (kg/cm ²)	
TYPE OF SAMPLES																												
UDS	16.0		Dark grey silty clay with kankar of medium plasticity (CI)	35																								
SPT	17.0			38																								
SPT	18.0			40/25																								
UDS	19.0			45/26																								
SPT	20.0			48/26																								
SPT	21.0		Dark brown poorly graded fine silty sand (SP-SM)	55/27																								
UDS	22.0			40/25																								
SPT	23.0			45/26																								
UDS	24.0			48/26																								
SPT	25.0			55/27																								
SPT	26.0		Dark brown poorly graded fine silty sand (SP-SM)	40/25																								
UDS	27.0			45/26																								
SPT	28.0			48/26																								
SPT	29.0			55/27																								
SPT	30.0			40/25																								



FOR FGD TENDER PURPOSE ONLY									
NO.	DESCRIPTION	DATE	BY	CHECKED	APPROVED	SCALE	UNIT	REVISION	REMARKS
1	FOR FGD TENDER PURPOSE ONLY								

EQUIPMENT LAYOUT PLAN AT EL. 0.00M.									
NO.	DESCRIPTION	DATE	BY	CHECKED	APPROVED	SCALE	UNIT	REVISION	REMARKS
1	FOR FGD TENDER PURPOSE ONLY								

NTPC Limited
ENGINEERING DIVISION
NEW MARIAGAR SUPER THERMAL POWER PROJECT
(CUSTOMER)

FOR FGD TENDER PURPOSE ONLY