

S. No.	Reference of Bidding Document			Subject	Bidder's Query	Owner's/ PMC Reply
	Part/ Sec.	Page No.	Clause No.			
1	P-II/ Sec.2.0	290 of 1527	1.3	Steam Parameters at Hook Up Points: HP SH Steam (HRSG Generated) = 91 kg/cm2(g) (NORMAL) Saturated Steam = 95 kg/cm2(g) (NORMAL) Saturated Steam = 116 kg/cm2(g) (MAX.)	Kindly provide saturated steam at 116 Kg/cm2(g). Pressure regulation shall be done by the bidder as per the process requirement.	As per NIT
2	P-II/ Sec.2.0	290 of 1527	1.3	Saturated Steam	Customer/ Consultant to specify Quality of Saturated Steam	As per NIT
3	P-II/ Sec.2.0	290 of 1527	1.3	Saturated Steam	1. Availability- Continuous/ Intermittent. 2. Quantity of Saturated Steam (available at bidder's terminal point) at different HRSG loads (apart from MCR/ Guarantee loads) shall be furnished.	Saturated Steam supply shall be on continuous basis during normal operating conditions of the plant. However Bidder shall provide safety for Superheater coil incase supply of saturated steam is not available from the owner's end due to any interruptions in upstream plant.
4	P-I/Annx-1.2	216 of 1527	PART-V	GCV of Natural Gas- Bidder to provide	We understand that LEAN (Natural Gas) shall be considered as guarantee fuel and the same shall be used for guarantee/ evaluation purpose. Kindly confirm. Further, Customer is requested to indicate the value of GCV of guarantee fuel based on which evaluation will be done, so as to avoid ambiguity and to bring all the bidders on equal footing.	Please refer Amendment of Annexure-1.2 specifying the NCV to be considered for guaranteed NG consumption.
5	P-II/ Sec.2.0	302 of 1527	3.3	Since hot BFW is being supplied in place of DM water at amb. Temp. Bidder to design the system to recover heat from flue gas exhaust to get maximum efficiency and min. NG consumptions, Bidder shall furnish detailed scheme along-with Bid documents. The desired stack temperature should be below 120°C.	1. We understand that only hot BFW is available at bidder's terminal point and installing heat recovery surfaces in stack is not envisaged. Achieving stack temperature of the order of 120°C at stack inlet with a feedwater temperature of 145°C, will not be thermodynamically possible. The minimum possible stack inlet temperature will be Boiler Feed Water Temperature + 10°C (if cold DM is not available for heat recovery in HRSG). Kindly concur. 2. Achieving stack inlet temperature of the order of 120°C is only possible by using cold DM water (at ambient temperature) to recover heat from hot flue gases. Hence, customer is requested to provide cold DM water for heat recovery in HRSG. Kindly Confirm.	Refer Amendment.
	P-II/ Sec.2.0	291 of 1527	1.4	BFW Supply Temperature (Normal)=145°C		Refer Amendment.
6	P-II/Sec.12.0	1313 of 1527	2.5.1,2.6.2	Noise level of 85 dba at 1 meter.	Noise generated shall be 85dBA at 1m distance from the boiler under normal operating conditions. However in the case of safety valves, drain valve where occurrence of safety valve lifting/ drain valve operation is intermittent, higher values of noise level (115dBA) is allowed as per OSHA Standard.	As per NIT
7	P-II/ Sec.2.0	301 of 1527	3.3	HRSG shall be designed for a turndown of min. 30% of Rated capacity at normal GTG load without opening the start up vent.	30% MCR turndown will be possible only at part load of GT. At normal GTG load, minimum steam generation with rated parameters will be greater than 30%MCR.	As per NIT
8	P-II/Sec.12.0	1314 of 1527	2.6.2	Rated net HP superheated steam (Normal at 91 Kg/cm2g, 510 °C) output of 100MTPH along with Superheating of 45 MTPH Saturated Steam (95 Kg/cm2g,306°C to 91 Kg/cm2g, 510 °C) at Hook-up points with steam quality <u>as per VGB Standard</u> during capability test.	Kindly mention the document number (along with the revision number) of VGB standard which mentions about the steam quality guidelines. Further, customer/ consultant is requested to furnish a copy of the afore said VGB standard to avoid ambiguity.	As per NIT
9	P-II/Sec.2.0	293 of 1527	1.6	<b>Fuel Gas Quality:</b> RICH GAS	Sum of the constituents specified in tender document comes to 100.25%. Hence, the following composition (as in Panipat/ Bhatinda) shall be considered: C1 - 84.50%, C2- 9.00%, C3- 3.00%, i-C4/n-C4- 2.00%, i-C5/n-C5- 0.25%, C6- 0%, N2-1.25%. Kindly concur.	Refer Amendment.
10	P-II/Sec.2.0	293 of 1527	1.6	<b>Fuel Gas Quality:</b> LEAN GAS      AVERAGE GAS      RICH GAS	For the fuel analysis provided: <b>a. LEAN GAS:</b> Density Calculated = 0.6916 (kg/Sm3) GCV Calculated = 13210 (kCal/kg) = 9136 (kCal/Sm3) NCV Calculated = 11910 (kCal/kg) = 8237 (kCal/Sm3) <b>b. RICH GAS:</b> Density Calculated = 0.8157 (kg/Sm3) GCV Calculated = 12720 (kCal/kg) = 10376 (kCal/Sm3) NCV Calculated = 11517 (kCal/kg) = 9395 (kCal/Sm3) Customer to check the values of Densities and GCV/ NCV furnished in the tender document and confirm.	Refer Amendment being issued for Gas composition.
11	P-II/Sec.2.0	302 of 1527	3.3	Continuous on-line GTG exhaust and stack monitoring system consisting of sampling probes, piping, analysers, etc. for analysis of NOx, CO and un-burnt Hydrocarbon and SOx, NOx, O2, CO2 and CO respectively shall be provided on the GTG Exhaust and main stack of HRSG.	The combustion takes place in the presence of sufficient excess air in both GT & HRSG. So, the possibility for the presence of HCs in the flue gas is eliminated. Hence, HC analysers are not required. Kindly concur.	As per NIT

12	P-II/Sec.4.3	349 of 1527	3.1.2	The design of the HRSG module shall be based on field erected unit with as much equipment already pre-assembled as practical. The size and weight of modules shall be based on site transportation requirements and limits.	HRSGs are always supplied as follows 1. Drum is supplied as an assembly with Nozzles, fittings and internals 2. Super heater, Evaporator, Economiser and Water preheater coils (as per applicability) supplied as modules 3. Ducts are supplied as sub assemblies as loose items 4. Structural columns, beams and channels supplied as loose items 5. Insulation and cladding sheet supplied as loose items 6. Duct burner is supplied as sub assembly To the extent possible, considering the ODC constraints BHEL standardised shipment sizes to reduce the site work and to facilitate the easy & speedy erection activities to complete the project as per schedule. BHEL erection group will erect the equipments at site as per the established erection practices. a. Modularisation of burner with duct is not possible due to ODC constraints b. Modularisation of duct assembly with Insulation and cladding sheet is not feasible due to anticipated mechanical damage by handling, transportation and rains c. Modularisation of drum with riser tubes and sat links is also not feasible due to ODC constraints d. Modularisation by applying insulation over the four sides of the duct at shop works, covered with cladding sheet and then inserting modules (Super heater, Evaporator, Economiser) into the box made of HRSG ducts is not feasible. This modularisation concept has already been studied by BHEL in consultation with Power Sector regions and Technical Services group and following conclusions have been arrived at after facing extensive hotspot problems in various sites. 1. Insulation and cladding sheet gets peeled off during transportation 2. Insulation get mechanically damaged due to handling and transportation 3. Insulation and cladding sheet become wet due to transportation and rains during storage at site 4. Extensive hot spots are formed during operation of HRSG due to insulation damage and forced to shut down occurred and for several months spent to repair the hotspots. Beacuse of the hotspot problems extensively faced by BHEL in boxed manufacturing of HRSG, Boxed design and manufacturing will not be done.	As per NIT
13	P-II/Sec.4.3	349 of 1527	3.1.3	HRSG shall also be designed for GTG full load when no steam is generated (dry run condition)	When GT is in operation and no steam is generated in HRSG, the GT exhaust will be diverted into the by pass stack and the HRSG will be isolated by operating the guilotine gate/ diverter damper. Hence, HRSG will not be designed for dry running.	Noted. However, sufficient water volume/scheme to provided in boiler drum after Low Low level trip to avoid any dry run of HRSG to protect HRSG and accessories including Import Steam Superheater Coil and submit backup calculation for this.
14	P-II/Sec.5.3	404 of 1527	1.3.1	The calculation of wall thickness required for pipelines subject to internal and/or external pressure shall be based..... In any case a minimum corrosion allowance of 1.5 mm shall be considered while selecting the thickness.	Quality of Feed Water, Boiler Water and steam is monitored once in a shift to keep a check on the critical paramters such as pH, TDS, Dissolved Oxygen, Silica. This ensures maximum life of the boiler pressure parts/ piping. Since such stringent measures are taken during operation additional requirement (over and above that mentioned in IBR min. thickness formula) need not be considered. Hence, Corrosion allowance shall be as per IBR.	AS per NIT
	P-II/Sec.2.0	297 of 1527	2.2	HRSG Design Code - IBR		As per NIT
15	P-II/Sec.4.3	352 of 1527	3.2	Steam Drum shall be designed and fabricated in accordance with IBR latest edition and ASME Sec.VIII Div.1 latest edition.	ASME Sec.VIII is not applicable for Boilers/ HRSG. Steam Drum shall be designed as per IBR & ASME Sec.I requirements.	As per NIT
16	P-II/Sec.4.3	358 of 1527	3.13.1	Adequate number of sampling points for saturated steam, superheated steam, drum water, feed water, etc. shall be provided by the Bidder. The sampling points shall be complete with nozzles, valves and connections. The sample piping shall be of stainless steel SS 304. All sample coolers shall be grouped and provided at ground level.	SWAS Analysers will be provided to continuously monitor the desired parameters at desired locations. SWAS system itself consists of manual sampling points and hence manual sampling points are an integral part of the SWAS system. Kindly concur.	As per NIT
17	P-II/Sec.5.6	978 of 1527	5.1.5	Bolted connections shall be adopted as far as practicable, except for cases where welded connections are required viz. (Galvanized.....)	Structures shall be of welded type. Kindly concur.	As per NIT
18	P-II/Sec.2.0	302 of 1527	3.3	Steam drums shall be designed for water storage time of minimum 3 minutes between normal water level and drum low level trip corresponding to MCR capacity	Steam drum shall be designed for a water storage time of 2 minutes between NWL and low level trip , corresponding to MCR steam generation. Kindly concur.	As per NIT

19	P-II/ Sec.2.0	291 of 1527	1.4	Boiler Feed Water Quality	As per our standard practice Boiler Feed Water Quality shall be as follows: - Total Hardness, ppb= Nil - pH at 25 °C (for Copper Alloy pre-boiler system) =8.8 – 9.3 - pH at 25 °C (for Copper-free pre-boiler system) =9.0 – 9.6 - Specific Electrical conductivity at 25 °C measured after Cation exchanger in the H+ form after CO2 removal (microsiemens / cm), (Max.) < 0.2 - Dissolved Oxygen, ppb, (Max.) <10 - Silica as SiO2, ppb, (Max.) <20 - Iron as Fe, ppb, (Max.) <20 - Copper as Cu, ppb, (Max.) < 3 - Residual Hydrazine, ppb = 10-20 - Total Organic Carbon , ppb, (Max.) <200 Kindly Confirm.	As per NIT
20	P-I/Annx-1.2	216 of 1527	PART-V	Guaranteed Fuel Consumption	The normal operating condition at which input and output streams would cross the bidder's battery limit, based on which the guaranteed fuel consumption shall be calculated are as follows: 1. Natural gas (LEAN) shall be made available at 40/57 kg/cm2(g) and 30°C. 2. GCV of Natural gas (LEAN) shall be 9136 (kCal/Sm3). 3. Net Steam at battery limit shall be 65 TPH (HRSG Generated)+30 TPH (Superheated Customer Supplied Saturated Steam) at 91 (kg/cm2(g)) & 510°C. 4. Hot BFW shall be available at 140 kg/cm2(g) and 145°C. 5. DM Water (for dosing) shall be available at 7 kg/cm2(g) and 45°C. 6. Minimum flue gas temperature at stack inlet shall be Feed Water Temperature + 10°C. 7. Flue Gas Enthalpies shall be as per ASME PTC4.4. 8. Water/ Steam Enthalpy shall be as per IAWSP-IF97. Customer to confirm.	As per NIT
21	P-II/Sec.4.3	351 of 1527	3.1.12	HRSG Technical Specification The height of the HRSG flue gas main stack above finished grade level shall be as per design specification and shall be self-supporting type. Design of the stacks shall meet the requirements of various codes & rules/regulations	Since, there is no specific stack height mentioned in the tender, we consider the minimum stack height as 30 mtr. Customer may pl confirm.	As per NIT
22	P-II/Sec.5.1	375 of 1527	5.3a (i)	UT Examination: All butt-welds in thickness greater than 50mm as supplement to radiography	1) For Boiler Drum: Accepted. 2) For Headers & Piping: As a practice, any one NDE i.e., UT or RT will be carried out.	Noted.
23	P-II/Sec.5.1	375 of 1527	5.3a(ii)	UT Examination:FPW of nozzle attachments of thk. above 50mm as supplement to radiography	UT alone may be performed.	Noted.
24	P-II/Sec.5.1	375 of 1527	5.3b(i)	All edges of plates and opening in shell of CS	Since all the edges are prepared by machining, no MT/PT is required. MT/PT will be performed only for the gas cut edges/openings.	Noted.
25	P-II/Sec.5.1	375 of 1527	5.3b(ii)	Root and final layer of all butt welds	Since all butt welds are covered by RT/UT, this stage is not envisaged.	As per NIT
26	P-II/Sec.5.1	376 of 1527	5.3d	Test on welds of Cr-Mo, Materials after final heat treatment. The value shall comply with the IBR / relevant codes.	Hardness test will be carried out only for Gr.91 welds. This is the practice being followed for all customers.	As per NIT
27	P-II/Sec.2.0	301 of 1527	3.3	HRSG shall be designed to run normally at 65 TPH with provision to ramp up to rated capacity of 100 TPH in 2 minutes, effortlessly with no side effect like overheating, auxiliary boilers over loading, etc. and capable of running continuously at 100 TPH.	As a standard practise to ensure safety of HRSG, a ramp up rate of 3% MCR per minute is suggested by BHEL. However, to increase the steam generation from 65 TPH to 100 TPH supplementary firing shall be gradually increased by monitoring after firing temperature(<850°C) , Metal temperature of Superheater and drum water level.	As per NIT
28	P-II/5.5	846 of 1527 856 of 1527	7.1 & 8.0	Flue Gas Analyzers	As per Cl.no.7.1 , sht 12 of 125, On-line gas analysers shall be CO, O2, SOx, NOx and UHC (Un-burnt Hydrocarbon), etc. But,As per cl.8.0. sht 23 of 125, Flue gas monitoring system shall be SOx, NOx, CO, O2, and CO2. Kindly clarify.	As per NIT
29				Control room distance	Kindly mention the distance from HRSG field to control room.	One view only station for monitoring of both GTG & HRSG shall be required in Ammonia Control room.Second view only stayion to monitor both GTG & HRSG shall also be required in SGP control room. The tentative distance of both control rooms shallbe approx. 700 Mtrs.
30	P-II/Sec. 5.4	448 of 1527	6.12.3	All 415V motors shall be minimum IE3 as per latest edition of IS: 12615.	IE2 type motors are normally considered.May pl be reviewed.	All 415V motors shall be minimum IE3
31	P-II/ Sec 2.0	451 of 1527	7.1.2	The minimum size of power cables shall be 16 sq. mm (Cu).	The minimum size of power cables shall be 2.5 sq. mm (Cu) .	The minimum size of power cables shall be 2.5 sq. mm (Cu) is acceptable. However, as per NIT Clause No. 10.1 of Section-5.4, cables upto and including size of 16 sq.mm shall be of copper conductor and cables above 16 sq.mm shall be of aluminium conductor.
32	P-II/Sec. 5.8	1011 of 1527	4.3	<b>MOV:</b> Refer STD-0120 STANDARD SPECIFICATION MOTORISED ACTUATOR which calls for motors to be conforming to Ex"d", Gas group IIC, T3.	Whether all MOV motors,even in safe area also shall be Ex"d"type?PI confirm	As per NIT

SL No.				Bid Specification Stipulation	Statement of clarification sought	Owner's Response
	Title	Page	Clause			
1	(SITE WORKING AND SAFETY CONDITIONS) ELECTRICITY & CONSTRUCTION POWER	SHEET 4&5 OF 16	2.12 2.13	<p>ELECTRICITY Construction power shall be provided by NFL at one point.</p> <p>CONSTRUCTION WATER The Construction Contractor shall communicate his water requirements to the Owner within 7 days of the placement of LOI. Construction water, at single point, shall be provided by NFL. Any further distribution will be the responsibility of the Construction Contractor.</p>	<p>Please provide us the voltage level at which construction power will be provided at single point.</p> <p>As per the bid specifications we understood following: 1. Construction power will be provided at one point in each unit free of cost by the owner. Further distribution will be done by contractor. 2. Construction water will be provided by owner at a single point free of charge. All arrangements for further distribution beyond this point have to be made by the Contractor. Kindly confirm.</p>	At 415V, 50 Hz
2	(SITE WORKING AND SAFETY CONDITIONS) EMPLOYMENT OF LABOUR	SHEET 5 OF 16	5.5	It shall be the responsibility of Construction contractor to provide suitable accommodation including necessary facilities for their labour and staff.	Kindly clarify whether electricity and water for bidder office and labour colony shall also be provided at single point. If yes then whether it is free of cost or on chargeable basis.	ITB Condition Prevail
3	(SITE WORKING AND SAFETY CONDITIONS) EMPLOYMENT OF LABOUR	SHEET 5 OF 16	5.5	It shall be the responsibility of Construction contractor to provide suitable accommodation including necessary facilities for their labour and staff.	As per the bid specifications we understand that the owner shall provide land, free from all encumbrances, free of charge for construction of site office, open yard, closed storage sheds, labour colony and other site infrastructure. Approx. area required will be: • Open storage & fabrication Yard – 30000 Sqm • Closed Storage sheds – 8,000 Sqm • Site office & other facilities –4000 Sqm <b>Owner to confirm the availability of same.</b>	Space for Labor colony shall not be given in factory however township accommodation on payment basis shall be made available as per availability, requirement of other indicated area is also more
	(SPECIAL CONDITIONS OF CONTRACT) LABOUR AND STAFF	Page 38 of 57	7.3	The CONTRACTOR shall at his own cost provide office and other accommodation for his staff and workmen. The CONTRACTOR shall also provide communication, transport and medical facilities to his staff and workmen.		
	(SITE WORKING AND SAFETY CONDITIONS) SITE ESTABLISHMENT	SHEET 3 OF 16	2.1	The Construction contractor shall provide all huts, stores, tarpaulins and other covers for the accommodation of his staff, workmen and materials. All materials likely to deteriorate in the open shall be stored under suitable cover.		

SL No.				Bid Specification Stipulation	Statement of clarification sought	Owner's Response
	Title	Page	Clause			
4	(CONSTRUCTION, ERECTION, PRECOMMISSIONING, COMMISSIONING AND START UP)	Page 65 of 98	9.0	List of construction & testing equipment	As per the bid specifications we understand that the list of construction & testing equipment provided is only suggestive/indicative list and the same will be finalized only after award of project and as per actual requirement to meet the project implementation schedule. Kindly Confirm.	Noted

REFERENCE OF BIDDING DOCUMENT					Bidder's Query	OWNER'S/PMC REPLY
Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
<b>Mechanical</b>						
1	PNMM/PC140/E-601/P-II/Sec. 2.0	6 of 21	1.4	Feed water supply temperature	Feed water supply normal temperature is mentioned 145 Deg C. We understand that same is to be considered at guarantee condition. Please confirm.	Normal Pressure & temp. of BFW to be considered.
2	PNMM/PC140/E-601/P-II/Sec. 2.0	7 of 21	1.6	Fuel Gas Quality	Please indicate the guarantee gas composition and its supply parameters.	As per NIT
3	PNMM/PC140/E-601/P-II/Sec. 12.0	8 of 10	2.6.2, v	Fuel Consumption (in SM3/hr along with GCV)	As per normal practice GT heat input is guaranteed w.r.t NCV basis only. However, in this tender it is asked on GCV basis. Customer is requested to take data of heat input on NCV basis also from all the bidders to avoid any error in guarantee heat input. Heat input on GCV basis = GCV/ NCV x Heat input on NCV basis. As GCV basis for GT is not a standard practice, hence there is a chance of mistake made by bidder. Hence, Customer is requested to check and ensure.	Please refer Amendment of Annexure -1.2 specifying the NCV to be considered for guaranteed NG consumption.
4	General	NA	NA	LP Steam for Gas Heater, if required	Please confirm the availability of LP steam from customer end for Gas heater, if required.	Can be supplied.
5	Plot plan NFL Nangal	Dwg No. PC140-0000-0001	NA	Pipe racks	New pipe racks are indicated outside the GT-HRSG plant boundary. Please clarify this pipe rack is in bidder scope or Customer's scope..	Bidder scope

Sl. No.	Document No.	Clause No.	Page No.	Description	Query	Owner's / PMC Reply
1	NIT for GT & HRSG project PNMM/PC135..136 /E-601/P-I/Sec.-2.0	1.0	4 of 89	The scope of work includes (but shall not be limited to) supply of basic design, detailed engineering, procurement, supply, fabrication, inspection by third party inspection agency (TPI) as applicable	Third party inspection is not applicable for control systems under this proposal, pls confirm.	Applicable, As per NIT
2	PNPM/PC-135..136//E-601/P-II/5.5	25.1  25.3	58 of 126  59 of 126	Over-speed trip (OST) system shall be TMR based & SIL-3 compliant. 3 nos. speed probes used for OST shall be separate from the 2 nos. probes used for governor speed control.  Gas Turbine Generator (GTG) Control Philosophy General: •The offered control system shall be supplied having a classified SIL 3 levels for Plant and Personnel Safety.		Deviations if any may be clearly highlighted.
3	VENDOR LIST PNMM/PC135..136 /E-601/P-II/Sec.-10.0	4.41	34 of 38	Distributed Control System	BHEL make Valmet DNA (former name was Metso DNA) based controls are proposed for control, monitoring & protection for GTG-HRSG Package . This system is manufactured by BHEL at Electronics Division, Bangalore under collaboration with Valmet Automation, Finland. The offered DCS system (Valmet DNA) is well proven in various power plant ratings of upto 800MW for different control applications such as boiler controls, turbine controls, Station C&I, electrical controls/SCADA, Hydro plant controls and so on. Reference installation details & other credentials can be furnished for the same alongwith technical offer. Please confirm the acceptance.	NIT vendor list to be followed.
4	PNPM/PC-135..136//E-601/P-II/5.5	25	56 of 126	No interfacing is required through Modbus/Serial link between new DCS & existing DCS of Ammonia & SGP. Only one dedicated view only station is required at each existing DCS room.	We undersatand that One no. dedicated operator station is required at existing DCS room at Nangal. Please confirm.	One view only station for monitoring of both GTG & HRSG shall be required in Ammonia Control room.Second view only stayion to monitor both GTG & HRSG shall also be required in SGP control room. Total four view only station for Panipat & Bathinda ( each) shall be required as per NIT for each location.

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Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
<b>Mechanical</b>						
1	PNMM/PC140/E-601/P-II/Sec. 2.0	6 of 21	1.4	Feed water supply temperature	Feed water supply normal temperature is mentioned 145 Deg C. We understand that same is to be considered at guarantee condition. Please confirm.	Normal Pressure & temp. of BFW to be considered.
2	PNMM/PC140/E-601/P-II/Sec. 2.0	7 of 21	1.6	Fuel Gas Quality	Please indicate the guarantee gas composition and its supply parameters.	As per NIT
3	PNMM/PC140/E-601/P-II/Sec. 12.0	8 of 10	2.6.2, v	Fuel Consumption (in SM3/hr along with GCV)	As per normal practice GT heat input is guaranteed w.r.t NCV basis only. However, in this tender it is asked on GCV basis. Customer is requested to take data of heat input on NCV basis also from all the bidders to avoid any error in guarantee heat input. Heat input on GCV basis = GCV/ NCV x Heat input on NCV basis. As GCV basis for GT is not a standard practice, hence there is a chance of mistake made by bidder. Hence, Customer is requested to check and ensure.	Please refer Amendment of Sec-1.2 specifying the NCV to be considered for guaranteed NG consumption.
4	General	NA	NA	LP Steam for Gas Heater, if required	Please confirm the availability of LP steam from customer end for Gas heater, if required.	Can be supplied.
5	Plot plan NFL Nangal	Dwg No. PC140-0000-0001	NA	Pipe racks	New pipe racks are indicated outside the GT-HRSG plant boundary. Please clarify this pipe rack is in bidder scope or Customer's scope..	As per NIT



REFERENCE OF BIDDING DOCUMENT					Bidder's Query	OWNER'S/PMC REPLY
Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
<b>Electrical</b>						
1	PNMM/PC140/E-601/P-II/Sec. 5.4	5 of 39	1.1 n	11kV/3.3kV Extension Panels (if required)	Customer /consultant may please clarify that new 11/3.3kV switchboards are to be considered for this package or the existing switchboards needs to be utilised with modification(if required).	New 11KV/3.3 KV switch boards are to be considered as mentioned in SLD & NIT with modification as defined in NIT.Extension Panel in Existing 11kv switch board if required shall be in bidder's scope.Bidder to visit site for more clarification.
2	PNMM/PC140/E-601/P-II/Sec. 5.4	6 of 39	1.3	11kV Switchboard	Bidders understanding is that one no. of 11kv switchboard with one incomer and two tie lines along with feeders for GT -HRSG requirement to be considered. Customer /consultant may review and confirm the requirement.	Please refer SLD attached with NIT and Cl. No. 1.0 of Design Philosophy-Electrical
3	PNMM/PC140/E-601/P-II/Sec. 5.4	7 of 39	1.4	Hookup with Existing systems	Customer/consultant may please provide us the key SLD of the plant along with the details of hookup requirements with the existing systems.	Please refer SLD attached with NIT and Cl. No. 1.0 of Design Philosophy-Electrical.SLD is attached with NIT on page no. 779 of 1527.
4	PNMM/PC140/E-601/P-II/Sec. 5.4	7 of 39	1.11	Electrical system studies	Customer/consultant may please note that the system studies as per the referred clause shall be included for new system supplied by bidder. However, Implications/modifications required in existing system due to system study may be done by customer. Customer/consultant may review and confirm.	System Study of Electrical System shall be done by bidder as per NIT  Bidder to access implication / modification required in existing system at this stage only and include cost of the same, if applicable, in their lumpsum price. .
5	PNMM/PC140/E-601/P-II/Sec. 5.4	13 of 39	4.3.4	Emergency power from the existing DGDB	Customer/consultant may please provide us the location of existing DGDB and also inform us the available feeder details like rating, type etc. for GT-HRSG Package.	To be discussed during site visit by Bidder
6	PNMM/PC140/E-601/P-II/Sec. 5.4	14 of 39	5.11	a) A clear space of 1.5 Mtrs is required back of panels having highest depth i.e. incomers; others panel in same switch board shall have a rear clearance of 2.5 Mtrs (minimum). b) A clear space of 5M between the two Boards facing each other. d) A clear space of 1.5M between two boards in same line.	As per standard practice, following are the clear spaces required to be maintained. a) A clear space of 1.0 M behind the panels with highest depth. b) A clear space of 2.5 M between the two Boards facing each other. d) A clear space of 1.0 M between two boards in same line. Customer /consultant may review and accept bidder proposal.	Clear Space shall be as per NIT.

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Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
7	PNMM/PC140/E-601/P-II/Sec. 5.4	16 of 39	5.25	Two Panel extension space on each side (for each Bus section) or three panel extension space on one side (in exceptional cases) shall be provided for all HV switch board , PMCCs& ACDB/ASBs	Customer /consultant may please clarify whether extension space as mentioned in the ref.clause is including the clear space required between two boards in the same line as per clause. 7.8.d. or not.	The space required for extension shall be excluding of space required between two switchboards.
8	PNMM/PC140/E-601/P-II/Sec. 5.4	28 of 39	6.8.5	Generator isolation transformer with Off load tap changer.	As per the ref. clause , Generator with Off load tap changer is the requirement where as as per clause no .6.8.4 , the requirement is On load tap changer. Customer /consultant may review and clarify the requirement.	On load Tap changer is required for Generator isolation transformer.
9	PNMM/PC140/E-601/P-II/Sec. 5.4	32 of 39	7.2.1	Cable trenches	As per the ref. clause , Cable trenches are to be considered as per the requirement. where as as per clause no .7.2.2 , cables shall be laid on overhead trays. Customer /consultant may review and clarify the requirement.	All new power and control cables shall be laid properly in existing route if available.New cable trays/trenches and supporting structure for the cable trays shall be provided by the bidder. 66KV cables shall be laid in new cable trays for this new support structure shall be provided
10	PNMM/PC140/E-601/P-II/Sec. 5.4	3 of 6	3.1	Aluminium Cable trays	As per the ref. clause ,Aluminium Cable trays is the requirement . Customer /consultant is requested to accept GI Trays.	The cable trays shall be of aluminium, as per NIT.

REFERENCE OF BIDDING DOCUMENT					Bidder's Query	OWNER'S/PMC REPLY
Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
<b>C&amp;I</b>						
1	PNMM/PC135...136/E-601/P-II/Sec.-5.4	3 of 7 (674 of 1527 of overall spec)	4.1	Type of JB's for Weather proof & Ex proof area	Ther is a contradictory statement as per referred in clauses i.e. whether JB should be weather proof or explosion proof. It is requested to kindly clarify. As per satutory requirement, weather proof JB shall be for all Intrinsic safe/ weather proof instruments and Explosion proof JB for Exproof. Kindly confirm the above philosophy.	Hazardous Area Classification shall be zone 1, II A / IIB, T-3,
	PNPM/PC-140//E-601/P-II/5.5	11 of 125 (845 of 1527 of overall spec)	5.2			for Instrumentation JB shall be as per clause 5.2 , Section 5.5 only.
2	PNPM/PC-140//E-601/P-II/5.5	13 of 125 (847 of 1527 of overall spec)	7.1	Infrared configurators for liquid analysers.	We understand that infrared configurator is required for SWAS analysers . However, as per our market survey, such infrared configuration facility is available with one vendor i.e. M/s Emerson for only pH and conductivity analysers. Whereas the Co-gen plant required other analysers like Silica, Sodium etc which are not available with infrared configuration facility. Hence Customer/Consultant is requested to elaborate the requirement and provide additional vendors for the same.	Infrared configurators are optional. Analyzer must be atleast HART compatible.
3	PNPM/PC-140//E-601/P-II/5.5	45 of 125 (879 of 1527 of overall spec)	22.5	Temperature Transmitters (TT) for Bearing and winding RTD	As per referred clause, Temperature transmitters shall be provided for all temperature elements in closed loops and loops connected to PLC/Interlocks. It may be noted that Bearing and winding RTDs for each motor/pumps are approx 6/8 nos for pump tripping. Please clarify whether TT has to be provided for such large quantity RTDs for bearing and winding temperature measurement.. It is proposed to connect these RTDs to DCS & contact shall be wired to PLC. Please review above proposal.	TT are required as per NIT.
4	PNPM/PC-140//E-601/P-II/5.5	55 of 125 (889 of 1527 of overall spec)	25	No interfacing is required through Modbus/Serial link between new DCS & existing DCS of Ammonia & SGP. Only one dedicated view only station is required at each existing DCS room.	Conflict in the requirement as per referred clause. Kindly clarify whether is there any interfacing with existing DCS or only one dedicated station is required in existing control room?.	No software communication is required between existing DCS systems ( Ammonia & SGP) with new systems for GTG & HRSG. One view only station for monitoring of both GTG & HRSG shall be required in Ammonia Control room.Second view only stayion to monitor both GTG & HRSG shall also be required in SGP control room
	PNPM/PC-140//E-601/P-II/5.5	55 of 125 (889 of 1527 of overall spec)	25	Hardware required for the communication with the existing DCS in the service Boiler control room and Ammonia control Room shall be in the scope of the Bidder.		Hardware required for view only stations is being mentioned.

REFERENCE OF BIDDING DOCUMENT					Bidder's Query	OWNER'S/PMC REPLY
Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
5	PNPM/PC-140//E-601/P-II/5.5	88 & 89 of 125 (922 & 923 of 1527 of overall spec)	27.1.2 & 27.1.13 (e)	i) FRLS cable? ii) Only 12 pair multipair cable shall be used.	i) Bidder shall provide PVC inner sheath and FRLS (Fire resistant low smoke) PVC outersheath cable. ii) Bidder propose to use 6 pair and 12 pair multipair cable. As it may be possible that 9 or 10 signal may not be grouped everywhere in plant. So it will be very cost effective and resources optimized solution to have 6 pair and 12 pair cable. However wherever possible, Bidder shall use 12 pair cable.	(i) Noted (ii) NIT to be followed.
6	PNPM/PC-140//E-601/P-II/5.5	71 of 125 (905 of 1527 of overall spec)	25.4	All outdoor field instruments shall be provided with SS sheet Canopy.	Conflict in the referred clause. Kindly clarify, whether canopies required for outdoor field instruments or all field instruments.	All outdoor field Instrumentation including push buttons. Sensors etc. shall be with SS sheet canopy.
	PNPM/PC-140//E-601/P-II/5.5	94 of 125 (928 of 1527 of overall spec)	27.6	SS sheet canopies shall be used along with all field instruments		
7	General	-	-	Transmitter Housing	Kindly confirm the transmitter enclosure material whether it is Die cast aluminium or SS?	Die cast Aluminium is acceptable.

REFERENCE OF BIDDING DOCUMENT					Bidder's Query	OWNER'S/PMC REPLY
Sl. No.	Part No./ Volume	Page no.	Clause No.	Subject		
<b>CIVIL</b>						
1	General	-	-	Demolishing the existing Structures if any.	Please furnish detailed drawings such as plan, sectional details, foundation details, architectural detail drawings etc of the the structures to be dismantled.	Details to be collected during site visit
2	General	-	-	Site grading& levelling	Site is assumed to be levelled and no grading is required. Micrograding of $\pm 300$ mm is only in bidder's scope.Please Confirm . Or else Kindly furnish the topography survey showing contour level & FGL of proposed area.	As per NIT & in Bidder's scope

Sl. No.	Reference of Bidding Document				Bidder's query	Owner's / PMC reply
	Part/Sec	Page No.	Clause No.	Subject		
1	Master Index	1 of 3	NA	1 X 20 MW GTG (GAS TURBO GENERATOR) ,WITH BLACK START OPERATION	We understand for three site the capacity requirement of 20 MW at site rated condition is NET basis which means gas turbine shall be capable of generating 20MW+ Plant Aux consumption. Please confirm.	As per NIT
2	ITB	19/1527	8.1.1.1 III	GTG unit must be in satisfactory operation at least from 01.03.2016 to date of issue of ITB	We understand that the proposed Gas turbine must have 8600 continuous fired hours or more in a single installation in a commercial fertilizer plant COGEN application to be qualified to quote for the current offer. Please confirm.	As per NIT
3	ITB	19/1527	8.1.1.1 III	GTG unit must be in satisfactory operation at least from 01.03.2016 to date of issue of ITB	Please confirm that experience gathered on field validation engine shall not be considered for Gas Turbine-generator PTR	Noted.
4	ITB	19/1527	8.1.1.1 III	The bidder shall also submit documentary evidence to the effect that the proposed GTG manufacturer for the subject tender must have supplied at least 1 no. GTG of minimum capacity 25 MW (ISO, Industrial Heavy Duty)	As per our understanding of degradation due to temperature, elevation etc, gas turbine of ISO capacity 30 MW or higher will be required to meet the 20 MW capacity required at site rated condition (46C, 81% RH, more than 220 m elevation). Please clarify the basis for 25 MW ISO capacity. We understand Water/steam injection for power augmentation is not allowed as Dry Low Nox (DLN) system is required.	As per NIT
5	Schedule of Prices	216/1527	PNMM/PC140/E-601/P-I/Annx-1.2	GCV of Natural gas - Bidder to provide	There can be variation in calculation method for GCV that will lead to variation in final GCV value and works cost. GE requested owner to provide the composition of guarantee gas and corresponding GCV.	Work cost shall be based on NCV .Refer amendment to Schedule of Prices Annexure-1.2
6	Technical, Section 2.0	289/1527	1.1	..Industrial Heavy duty..	Please clarify the features necessary to be qualified as "Industrial heavy Duty" gas turbine.	As per NIT.
7	Technical, Section 2.0	289/1527	1.1	..Industrial Heavy duty..	Aeroderivative gas turbines are industrial turbines. Is their lack of experience in Indian Fertilizer Plant Cogen application can be a reason for their ineligibility?	As per NIT.
8	Section 4.1 TECHNICAL SPECIFICATIONS GAS TURBINE	Page 3 of 17	3.0 xvii	Gas Turbine manufacturer's standard Control and Monitoring System.	Different OEM has different level of redundancy for unit control panel - Triple Modular redundancy is industry wide accepted as the best option. However, if there is a control system offer with dual modular redundancy, we understand there will be a penalty to ensure equality of treatment to all OEM. The penalty will be as per established industry practice.	As per NIT.

SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
1	PNMM/PC135..136/E-601/P-I/Sec.-2.0	Page 4 of 89	GENERAL CONDITIONS OF CONTRACT	SCOPE OF CONTRACT -1x 20 MW (Minimum) GTG (Gas Turbo Generator) ,with Black Start operation at site condition of 46 degree C & 81 % R.H. at Battery Limit of GT & HRSG (excluding internal consumption of GTG HRSG package).	We understand that the required 20 MW is at alternator terminal at given site condition. Please confirm.	As per NIT
2		Page 82 of 89		STATUTORY APPROVALS -the CONTRACTOR's sole responsibility to obtain all approvals from any authority (except for environment clearance) required under any statute, rule or regulation of the Central or State Government concerned with the performance of the CONTRACT and/or the contractual Work.	Statutory approvals should be in clients scope for complete power plant. Green power will provide necessary documents for the approvals.	As per NIT
3	PNMM/PC135..136/E-601/P-II/Sec.-2A	Page 20 of 21	DESIGN BASIS	All required Utilities & NG shall be supplied at the battery limit of GTG/HRSG by client.	Location we have considered as per tie point showing in the plot plan layout. Kindly confirm.	Bidder has to collect all the required information during the site visit
4		Page 3 of 21	DESIGN BASIS	The Generated Power shall be integrated to existing system for feeding power to fertilizer complex	We presume that the Electrical battery limit for the GTG & HRSG package will be 11kV Switchgear and Emergency incomer of 415V PMCC. We do not envisage any modification in the existing system and Electrical distribution System in our scope. Please confirm.	11 KV Power upto 11 KV terminal box of 11/132 kV existing Transformers, Tapping of Emergency Power from existing Emergency Power Distribution Board as well as retrofitting in same, as required and Hook-up with the Existing System, as per NIT, shall be in bidder's scope.
5		Page 16 of 21	DESIGN BASIS	Continuous on-line stack monitoring system consisting of sampling probes, piping, analysers, etc. for analysis of SO <sub>x</sub> , NO <sub>x</sub> , O <sub>2</sub> and CO shall be provided on the main stack of HRSG.	We understand that Stack monitoring system is not required for By-pass stack. Please confirm.	As per NIT

SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
6		Page 7 of 21	DESIGN BASIS	FUEL GAS QUALITY	Natural Gas fuel NCV shall be considered for HRSG design & performance guarantee as 8679Kcal/kg (lean). Please confirm.	Plse refer Amendment of Annexure-1.2 specifying the NCV to be considered for guaranteed NG consumption.
7		Page 15 of 21	DESIGN BASIS	HRSG steam outlet quality shall be in compliance with VGB standard HRSG shall be designed to run normally at 45 TPH with provision to ramp up to rated capacity of 70 TPH in 2 minute, effortlessly with no side effect like overheating, auxiliary boilers over loading, etc. and capable of running continuously at 70 TPH.	It is mentioned that "HRSG to ramp from 45 TPH to 70TPH in 2 minutes". Please inform what is the significance of 45TPH. At what condition 45 TPH to be met? GT ON (load?)/GT OFF? please let us know saturated steam heating required in this case? Accordingly HRSG will be designed.	As per NIT
		Page 15 of 22	DESIGN BASIS	HRSG shall be designed to run normally at 65 TPH with provision to ramp up to rated capacity of 100 TPH in 2 minutes, effortlessly with no side effect like overheating, auxiliary boilers over loading, etc. and capable of running continuously at 100 TPH.	It is mentioned that "HRSG to ramp from 65 TPH to 100 TPH in 2 minutes". Please inform what is the significance of 65TPH. At what condition 65 TPH to be met? GT ON (load?)/GT OFF? please let us know saturated steam heating required in this case? Accordingly HRSG will be designed.	As per NIT
8		Page 15 of 21	DESIGN BASIS	Bidder shall also indicate the percentage load of GTG (MW) at which HRSG shall produce the design quality & quantity of steam without supplementary firing.	It is mentioned that "Bidder shall indicate % of load of GTG at which HRSG shall produce the designed quality & quantity of steam without supplementary firing" What is the requirement of steam prameters (Flow, pressure & temperature) in this case? Also please let us know saturated steam heating required in this case?	As per NIT
9		Page 8 of 21	DESIGN BASIS	Fuel gas quality	We request PDIL to clarify the supplementary fuel case to be guaranteed for PG test	As per NIT



SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
10	PNMM/PC135..136/E-601/P-II/Sec.-2A	Page 7 of 22	DESIGN BASIS	Boiler blow down shall be sent to cooling water header Boiler blow down shall be routed to be connected to CW return header through pump connected with collection Pit. Blow down tank and connection of blow down water to CW header shall be in scope of Bidder. Boiler blow down shall be sent to cooling water header	Kindly inform us the required blow down water temperature at terminal point	Boiler blow down water shall be sent to Cooling water return header after cooling to less than 50 deg.C through pump
11		Page 15 of 21	DESIGN BASIS	Provision of dosing ALL VOLATILE TREATMENT in boiler drum shall be made to maintain boiler water quality, which is required to ensure the guaranteed steam quality.	All volatile treatment in drum will cause FAC in evaporators & raisers. Hence it is not recommended. Instead better to follow OEM standard.	As per NIT
12		Page 15 of 21	DESIGN BASIS	Stack Temperature	Achieving stack temperature of below 120°C without using Make up water heater will not be thermodynamically possible as the minimum BFP water temperature at inlet of Economiser for Panipat is 205°C , for Bathinda 190°C & for Nangal 145°C . Kindly clarify	As per NIT
13		Page 19 of 21	DESIGN BASIS	SO2 from gas fired boiler	Kindly clarify this point and inform us the requirement of SOX (ppm) in HRSG stack.	As per NIT
14		Page 19 of 21	DESIGN BASIS	Pollution control	Kindly confirm reference O2% level (dry) emission to be guaranteed.	As per NIT
15		Page 16 of 21	DESIGN BASIS	Oily water system	Not applicable to HRSG. Please confirm the requirement.	As per NIT
16		PNMM/PC135..136/E-601/P-II/Sec.-3.0	Page 3 of 8	BIDDER'S SCOPE OF WORK	Underground obstructions	Kindly request you to indicate the underground obstructions in the proposed GTG & HRSG area for our information and reference.
17	Page 4 of 8		BIDDER'S SCOPE OF WORK	Fire hydrant around GTG & HRSG package	Extension of existing fire hydrant system is envisaged & not full fledged fire hydrant system with pumps are not require. We can take Tapping from existing system. Plese confirm	As per NIT
18	Page 6 of 8		BIDDER'S SCOPE OF WORK	All civil foundation, Building, Pavement, drainage, Rain water harvesting & all other Civil works	Civil scope is not clear, we understand that bidder responsibility will be limited to only required civil work related to bidder's scope of supply. Please confirm.	As per NIT

SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
19		Page 3 of 8	BIDDER'S SCOPE OF WORK	Gas turbine inlet air filtration system consisting of inlet screen, pre-filters, barrier type filters, ducting with necessary expansion joints and SS silencer.	As per OEM Standard Inlet air filtration system supplied for Gas Turbine can be of Carbon steel. Only Silencer shall be of SS, kindly confirm	As per NIT
20		Page 7 of 8	BIDDER'S SCOPE OF WORK	GTG recommended maintenance schedule for 15 years indicating clearly requirement of spares / replacement of parts with services of manufacturer's expert personnel at site with duration to be furnished by bidder with technical offer.	Please clarify whether GTG recommended maintenance schedule for 15 years will be part of bid evaluation.	As per NIT

SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
21	PNMM/PC-135..136/E-601/P-II/Sec.- 4.1	Page 16 of 17	TECHNICAL SPECIFICATIO NS GAS TURBINE	During string test, vendor shall carry out sound level test to satisfy the requirements. Sound level shall be measured at a distance of 1M from enclosure above a height of more han 1m. Sound level test shall be carried out at various points around the enclosure.	String test including integration test along with driven equipment and noise test will be carried out at site.	Noted
22	PNMM/PC135...136/E-601/ P-II/Sec.-4.2	Page 8 of 15	TECHNICAL SPECIFICATIO N GENERATOR	The generator shall be outdoor type installed in fully enclosed shed from all sides. The generator degree of protection shall be IP-55.	Generator will be IP44 watercooled, and will be inside the GTG enclosure. Requesting for your acceptance.	As per NIT
23	PNMM/PC135...136/E-601/P-II/Sec.-4.3	Page 12 of 17	TECHNICAL SPECIFICATIO NS HRSG	Compact steam tracing header and trap stations similar to Armstrong type shall be considered.	Steam Tracing is not applicable for this plant.	As per NIT
24		Page 12 of 17	TECHNICAL SPECIFICATIO NS HRSG	Double entry/exit shall be provided in all HRSG Platform as an alternate escape route in case of emergency.	We shall provide Staircase on one side and monkey cage ladder on other side. Kindly confirm	As per NIT
25		Page 2 of 17	TECHNICAL SPECIFICATIO NS HRSG	HRSG shall be designed to produce the superheated steam at rated capacity with GTG shutdown. Required accessories along with FD fan shall be considered accordingly.	We shall consider 1x100% Fresh Air FD Fan for the same. Fans shall be non-API. Fan design and performance testing procedure shall be as per vendor standard. Kindly confirm	As per NIT and fan shall be API compliance
26		Page 2 of 17	TECHNICAL SPECIFICATIO NS HRSG	The HRSG shall also be designed for GTG full load when no steam is generated. The entire HRSG shall be constructed to form a gas tight envelope to prevent gas leakage.	HRSG will be designed to generate 70 TPH of steam. Customer to further elaborate "The HRSG shall also be designed for GTG full load when no steam is generated" statement.	As per NIT
27		Page 3 of 17	TECHNICAL SPECIFICATIO NS HRSG	The exit gas temperature from HRSG shall be kept to the bare minimum, to achieve the highest possible efficiency at normal load condition	Kindly fix the value of gas temperature at stack inlet to be considered. This ensures that all the bidders are on equal footing.	As per NIT
28		Page 2 of 17	TECHNICAL SPECIFICATIO NS HRSG	HRSG dry run	At GT full load, there will be steam generation in HRSG. Nevertheless HRSG dry running is not recommended , if in any condition steam is not required Gas bypass system is to be considered.	Noted. However, sufficient water volume to provided in boiler drum after Low Low level trip to avoid any dry run of HRSG to protect HRSG and accessories and submit backup calculation for this.
29		Page 8 of 17	TECHNICAL SPECIFICATIO NS HRSG	The top 9m of the stack exterior shall be protected from attack by corrosive gases which, may be deflected by down draught. Unless otherwise specified, the inner lining of the top 9m should be of acid resisting materials.	Stack will be externally insulated along with cladding sheet,hence no separate protection is required for top 9 m of stack.Top 5 m of stack internal can be with SS liner.	As per NIT

SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
30		Page 8 of 17	TECHNICAL SPECIFICATIONS HRSG	Both the stacks shall be suitably refractory lined from inside	It is mentioned that "both the stacks shall be suitably refractory lined from inside." Does it mean bypass stack + Main stack? As per OEM design guidelines refractory lining is recommended if the temperature of exhaust gas goes beyond 850°C otherwise Ceramic wool insulation with SS liner shall be sufficient. Kindly confirm. Also request to indicate MOC of both Stacks.	By pass stack shall be internally insulated with ceramic wool & SS liner. However, main stack shall be externally insulated with mineral wool of suitable thickness alongwith aluminium cladding. The inner lining of top 9 meter of the main stack should be of Acid resistance material.
31		Page 9 of 17	TECHNICAL SPECIFICATIONS HRSG	The main stack shall be internally insulated	Main stack shall be externally insulated. Not internal insulation.	
32	PC-135/136/E-601/PII/5.4	Page 5 of 39	DESIGN PHILOSOPHY (ELECTRICAL)	Diesel Engine for Black Start of GTG.	Request to confirm the GTG Starting during normal & black start condition. Proposed Kawasaki GTG is motor started and during black start 415 V power require which can be supplied through black start DG. Please confirm	Only diesel engine shall be supplied as a starting system for gas turbine. Motor is not acceptable as starting system for gas turbine
33		Page 28 of 39		Feeding of GTG Starting shall be from Diesel Engine and not from motor		
34	PNMM/PC135...136/E-601/P-II/Sec.-5.4	Page 3 of 6	TECHNICAL SPECIFICATION BATTERY	DC Battery type	As Battery specs DC battery shall be of Ni-cd type where as as per UPS spec battery should Lead acid battery is the requirement. Request to review and inform type of battery	All batteries shall be Ni-Cd type
35	PNMM/PC135..136/E-601/P-II/Sec.-12.0	Page 7 of 10	PERFORMANCE TEST	The performance guarantee test shall be carried out by operating the units continuously for a minimum period of 120 hrs, out of which 72 hrs of continuous period shall be considered for evaluation	We request to consider performance test of 72 hrs stable operation shall be observed out of which any 4 hrs data/ readings shall be considered for performance evaluation.	As per NIT
36	PNMM/ PC135..136/E-601/P-II/Sec.-13	Page 4 of 16	SITE WORKING AND SAFETY CONDITIONS	ELECTRICITY	We presume that Construction Power shall be provided at one point near proposed plant location free of Cost, Kindly confirm. Also indicate Voltage	As per NIT, voltage level 415V
37		Page 4 of 16	SITE WORKING AND SAFETY CONDITIONS	CONSTRUCTION WATER	We presume that Construction Water shall be provided at one point near proposed plant location free of Cost, Kindly confirm	As per NIT

SL.NO	REFERENCE OF BIDDING DOCUMENT				Bidder's Comments	OWNER / PMC's REPLY
	Part / sec	Page No.	Clause Reference	Subject (Clause Description)		
38	PNMM/PC135..136/E-601/P-II/Sec.-10.0	Page 3 of 38	SUBCONTRACTORS / VENDORS LIST	Enumerated below are the list of vendors for major bought-out components. Contractor shall select the final vendor from the below vendor list.	Request to include / approve the other reputed makes of major bought out items like Kawasaki for Gas Turbine and other supplier for HRSG also, those are meeting the tender requirement. Green Power is representing Kawasaki for this tender. Kawasaki Heavy Industries (KHI) in Japan is over a century history company, we have our own proven experience in jet engines & industrial gas turbine design and manufacturing since the 1930s. KHI heavy-duty gas turbine products are developed using simple construction & easy maintenance concepts, based upon its accumulated technologies through developments of various KHI industrial gas turbines with more than 10,000 installations worldwide. Green power will submit necessary documents for approval in later stage.	As per NIT
39			Vendor List of Electrical	FOR UPS & Battery	Request to include Hitachi for UPS & HBL and Amarraja for Ni-cd Battery.	As per NIT
40				SLD	Request to provide the electrical single line diagram for better understanding and suitable design.	Bidder may collect the relevant data during the site visit
41	Annexure -3B Block diagram of PANIPAT	Drg.No PC138-0000-0020	PLOT PLAN	HRSG generated super heated steam existing pipe line spec 20"-SX-2001-F2D	Kindly clarify the MOC. Piping material specification is not available for all lines.	Follow the pipe material specification as per the NIT
42	General		Disposal of Civil Concrete		As dismantling of RCC & PCC of existing civil structure in bidder's scope, kindly specify the area/ location or maximum distance from the site where the civil concrete has to be disposed off.	Bidder to discuss the same during the site visit
43				Site visit	As time before pre bid queries date was insufficient so site visit to all three locations is not completed, request you to accept our queries related to site work within 4 weeks from the date of pre bid meeting.	As per NIT

SL.NO	REFERENCE OF BIDDING DOCUMENT		Bidder's comments	OWNER / PMC Reply
	Clause Reference	Subject (Clause Description)		
1	Sec. - 4.1 6.12.16	All instruments including junction boxes provided in the GTG enclosure shall be provided with explosion proof enclosure and certified for the applicable area classification.	Inside GTG is classified as non hazardous area by supplying fresh ventilation air. Redundant ventilation fans will be furnished to provide ventilation air with high reliability. The ventilation fans will always be running when the gas is introduced to the GTG, so the instruments and electrical components inside GTG are not required to be explosion proof. This concept is widely accepted by others like EIL , ONGC etc	Hazardous Area Classification shall be zone 1, II A / IIB, T-3.
2	Sec. - 4.1 7.1	After pre-commissioning checks, system is checked out and response calibrated, the following loading procedure, or reasonable agreed alternate, will be followed for the unit. iii. Increase load to approx. 50% of design load and run for 30 min. - Reject load in one step. - Re-apply load in one step. vi. Re-apply load to 110% of design load and run for 30 min.	Test procedures are proprietary of GTG suppliers and have their own laid procedures and process. This to be discussed mutually during detailed engineering .	Shall be as per Section 12 of NIT and PTC 22.
3	Sec. - 5.2 5.3.4	Baseplate(s) shall be provided with drip containment and low point drains.	All baseplates are not fully self draining. Not all equipment is covered by the baseplate, so oil retaining wall should be provided around the equipment,	As per NIT
4	Sec. - 5.2 5.6.7	Regardless of the area classification and grouping specified in the requisition, the acoustic enclosure surrounding a gas turbine shall be regarded as a Zone 1 area in accordance with the IP code, or Class I Division 1 in accordance with the National Electrical Code NFPA 70 (latest editions, as applicable) when the ventilation system is inactive.	Same as SL. NO.1. Should the ventilation system is inactive, GTG shall be shutdown due to the lack of the cooling air, and the gas shall be stopped at outside the GTG. Therefore, the inside GTG will have no potential gas leak when the ventilation fans are not running.	Hazardous Area Classification shall be zone 1, II A / IIB, T-3,

SL. NO.	REFERENCE OF BIDDING DOCUMENT		BIDDER'S QUERY	OWNER'S / PMC REPLY
	Part/ Sec	Subject		
<b>Mechanical - General</b>				
1	P-II/Sec.- 5.2	The requirements of API shall be met before the mechanical running test of the gas turbine (combined Gas generator & power turbine) is performed.	Based on bidder's accumulated manufacturing and operating experience,mechanical running test for Gas turbine generator is not necessary.It will only comprise of schedule and cost implications.  Please confirm whether this is acceptable.	As per NIT
2	-	Gas Turbine Power Output	As per bidder's understanding, gas turbines unable to provide 20MW net power output at Site ambient temperature of 46 degC and 81% RH shall not be considered for evaluation.  Please confirm.	As per NIT
3	-	Fuel Gas Pool Price	Kindly provide the fuel gas pool price (per mmbtu) which will be considered for evaluation of works cost .	Refer Amendment.
4	-	Fuel Gas Price Escalation	Kindly clarify whether any escalation will be considered for fuel price in order to evaluate works cost (by NPV method over a period of 15 years).	As per NIT
<b>Mechanical - GTG</b>				
5	P-II/Sec.-10.0		Supplier's standardized sub-vendor that has proven operating experience would be used in addition to the vendor list included in the NIT and the same would be submitted to purchaser for approval.	As per NIT
6	P-II/Sec.- 4.1	explosion proof electric motor driven fans, designed to preclude build up of a hazardous atmosphere and to maintain the temperature inside the enclosure at 60°C or lower.	(1) Gas turbine ventilation fan motors are non-explosion proof because motor itself is located in non-hazardous area. (2) It is difficult to maintain the turbine inside temperature below 60 degC. The maximum ambient temperature itself is 46 Deg C, so it is very difficult to keep the temperature below 60 Deg C. If we increase the fan capacity more to keep the enclosure temperature within 60 Deg C, it may create changes in the ventilation air flow pattern (from inlet to outlet), so the Gas turbine casing may not get cooled uniformly.	As per NIT

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7	P-II/Sec. 2.0	Inert Gas flooding system or any latest extinguishing system for Gas Turbine as generator fire fighting with alarms and trip interlocks. Ultra Violet detectors as well as heat detectors are to be provided for Fire detection. 2 out of 3 voting logic of fire and gas detection system is to be considered for tripping of gas turbine generator.	<p>- As generator does not have any sources for fire, firefighting system for generator is not needed.</p> <p>- Also, total flooding type CO2 (or Inert Gas) Fire Fighting systems shall be provided for closed enclosure only. But, proposed GT Generator does not have any additional enclosure, it comes with cover only. So, Inert/CO2 FF system for Generator area is not needed.</p> <p>- UV detector is not recommended for high temperature applications. So, as per GT OEM standard, heat detector with 2oo3 logic will be provided.</p>	As per NIT
8	P-II/Sec.- 4.1	<b>ENCLOSURE</b> The enclosure shall be maintained at a positive pressure of 5mm WG with only one ventilation fan operating. Fan shall be sized for 125% of design air flow.	By the Supplier's standard practice, induced draft fan would be used. Pressure inside of the turbine package and accessory package is at a negative pressure of around 50mm WG. Fan size is 100% of the design air flow as per GT OEM standard.	As per NIT
9	P-II/Sec.- 5.2	Corrosion protection of the filter housing and elements, ducting and silencer is required. Unless otherwise specified all metallic air path components shall be of Type 304 stainless steel.	As per GT OEM standard , material of the air path of the filter housing and inlet ducting is carbon steel with painting. Perforated plate for the inlet silencer shall be 304 SS.	As per NIT
10	P-II/Sec.- 5.2	d) Enclosure shall be furnished with enclosure air temperatures indicators, differential pressure indicators, and alarm & trip switches for high enclosure air temperature and abnormal enclosure pressure.	Enclosure air temperatures indicators, differential pressure indicators, and alarm & trip switches for high enclosure air temperature and abnormal enclosure pressure are not provided as per GT OEM standard.	As per NIT
11	P-II/Sec.- 1A	Gas Turbine Generator (GTG) with black start operation	Availability of plant utility during black start would be clarified.	<p>Please refer clause No. 1.2 of Design Philosophy - Electrical (Section 5.4).Details regarding quantities of each utility to be informed by the Bidder</p> <p>Diesel Engine of suitable rating shall be provided for black start of GTG since no power shall be made available from existing facilities for cold start up of GTG HRSG. Only Diesel Engine shall be considered for black starting and even DC Motor is not acceptable. Details regarding quantities of each utility to be informed by the Bidder</p>



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12	P-II/Sec.- 2A	1.2.1. Power Generation Characteristics Generation Voltage : 11 KV Primary Distribution Voltage : 11 KV Generation frequency : 50 HZ Voltage variation : + 10% Frequency variation : + 6%	Frequency variation shall be less than +/- 5%.	Since GTG to be run in synchronism with state grid and frequency variation in state grid is in range of +/- 6%, GTG shall also be suitable for frequency variation of +/- 6%.
13	-	Gas Turbine Power Output at all ambient temperature	Please advise the required Gas Turbine Output for all ambient temperature range	As per NIT
14	P-II/Sec.- 2A	Fuel Gas Quality	Please verify the Rich gas properties since it deviates from Operating range. Our dew point calculation of Rich gas shows 6 degC at 40 kg/cm2a. It is essential for fuel gas line/Combustor design.	As per NIT
15	P-II/Sec.- 2A	Cooling Water Inlet temperature : 33 degC Outlet temperature : 43 degC Note:Allowable del T for design of exchangers/Generator system is 8 degC	Bidder's understanding as per inlet CW (Cooling water) temperature (33 degC) and outlet CW temperature (43 degC) is that the allowable del T for heat exchanger design can be 10 degC .  Please confirm.	As per NIT
<b>Mechanical - HRSG</b>				
16	Sec 1.0	Existing de-aerator will cater to the total HP BFW requirement.	Existing Deaerator and BFP shall be used and NFL shall provide required quantity of feed water at specified parameter at the terminal point.	As per NIT
	Sec 5.1	Deaerator datasheet to be filled by bidder		NA
17	Sec 2.0	MCR shall be achieved considering one burner under cleaning / maintenance.	We consider the duct burner made by certain number of element /nozzles. The system will be designed considering N-1 requirement, where N is the number of element.	As per NIT
18	Sec 2.0	Bidder shall also indicate the percentage load of GTG (MW) at which HRSG shall produce the design quality and quantity of steam without supplementary firing.	As per the specification requirement, HRSG design capacity of steam shall be 145TPH (100 + 45) @ 91 kg/cm2(g) and 510 °C at hook up point. This cannot be achieved at any GT load without supplementary firing.	As per NIT
19	Sec 2.0	Bidders to take care superheating coils mechanical stability, incase saturated steam flow becomes zero and bidder to furnish the details of protection measure of the same.	To meet the fresh air firing, Gas bypass system (Diverter damper / Bypass stack) shall be provided. Since Bypass stack is included, dry run capability for HRSG is not necessary. Owner to confirm.	Noted. However, sufficient water volume to provided in boiler drum after Low Low level trip/any other scheme to avoid any dry run of HRSG to protect HRSG and accessories during transient changeover of divertor,In case divertor damper is passing/not closed. Submit backup calculation for this.

NOTE: FOR TECHNICAL AMENDMENT PLEASE REFER PDIL/NFL WEBSITE.

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	Sec 4.3	HRSR shall also be designed for GTG full load when no steam is generated (dry run condition)		As per NIT
	Sec 4.3	The superheater sections shall be of drainable type <b>and shall permit dry running during HRSR startup and transient conditions.</b>		As per NIT
20	Sec 2.0	<b>Continous online GT exhaust</b> and stack monitoring system shall consisting of sampling probes, piping, analyzers, etc for the analysis of <b>Nox, CO and unburnt hydrocarbon</b> and Sox, Nox, O2, CO2 and CO respectively shall be provided <b>on GT exhaust</b> and Main stack.	Please clarify this requirement is for Continuous Emission Monitoring System (CEMS) at Bypass stack and Main stack.	As per NIT
21	Sec 2.0	pH, Conductivity, Silica, etc – For BFW, Blowdown and For Super Heated Steam	Since the NIT is having less detail about SWAS, We propose to consider the following analyzers. Please confirm. a) pH Analyser each one no for drum water, feed water and Super heated steam b) Silica Analyser each one for drum water and Super heated steam c) Specific conductivity analyser each one for drum water and feed water d) Cation conductivity analyser one no common for saturated steam and superheated steam. Please clarify.	As per NIT
	Sec 4.3	Provision for on-line analyzers for superheated steam and CBD for measuring pH, silica & conductivity should be made.		As per NIT
22	Sec-2.0	All volatile treatment	All volatile treatment in drum will cause FAC in evaporators & raisers. Hence it is not recommended. Instead we will follow HRSR OEM standard.	As per NIT
23	Sec-4.3	The HRSR will be completely insulated for minimum heat loss and personnel protection and externally cladded with Aluminium sheet cladding in case of externally insulated	The main HRSR is designed with internal insulation with carbon steel casing. Kindly confirm	Noted
24	Sec 4.3	The supplementary firing chamber shall be provided with refractory lining.	The internal insulation and liner material at duct burner zone is as per HRSR OEM standard. It shall be either compressed ceramic block without liner or internally insulated (mineral wool) and SS liner of High temperature resistant material (like AISI 321, SS 310 etc).	To be supplied as per HRSR OEM proven standards.
25	Sec 4.3	The stack shall be of self supporting steel stack, thermally insulated throughout the length of the stack to prevent condensation inside the chimney.	As the fuel is Natural Gas having maximum of 10 ppm sulphur, internal insulation for the Main stack is not required.  We propose to apply corrosion resistant paint at main stack internal for top 9m instead of internal lining. Corrosion resistant paint is more maintenance friendly solution.	NIT Conditions to be followed.
		The inner lining of the top 9m should be of acid resisting materials.		Noted.

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		The main stack shall be internally insulated.	In addition, we propose external insulation with Aluminium cladding throughout the length of the main stack.	NIT Conditions to be followed.
26	Sec 4.3	<b>Both the stacks</b> shall be suitably refractory lined from inside.	Bypass stack shall be provided with Internal Insulation and SS liner material. For main stack, external insulation shall be provided.	By pass stack shall be internally insulated with ceramic wool & SS liner. However ,main stack shall be externally insulated with mineral wool of suitable thickness alongwith aluminium cladding.
27	Sec 5.6	<b>Roofing :</b> 1.22 mm thick Aluminium Industrial troughed sheets shall be provided along with accessories in roofing work	Metaploy sheet of 0.7 mm thickness shall be provided.	As per NIT
<b>Mechanical - Piping</b>				
28	Sec 5.3	The calculation of wall thickness required for pipelines subject to internal and/or external pressure shall be based on the formulae and recommendations as given in ASME B31.1, B31.3 & IBR as applicable.	All pipes wall thickness shall be calculated as per ASME B31.1. For IBR approval Pipes thickness check will be done based on IBR requirement.	As per NIT
29	Sec 5.3	In any case a minimum corrosion allowance of 1.5 mm shall be considered while selecting the thickness.	0mm Corrosion allowance will be applied for Stain less Steel pipe.	Noted
30	Sec 5.3	Stress analysis/pipe support modification of existing piping along with hook up with existing lines shall be in Bidders scope.	Existing drawing / Isometrics and Analysis files shall be made available to bidder for the stress analysis at hook up location.	Analysis files for the existing piping system are not available, being older installation. So the bidder to collect data / drawing from site for their engineering.
31	Sec 5.3	Pipe, fittings, flange, gasket material & lines joint for various service with pipe size indicated as follows, NB 50MM & ABOVE NB 40MM & BELOW ----- -----	Pipe size of 50NB and below is considered as small bore pipe and with size of 65NB & above will be large bore pipe. Accordingly pipe size and Valve size for material, line joint, valve end etc. mentioned in the data sheet A1 and A2 shall be as follows, <b>NB 65MM &amp; ABOVE</b> <b>NB 50MM &amp; BELOW</b>	As per NIT
32	Sec 5.3	All piping interconnection from/to B.L of the GT-HRSG package to tie in points for all lines as marked in P&ID's and piping GAD's shall be in the Scope of BIDDER.	All Interface pipes shall be routed till battery limits only.	As per NIT
33	Sec 5.3	All steam vessels, de-aerators & steam piping shall have double isolation valves.	Double isolation valves shall be provided for steam lines with pressure greater than 40 bar.	As per NIT

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34	Sec 5.3	All pipes shall be hydro tested at shops for pressures as per standards and all erected piping shall be tested as per the requirement indicated in ASME B31.1 and IBR	All pipes shall be hydro tested at site only upon erection.	All testings for supply & erection shall be complied as per NIT,
35	Sec 5.3	All gate/globe valves falling in the following categories shall be provided with integral bypass valve, Class 600 and over - 150 mm and larger Class 300 & 150 - 350 mm and larger	Integral Bypass will be provided only for steam lines and feed water lines for categories mentioned in the CI No. 1.9.2.	As per NIT
36	Sec 5.3	All carbon steel valves of ANSI pressure rating upto class 150 and 300 shall have stainless steel trim (13% Cr) unless otherwise specified in Data Sheet	Seat, disc and other trim material shall be selected based on the service and manufacturer recommendation.	As per NIT
37	Sec 5.3	ANSI pressure rating class 600 and above shall have Stellite trim.	As per standard, we would like to propose as follows, 1. Class 600 & below or less than 370 deg C - Seat 2. Class 900 & above or more than 370 deg C - Seat & disc.	As per NIT
38	Sec 5.3	All valves except check valves shall be tested for seat tightness by air at a pressure of 6 kg/cm <sup>2</sup> (g) on both sides of seat.	Seat tightness for all valves (except butterfly valve) shall be tested as per ASME B16.34 with water as test fluid. For butterfly valve both body and seat shall be hydro-tested as per AWWA C504.	As per NIT (Refer Datasheet A2 SPECIFIC REQUIREMENT FOR VALVES-Note-1 & 2).
39	Sec 5.3	1.2 STEAM & BLOW-DOWN <b>BELOW 400°C</b> Pipe, fitting, flange material - A106 Gr.B / A234WPB/ A105	Carbon steel material shall be used up to design temperatures as indicated in ASME B31.1/ IBR standards.	As per NIT
40	Sec 5.3	1.1 STEAM TEMP. <b>400°C TO 515° C</b> Pipe, fitting, flange material - A335 P22, A234WP22, A182 F22	Following material shall be used for below mentioned design temperature, <b>454 to 525 deg C</b> - A335 P11/A234 WP11/ A182 F11 shall be used for pipe, fitting, flanges and A217 Gr.WC-6 / A182 Gr.F-11 for valve body/bonnet materials as allowed in ASME B31.1 <b>Above 525 deg C</b> - A335 P22, A234WP22, A182 F22 shall be used for pipe, fitting, flanges and A217 Gr.WC-9 / A182 Gr.F-22 for valve body/bonnet materials as allowed in ASME B31.1.	As per NIT

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41	Sec 5.3	GASKET for Sl. No. 1.1, 1.2, 1.3 are mentioned as RTJ	Gasket Shall be provided as per bidders standard practice ,which is successfully applied in other projects.	RTJ flange for >=900#.
42	Sec 5.3	All mandatory tests shall be carried out as per ASME Boiler & Pressure Vessel Code ASME Section-II.	All mandatory tests shall be carried out as per ASME B31.1.	As per NIT
43	Sec 5.3	Sl. No.6 NG pipelines from HRSG B.L. upto Tie-in point shall have minimum thickness as per SCH-XS schedule. The NG shall be aboveground/ underground (with proper wrapping coating as per applicable standards and codes).	NG pipeline thickness shall be as per the thickness calculation based on ASME B31.1.	As per NIT
44	Sec 5.3	If demolition of any existing structure / underground pipelines etc. in existing plant and any new construction for any interconnection services such as pipe/ cable racks steel structure as well as RCC foundation etc., outside battery limit is required by the bidder, it shall be in the bidder's scope. Backfilling/ re-routing of pipelines & making good the area for use shall also be in the bidder's scope.	NFL to provide details of existing buried piping, Cable duct, foundations etc in the Proposed site area, if any.	As per NIT
<b>Mechanical- HVAC and Fire fighting system</b>				

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45	SECTION 2.0 DESIGN BASIS	RH shall be 60% for air-conditioned areas.	Bidder understand that Owner require that RH shall be Maximum 60% for air-conditioned areas. However such RH Control can be maintained only for rooms air-conditioned by Ductable Split AC. For small rooms air-conditioned by wall mount Split AC / Ceiling Cassette type AC, RH cannot be controlled.	The substation and control room shall be fully air conditioned through HVAC system with redundant (1+1) system (Refer clause No. 5.12 of Design Philosophy - Electrical , Section 5.4 of Part - II).  The AC unit shall be a package type suitable for industrial use. Wall Mount Split A/c / Ceiling Cassett Type AC are not applicable.
46	SECTION 2.0 DESIGN BASIS	GTG Control room shall be considered as air conditioned at temperature $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ .	As per standard practice followed in HVAC System, with Split air conditioners, it is difficult to maintain $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . So we propose that GTG Control Room area shall be maintained at $24^{\circ}\text{C} \pm 2^{\circ}\text{C}$ .	As per NIT
47	SECTION 2.0 DESIGN BASIS	For summer ambient temperature may be taken as $46^{\circ}\text{C}$ to $24^{\circ}\text{C}$	Bidder understand that for summer ambient temperature may be taken as below: a) DBT (Dry Bulb Temp) - $46^{\circ}\text{C}$ b) WBT (Wet Bulb Temperature) - $24^{\circ}\text{C}$	As per NIT
48	SECTION 3.0 BIDDER'S SCOPE OF WORK	v. The proposed control system for GTG/HRSG shall be suitable for integration with vam (chilling) system, for installation at later stage.	Bidder understand that vam (chilling) system is not under the scope of Bidder.	As per NIT
49	SECTION 5.4 DESIGN PHILOSOPHY - ELECTRICAL	5.5 Complete fire alarm system with independent repeater panel at GTG control room and also at existing fire station which is located at a distance of approx. 900 meter shall be in the scope of bidder.  10.10 Complete fire alarm system with independent repeater panel at GTG control room and also at existing fire station which is located at a distance of approx. 900 meter shall be in the scope of bidder.	Please provide necessary details (e.g. exact location of existing fire station in the plot plan).	900 meter approx. distance has already been mentioned. However, bidder to collect all the data during site visit.
50	SECTION 5.4 DESIGN PHILOSOPHY - ELECTRICAL	10.9 The Fire Alarm System for GTG & HRSG Area shall be hooked-up with thy existing Fir Alarm System	Please provide necessary details (e.g. exact location of existing fire station in the plot plan and details of the Fire alarm panel in the existing fire station where hooking up to be done).	900 meter approx. distance has already been mentioned. However, bidder to collect all the data during site visit.

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51	TECHNICAL SPECIFICATION FIRE DETECTION AND ALARM SYSTEM	7.1.1 The system shall be modular and shall facilitate future extension / modification. Panel design and component selections shall be done for future extension up to <b>100/0</b> of specified zones or one zone whichever is maximum in each panel.	We presume that the word " <b>100/0</b> " implies <b>ten (10) percent (%)</b> here. Please confirm.	Noted
52	SECTION 5.7 DESIGN PHILOSOPHY - FIRE FIGHTING  TECHNICAL SPECIFICATION FIRE DETECTION AND ALARM SYSTEM	1.1 .....The complete system shall be designed in compliance with NFPA standard and local statutory norms required for GTG/HRSG Package. Further, the design, engineering shall comply with the requirements of the latest editions of the codes & standards relevant to this specification. .... The layout shall be strictly in compliance with NFPA especially with regard to clearance of mains from buildings/ structures, spacing of hydrants etc.  2.1 The system and equipment shall comply with relevant BIS (Bureau of Indian Standards) and other Indian/ International standards, as applicable. In case Indian standards are not available for any equipment, standards issued by IEC/ BS/ VDE/ IEEE/ NEMAINFPA or equivalent agency shall be applicable. In case of imported equipment, the standards of the country of origin shall be applicable if these standards are equivalent or more stringent than the applicable Indian standards.	We will provide all fire detection, alarm and protection system as per NFPA guidelines. Please confirm.	As per NIT
<b>Electrical</b>				
53	Part II/ Sec 4.2	The excitation system shall have proper field suppression equipment with properly rated DC field breaker and field discharge facility.	The description below for Field Circuit Breaker and Discharge Facility will not be applicable, because of that the standardized AVR for Gas Turbine Generator will have a PWM (i.e., Pulse Width Modulation) power converter including small discharge component, and use AC magnetic contactor for the field breaker properly for the required rating, but not using DC field breaker.	As per NIT

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54	Part II/ Sec 4.2	The system shall have high initial response to improve steady state and dynamic stability of the generator. The excitation system response time for static excitation system shall be less than 0.02 sec.	Bidder proposes to offer brushless excitation system with response time of 2 sec.	As per NIT
55	Part II/ Sec 4.2	Automatic Voltage Regulator shall be microprocessor based field programmable having proven state of art technology with following minimum features : Line voltage follower for rapid synchronisation....shall also be provided for controlling from generator control panel.	(1) Line voltage follower for rapid synchronization: This will be provided in Turbine Control Panel (TCP), so this requirement is functionally complied. (2) Thyristor units: FET based PWM power converter will be applied instead of Thyristor for this rating. (3) Separate remote manual control equipment: Proposal AVR will be a redundant system with two controllers which will have Auto and Manual mode in each controller respectively. Therefore, the required separate manual control equipment is not needed.	1- This is also required in AVR. Rest As par NIT.
56	Part II/ Sec 4.2	The direction of rotation of the rotor of the machine as viewed from the turbine end shall be clockwise.	The generator rotation direction shall be counter clockwise view from the gas turbine side.	Noted
57	Part II/ Sec 4.2	The complete assembled alternator vibrations must not exceed the limits specified in IS: 12075/IEC 60034, unless otherwise specified.	Vibration limit shall be as per ISO 7919-4 but not IS.	The generator shall fulfill vibration levels in IEC 60034-14, vibration grade A or B, whichever is more stringent.
58	Part II/ Sec 4.2	The excitation cubicles shall be self standing and sheet metal enclosed provided with swing doors at front & rear.	The following control equipment for Gas turbine package will be installed in air conditioned Local Control Compartment (LCC). <ul style="list-style-type: none"> <li>▪ Gas Turbine Control Panel (TCP)</li> <li>▪ Generator Protection Panel (GPP)</li> <li>▪ AVR cubicle (AVR)</li> <li>▪ Motor control center &amp; Distribution Panel</li> <li>▪ Battery &amp; Battery charger</li> </ul> The design of the above panels does not require rear side access hence the modular design of LCC does not provide space for rear side access.	The Excitation cubicle shall be separate self standing type as per clause No. 6.1.7.  TCP, GPP, AVR, Battery Bank & Battery Charger etc. shall be located in Control Room, whereas MCC and DB shall be located in Substation.  Clear Sapce in rear side of panels shall be provided as per NIT irrespective of rear side access as per NIT.
59	Part II/ Sec 4.2	The AVR panel shall be of minimum IP42 degree of protection and shall be located in AC room.	As per bidder's standard practice, AVR protection panel has IP20 protection.	As per NIT



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60	Part II/ Sec 5.4	The electrical system shall include but not limit to the following : c) .....including retrofitting at existing DGDB	Please clarify the make and year of existing switchboard	Bidder to discuss same during site visit.
61	Part II/ Sec 5.4	n) 11kV/3.3kV Extension Panels (if required)	Please clarify the make and year of existing switchboard	Bidder to discuss same during site visit.
62	Part II/ Sec 5.4	b) A clear space of 5M between the two Boards facing each other.	b) We suggest a clear space of 2.0 M between the two Boards facing each other to optimise the Electrical Room layout.	As per NIT
63	Part II/ Sec 5.4	5.14 False-Ceiling shall be provided in switchgear room, control panels room and SCADA room.	We do not recommended to have false ceiling in Switchroom but we do provide false ceiling in Control room.	As per NIT
64	Part II/ Sec 5.4	The equipment to be installed in indoor plant area shall be enclosed in dust, damp and vermin proof enclosure equivalent to IP: 54 as per IS. Except switch boards, all other equipment installed in AC room shall have IP-42 degree of protection.	For switchboard, we provide IP54 upto 1600A. Above 1600A rating, IP42 will be offered.	Above 1600 Ampere only incomers and bus couplers shall be IP-42 and other panels shall be IP-52. Below 1600A, complete 415V switch boards shall be IP-54. All other equipment installed in AC room shall have IP-42
65	Part II/ Sec 5.4	HRC Fuses with short circuit release.	HRC fuses without release shall be provided.	Switch with HRC Fuse, electronic thermal overload relay and earth fault proection, as per NIT shall be provided.
66	Part II/ Sec 5.4	Transformer	Please consider 10% margin capacity instead of 25% and 30%.	As per NIT
67	Part II/ Sec 5.4	The 11KV switchboards shall have minimum 40KA short-circuit ratings for 3 secs & 3.3KV switch board shall have 150MVA short circuit ratings for 3 secs and be suitably sized for the load and spare capacity foreseen	Please change the short circuit rating to 1sec instead of 3 sec.	3 secs as per NIT
68	Part II/ Sec 5.4	Each Rectifier-Cum-Battery Charger rating shall be minimum 2 times of the maximum load requirement.	Battery Charger for GT units would be suitable for 1 time of the total DC power requirement for GT safety shutdown.	As per NIT
69	Part II/ Sec 5.4	Battery Sets shall be rated to meet the total DC power requirement for 2 hour for switch gear battery & 4 hour for GTG auxiliary battery after complete power failure.	Battery sets for GT units would be suitable of 1 hour of the total DC power requirement for GT safety shutdown.	As per NIT
70	Part II/ Sec 5.4	New Copper bus duct shall be laid from respective Gas Turbine Generator to new GTG Transformer & from GTG Transformer to new 11KV switch boards at GTG 11KV substation.	Please clarify if connection from generator to transformer to switchgear should be isolated phase bus duct, please clarify if aluminium bus duct can be used for IPBD	Aluminium bus duct is not acceptable. This shall be as NIT.

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71	Part II/ Sec 5.5	115VAC 50 Hz shall be provided through UPS from two sources for control panel supply and rest all distribution shall be in bidder's scope.	Bidder's control system is designed to operate on 125V DC power supply for safer operation.	As per NIT
72	Part II/ Sec 5.5	The GTG Control System shall have necessary control functions for KW Control, KW Import Control, KVAR/Power Factor Control, Heat Recovery Application Interface, and Unfired Waste Heat Recovery System Control.	The KVAR/Power Factor Control should be done by the AVR, not TCS. Limited interface to Heat Recovery and Unfired Waste Heat Recovery System is considered. KW import control will not be provided in TCS	As per NIT
<b>I&amp;C</b>				
73	Part II/ Sec 5.5	-	Bidder understands that, the proposed CAPP will be considered as safe area except the area where fuel will be handled. Hence bidder will consider Ex-proof equipments according to the area segregation during detail design stage.	As per NIT, to be discussed during detail engineering.
74	Part II/ Sec 5.5	For measurements having interlock and control, the execution shall be 2003 only through use of three transmitters upto ESD system. The control shall be median control through hardwired repeat outputs from ESD marshaling cabinets.	Bidder understand that for same parameter which is used for protection and control, no separate sensors have to be used, the same signal connected to ESD can be repeated through AO and can be used in DCS for control. Employer to confirm.	Dual channel repeater shall have to be used in the marshalling for ESD. One output shall be fed to ESD for interlocking and second shall be fed to DCS for control.
75	Part II/ Sec 5.5	No Direct Process Switches (Pressure / Level/ Flow / Temp.) shall be used. However, if it's not possible to install transmitter for particular application online pressure/level switches (float type) may be used with specific approval of owner (NFL/PMC).	Bidder understand that for lube oil skids for pumps/fans installation of Pressure/level switches will be acceptable by employer.	Switches are not acceptable as per NIT.
76	Part II/ Sec 5.5	All field transmitters for pressure, d/p, level and flow shall be microprocessor based (dual compartment) SMART transmitters with "UNIVERSAL HART" protocol with latest revision.	Bidder will use the latest version of HART protocol, however the version number will be decides during detail engineering.	Noted
77	Part II/ Sec 5.5	2003 SOV to be considered for all Trip solenoids, and configured and hooked up properly in such a way that failure of one solenoid doesn't initiate a false trip. Trip solenoids shall be normally in energised condition and shall be de-energised to initiate trip.	Bidder understand that this is not applicable for HRSG BMS. However Dual coil solenoid will be provided for HRSG BMS. Employer to confirm.	Dual Coil solenoid valves are not acceptable as per NIT.

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	Part/ Sec	Subject		
78	Part II/ Sec 5.5	On-line gas analysers for the measurement of CO, O <sub>2</sub> , SO <sub>x</sub> , NO <sub>x</sub> and UHC (Un-burnt Hydrocarbon), etc. shall be Ex-proof as per area classification.	Bidder understand that CEMS for measuring the following parameter will not fall under Hazardous area classification. Hence Ex-proof need not to be considered, Employer to clarify.	As per NIT.
79	Part II/ Sec 5.5	All analysers shall be grouped area-wise and housed in a pressurised and air conditioned Analyser Shelter conforming to NAMUR recommendations.	Bidder understand that all CEMS analyzers will be placed in common CEMS shelter. And this is the bidder standard practice. Employer to confirm whether this is acceptable.	We require & under stand that bidder shall be placing all analysers in HVAC shelter as per NIT. Deviation if any may be clearly highlighted.
80	Part II/ Sec 5.5	..... Infrared configurators are also envisaged to enable the tuning of parameters in the field without opening the covers of Electronics unit in hazardous area.	Bidder understand that infrared configurators are optional. Analyzer can only be HART compatible.	Noted.
81	Part II/ Sec 5.5	Connectivity of these Analysers with CPCB/PPCB/HPCB portal shall be in bidder's scope. Bidder shall supply of required hardware for connecting these Analyser to the CPCB/PPCB/	Bidder understand that CEMS with necessary hardware to connect with CPCB will be in bidder's scope, however employer will provide the PLANT LAN with Internet to connect with CPCB.	Noted.
82	Part II/ Sec 5.5	DILUTION SYSTEM FOR SO <sub>x</sub> /NO <sub>x</sub> ANALYSERS	Bidder request employer to consider Hot wet extractive (non-dilution) type and insutive analysis also as option.	As per NIT.
83	Part II/ Sec 5.5	No flow switches shall be used. The same shall be achieved through flow transmitters, which shall be directly connected as analog input to DCS/PLC.	Bidder understand that flow switches can be used where ever the flow measurement is not possible by other means as mentioned by employer's spec, for example for lube oil cooler cooling water flow low	Can be considered in detail engineering provided no other method prescribed elsewhere in the NIT is feasible.
84	Part II/ Sec 5.5	I/P convertors are not required. All controls valves shall be equipped with SMART Electro-pneumatic positioned (Siemens make) with latest HART protocol,.....	Bidder requests employer to also consider other alternative vendors/makes.	As per NIT.
85	Part II/ Sec 5.5	Two numbers of Hand Held Communicator shall be provided for smart positioners in addition to those provided along with smart transmitters (Model Emerson 475 or latest).	Bidder requests employer to also consider other alternative vendors/makes.	As per NIT.
86	Part II/ Sec 5.5	All trip solenoid valves shall be 2oo3 with diagnostics.	Bidder's proposed HRSG BMS safety valve will be double coil solenoid valve. Please confirm whether this is acceptable.	Double coil solenoid valve shall not be acceptable as per NIT.
87	Part II/ Sec 5.5	All Solenoid Valves used in the whole plant shall be of HERION make only.	Bidder requests employer to also consider other alternative vendors/makes.	As per NIT.
88	Part II/ Sec 5.5	New CR should be sufficiently adequate to accommodate Instrumentation & Control for GTG & HRSG Control System like.....	Bidder's standard practice is to provide GT control System in GT control compartment located near the GT (field), however a remote operator desk will be provided at the Control room for remote operation and monitoring.	Placing remote monitor in the CCR shall be acceptable, however control room shall be adequate to accommodate all Instrumentation of GTG & HRSG.

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89	Part II/ Sec 5.5	...No interfacing is required through Modbus/Serial link between new DCS & existing DCS of Ammonia & SGP. Only one dedicated view only station is required at each existing DCS GTG control system and HRSG control system shall communicate with each other. No interfacing is required through Modbus/Serial link between new DCS & existing DCS of Ammonia & SGP. Only one dedicated view only station is required at each existing DCS room.	Bidder understand that, there is no requirement of interface with existing unit DCS, however a remote desk for only monitoring of HRSG and GT to be provided in old ammonia control room. Employer to provide tentative distance between the new and existing CR.	One view only station for monitoring of both GTG & HRSG shall be required in Ammonia Control room. Second view only station to monitor both GTG & HRSG shall also be required in SGP control room. The tentative distance of both control rooms shall be approx. 700 mtrs.
90	Part II/ Sec 5.5	Hardware required for the communication with the existing DCS in the service Boiler control room and Ammonia control Room shall be in the scope of the Bidder.	This clause is contradicting with the above clause employer to confirm.	Hardware required for View only Stations only.
91	Part II/ Sec 5.5	Online GTG and HRSG Block Efficiency monitoring and Control system shall be provided.	Bidder understand that, a program to be implemented in DCS logic to calculate the efficiency of HRSG online and display the same in Operator screen.	NIT ask for specialised software programme meant to evaluate efficiency of both GTG & HRSG to be provided and run.
92	Part II/ Sec 5.5	The master clock shall drive the slave display units.	Bidder request employer to provide the number of Slave display units required and approx. Location.	Will be decided during detail engineering.
93	Part II/ Sec 5.5	Outputs shall be Digital pulse, Analog & Ethernet. It should also have provision to synchronize with external system or synchronized with external system.	Bidder request employer to provide the detail of source of external system.	Ammonia DCS, SGP DCS & Urea DCS system.
94	Part II/ Sec 5.5	There shall be time synchronization facility available in DCS for diff. other sub-systems like ESD, etc. In this case DCS clock shall remain a MASTER clock and it will synchronize all other sub systems of the plant.	Bidder recommends time synchronization by a reliable and common source such as GPS based master clock system.	Noted
95	Part II/ Sec 5.5	Latest Bentley Nevada make Vibration Monitoring System (3500) along with sensors, monitors, cables, connectors etc. shall be supplied by the bidder. All instruments shall be highly reliable and shall conform to API 670.	Bidder will provide field proven Vibration monitoring system which will be equivalent to Bentley Nevada conforming to API 670, employer to confirm.	As per NIT.
96	Part II/ Sec 5.5	GTG shall have control panels installed in the main control room.....	Bidder's standard practice to provide GT control System in GT control compartment located near the GT (field), however a remote operator desk will be provided at the Control room for remote operation and monitoring.	Placing remote monitor in the CCR shall be acceptable, however control room shall be adequate to accommodate all Instrumentation of GTG & HRSG.

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97	Part II/ Sec 5.5	115VAC 50 Hz shall be provided through UPS from two sources for control panel supply and rest all distribution shall be in bidder's scope.	GT control system shall have a dedicated UPS. The GT UPS related alarm will be communicated to DCS via MOSBUS TCP/IP between GT control system and HRSG/BOP control system.	OK,UPS for both GTG & HRSG shall be required.
98	Part II/ Sec 5.5	Provision of View only stations at AFCP and Boiler control room is envisaged.	Please refer to point no.88.	One view only station for monitoring of both GTG & HRSG shall be required in Ammonia Control room.Second view only stayion to monitor both GTG & HRSG shall also be required in SGP control room. The tentative distance of both control rooms shallbe approx. 700 mtrs.
99	Part II/ Sec 5.5	.....Also Control System shall have the provision of CCTV Cameras & associated equipment for Live Video Monitoring of Rack-room, Engg. Room, MCC, other important locations inside CR/ Sub-station area and on important drives & Field Locations etc. subject to Max. of 32 Points.....	CCTV Cameras will not have any interface with the GT Control system, however CCTV system with cameras in multiple location will be provided and a dedicated CCTV monitor will be provided in control room for monitoring	Noted
100	Part II/ Sec 5.5	The gas turbine generator shall be provided with an electronic governor with hydraulic actuator for governor valves for controlling the shaft speed. I/H Converter of VOITH make and Electronic governor of Woodward make shall be used.....	Bidder will provide GT OEM standard hydraulic actuator and electronic governor	As per NIT.
101	Part II/ Sec 5.5	.....The metering station installation shall comply with the relevant ISO/ASME/API/ AGA Standards or better. Fuel Metering System shall be minimum 4-path Ultrasonic Flow-Meter having accuracy of 0.25%.....	Bidder proposes a common Ultrasonic Flow meter at the terminal point and individual flow meter for control purpose in GT and HRSG will be provided using orifice.	Not acceptable. NIT to be followed.
102	Part II/ Sec 5.5	Similarly, MMI between operator and Generator Protection & control, Transformer & Switchyard control shall be through operating station/keyboard and mouse and touch screens with a provision of touch screen masking.....	Bidder does not envisage any touch screen for GT or HRSG operator station. Employer to confirm.	As per NIT.
103	Part II/ Sec 5.5	For bypassing the field inputs for operational and maintenance requirements, common Key-operated hardwired enable switch located on hardwired console shall be provided. Individual bypasses shall be implemented through graphics on operator consoles. Bypassing shall be event recorded.	Bidder do not recommend any key-operated hardwired bypass switch for GT or HRSG operations. Employer to confirm.	As per NIT.

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104	Part II/ Sec 5.5	The GTG control system Monitors shall be installed in flush in the console as shall be applicable for DCS /PLC consoles for aesthetic look.	Bidder propose control system monitors are installed as stand alone and not a panel. Hence flush mount is not applicable.	Noted
105	Part II/ Sec 5.5	All the panels and cards of the systems shall have corrosive environment protection coating as per G3 of ISAS 71.04.	Bidder understand that there will be no corrosive environment inside the control building and GT compartment, Hence G3 coating as per ISAS 71.04 is not required, employer to confirm.	As per NIT.
106	Part II/ Sec 5.5	2 Nos. Server-Grade Engineering Stations with RAID 5 Configuration, in redundant mode, recommended for HRSG Control.	Bidder propose 1nos Engineering station will be enough for HRSG control. Employer to confirm.	As per NIT.
107	Part II/ Sec 5.5	All Field instrument shall be intrinsically safe as per area classification.	Bidder understand only instrument located in hazardous area as per the plant area classification will be intrinsically safe.	As per NIT.
108	Part II/ Sec 5.5	DCS & ESD system for HRSG shall be from the same vendor.	Bidder request employer to relax on the selection of ESD PLC as per OEM recommendation.	As per NIT.
109	Part II/ Sec 5.5	JB shall be as per area classification and minimum IP 65, Instrument cable trays shall be Aluminum.	Bidder propose to provide all cable tray made of GI (hot dip galvanized)	As per NIT.
110	Part II/ Sec 5.5	...All the system hardware of DCS shall have ISA G3 level corrosion protection....	Bidder understand that there will be no corrosive environment inside the control building and GT compartment, Hence G3 coating as per ISAS 71.04 is not required, employer to confirm.	As per NIT.
111	Part II/ Sec 5.5	LVS shall be such that it can be used for continuous viewing (24 hours). LVS with wireless mouse/keyboard/HDMI cable upto 50 meters shall be provided.	Bidder propose LVS with KVM switch instead of wireless mouse/keyboard/HDMI.	Not acceptable. NIT to be followed.
112	Part II/ Sec 5.5	100% fault tolerance and dual redundancy in DCS shall be for Controller cards, all communication cards and buses, all control buses, all type of common cards in the system, all power supply modules, all I/O modules for closed loops and interlock I/Os, buses, Ethernet modules.	Bidder understand that DCS will have dual controller with (1) one working and (1) one hot-standby.	As per NIT.
113	Part II/ Sec 5.5	All digital output from DCS and ESD shall drive interposing relays of OMRON make	The bidder will follow the specification for interposing relay however we request employer to provide choice on relay make.	As per NIT.
114	Part II/ Sec 5.5	Client-server Architecture is NOT acceptable.	Bidder request employer to accept client-server architecture also as many DCS vendor offer client-server architecture.	As per NIT.
115	Part II/ Sec 5.5	The system shall be microprocessor based programmable logic control (PLC) with fault tolerant redundant processors based on TMR/QMR technology.	TMR will be applied for GT control system, however for HRSG BMS SIL3 dual redundant Safety System will be applied, employer to confirm.	HRSG BMS shall be realised in ESD system with specoification as per NIT.
116	Part II/ Sec 5.5	The resistance to earth is to be less than 1 ohms. To achieve this an array of parallel electrodes may be used.	Bidder understand that the earthing resistance requirement shall be met as recommended DCS OEM.	OK, However earthing resistance shall be on lower most range limit of DCs manufacturer recommandations.

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117	Part II/ Sec 5.5	Vibration monitoring system shall be Bentley Nevada make 3500 series only.	Bidder request Employer to add few more vendors or allow bidder to offer VMS equivalent to Bentley Nevada.	As per NIT.
<b>Civil</b>				
118	P-II/Sec. 5.6	Dismantling and disposal of existing RCC/PCC flooring/pavement, existing RCC foundation and backfilling of the same with good soil and site grading,if required as per site conditions.	Please give the exact scope of dismantling. (For example :what would be the quantity of dismantling , and what is the lead distance for disposal ?)	Bidder to visit site & collect relevant required data.
119	P-II/Sec. 5.6	The good soil required for back filling after dismantling and disposal of existing RCC foundations shall be arranged from outside of NFL Boundary area.	Please clarify regarding the scope of identification of good soil, lead distance.	Bidder to explore the availability of good soil from near by location.
120	P-II/Sec. 5.6	Walls facing plant side should be blast proof.	Please clarify regarding the dimension of wall.	Shall be as per codal provision.
121	P-II/Sec. 5.6	Special considerations	Please explain bundle pull forces	Shall be as per equipment vendor drawing.
122	P-II/Sec. 5.6	Foundations shall be so designed that natural frequency of the foundation system shall not resonate with the following c) 2 x Operating speed of the machine d) Critical speed of the machine (for centrifugal machines)	As per IS 2974 For the design of dynamic equipment foundations, Check for 2 x Operating speed and check for critical speed of the machine is not indicated.	Shall be as per NIT.
123	P-II/Sec. 5.6	All underground structures including top surface of foundation shall be painted with two coats of cold bitumen	It is not a standard practice to paint top surface of foundation.	Shall be as per NIT.

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1	4.1	2	3.0.iii	Permanent mounted Oil Centrifuge with purifier (water removal) & clarifier mode (sediment/soil material removal).	This type of equipment is not required for the operation of GTG package.	As per NIT
2	4.1	2	3.0.iv	Motor driven hydraulic ratchet / gear turning device.	This is equipped with an electric VSD start motor also used for turning the Gas Generator rotor.	Noted.
3	4.1	3	3.0.vi	Intake air system including cleanable filters, cleaning system, expansion joints, ducting and insulations.	The combustion air intake filters can be supplied as pulse cleaning type (mainly in desert areas) or static type with disposable filter elements, i.e. not cleanable.	As per NIT
4	4.1	3	3.0.viii	Acoustic enclosures for the Gas turbine, Load Gear Box and electric generator.	Acoustic enclosures are required for GT and Gear box. Electric generator does not require any enclosure and is suitable for outdoor installation.	As per NIT . Electrical Generator shall also be provided with enclosure.Complete system excluding HRSG shall be inside shed with suitable capacity EOT crane.
5	4.1	3	3.0.xiv	Local Gauge Boards and Local panels as listed elsewhere.	The package is intended for automatic remote operation without Local Gauge Boards and Local Panels.	As per NIT.Local Guage Board wherever required by process shall be included.
6	4.1	8	6.5.1	The lubricating oil tanks shall be of SS.	Siemens recommendation is to use a CS lube oil tank. This is the standard solution, which is used in the vast majority of the projects. An tank in SS will increase the price considerably with minimal technical advantages.	As per NIT
7	4.1	8	6.7.4	...minimum three RTD's/ duplex thermocouples per bearing.	All main bearings have two duplex RTD's per bearing	As per NIT
8	4.1	10	6.11.1	The enclosure must be quickly detachable and equipped with lifting lugs for easy removal.	The enclosure is fixed once installed at site. The walls are equipped with large hinged doors for easy maintenance and GG roll-out.	As per NIT
9	4.1	10	6.11.3	...temperature inside the enclosure at 60°C or lower...	Temperature inside the enclosure can be higher than 60°C. All equipment is suitable for use in the actual temperature.	As per NIT.
10	4.1	11	6.12.1	The gas turbine generator shall be provided with an electronic governor with hydraulic actuator for governor valves for controlling the shaft speed.	The GTG is provided with an electronic digital governor with servo-motor gas fuel valves for controlling the shaft speed.	As per NIT.
11	4.1	13	6.12.16	All instruments including junction boxes provided in the GTG enclosure shall be provided with explosion proof enclosure and certified for the applicable area classification.	This clause is in conflict with clause 6.11.4 "All instrument & electrical items, which are energised before start of pressurisation or remain energised after loss of pressurisation, shall be suitable for area classification". The area inside the GT enclosure is considered to be safe area, hence only equipment specified in 6.11.4 is suitable for hazardous area.	As per NIT. All instrument shall be suitable for hazardous area classification as per standard practice.
12	4.2	4	5.4	The direction of rotation of the rotor of the machine as viewed from the turbine end shall be clockwise.	The direction of rotation of the generator rotor is counter-clockwise at drive end, facing shaft end.	Noted.
13	4.2	5	5.16	The machines shall be provided with suitable fire detection system for the windings & moisture detection.	As the generator is located outdoors without an enclosure, no fire protection system is included.	As per NIT.
14	4.2	5	5.17	The complete assembled alternator vibrations must not exceed the limits specified in IS: 12075/IEC 60034, unless otherwise specified.	The generator fullfils vibration levels in IEC 60034-14, vibration grade A.	The generator shall fulfill vibration levels in IEC 60034-14, vibration grade A or B, whichever is more stringent.



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15	4.2	5	5.19	The generator shall be outdoor type installed in fully enclosed shed from all sides. Overhead EOT Crane capable to lift the rotor of both Generator and turbine shall be provided.	Crane not included, proposed generator is suitable for outdoor installation without enclosure.	In addition outdoor type generator , shed shall also be provided. Moreover, EOT Cranes capable to lift the rotor of both Generator and turbine shall also be provided.
16	4.2	5	6.1.4	Redundancy of Rotating diode bridge	Rotating diode bridge not redundant, diode fault protection included.	As per NIT.
17	4.2	5	6.1.6	Excitation cubicle shall be provided with cooling arrangement such as cooling fans of nonmetallic type along with air filters. Cooling fan shall be of redundant type.	Cooling of excitation cabinet according to manufacturers standard design.	As per NIT.
18	4.2	5	6.1.7	The excitation cubicles shall be self standing....	Excitation cabinet located on directly on the generator	As per NIT.
19	4.2	6	6.3.6	Cooling tube shall be mounted on the side of the generator (Shall not be top mounted).	Siemens well-proven standard is top mounted coolers.	As per NIT.
20	4.2	9	6.5.2	The rotor windings shall be of high silver bearing copper & of VPI (vacuum impregnated).	Rotor winding is not VPI, as salient pole design is applied.	As per NIT.
21	4.2	9	6.6.4	Flame / Heat and smoke detectors...	Not applicable since no enclosure is required.	As per NIT.
22	4.2	10	6.8.9 6.8.11	Stator (line) Terminal Box Neutral terminal Box	Neutral terminal Box and Stator (line) Terminal Box are combined in one large box including CT's, PT's, surge arrester and NGR (10A).	As per NIT.
23	4.2	11	6.9.3	The star point of the generator shall be connected to earth through neutral grounding resistor (NGR) so that the maximum earth fault current through the resistor & stator winding is limited to full load current of generator	Generator suppliers strongly recommend high-resistance grounding. The standard maximum earth fault current is 10 A (10 s).	As per NIT.
24	5.2	15	5.8.5	(5.7.3.4) Addition: Three gas sensors shall be provided at each of the following locations: a) ventilation air inlet b) ventilation air outlet. c) Combustion air inlet. The set point for alarm shall be at 20% of lower flammable level (LFL) and shut down at 60% of LFL.	Being a safe area installation, Siemens wellproven standard using two gas detectors in the ventilation air outlet is applied. The set point for alarm is 5% of LFL and shut down at 10% of LFL.	As per NIT
25	General				What gas composition should be used for performance calculations/guarantee ?	Please refer Amendment of Annexure-1.2 specifying the NCV to be considered for guaranteed NG consumption.
26	General				Reference ambient conditions for performance calculation is 46°C RH 81% ? @46°C only 33% RH is possible due to that relative humidity is defined as the ratio of the partial pressure of water vapor in a gaseous mixture of air and water vapor to the saturated vapor pressure of water at a given temperature. The possible relative humidity decreases with higher ambient temperatures. The relative humidity is based on a wet bulb temperature of 30.7 °C, which is the highest measured wet bulb temperature in the world (according to Munters). This occur a couple of hours per year in Al-Manamah, Bahrain. What RH should be used?	Bidder to note that as specified in NIT, inlet air temp & RH are to be considered individually while calculating Power output of GTG at site conditions wrt ISO conditions . For calculating Guaranteed Power output of GTG excluding all internal consumptions , corrections shall be based on all applicable site conditions wrt ISO conditions ie inlet air temp 46 deg C ,81 % RH , inlet / outlet duct pressure losses , ambient pressure etc. Bidder to furnish in their Bid calculations for the same with supportive docs & internal consumptions details.
27				General Query	Can a bidder (EPC) quote with multiple sub suppliers (GTG) and put more than 1 bid. In other words, is there a restriction for a bidder to put up only one bid or they can put more than 1 bid with alternative sub-supplier (GTG). Please clarify	Please refer Clause 17 of section 1.0 of Part-1 of NIT.

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	Part/ Sec	Page No	Clause No	Subject		
1	PART II- TECHNICAL SECTION – 2 DESIGN BASIS- NANGAL	289/1527	1.1	Net Capacity of HRSG shall be 100 MTPH of HP Superheated steam & Superheating of 45 MTPH of Saturated steam (excluding internal consumption of auxiliaries of GTHRSG Package) measured at battery limit	Bidder understands that 100TPH of Superheated Steam is generated from HRSG with feed water coming in HRSG at normal 145 deg.C. In addition to this HP steam, a 45TPH of Saturated steam coming from process at 95 kg/cm2(g), 305 deg.C needs to be superheated till normal 510 deg.C @ 91kg/cm2(g) at outlet of superheater. Total HP Steam from Superheater is 145TPH at 91kg/cm2g, 510 deg.C. Kindly confirm bidder's understanding is correct.	As per NIT
2	PART II- TECHNICAL SECTION – 2 DESIGN BASIS- NANGAL	294/1527	1.7	The MOC for exchanger's tubes shell be SS 316 or better grade to take care high chloride level.	Bidder clarifies that PHE type exchanger with MOC as SS316 will be provided for GTG Lube oil cooler. Kindly confirm the same is acceptable to PDIL/NFL.	As per NIT
3	PART II- TECHNICAL SECTION – 2 DESIGN BASIS- NANGAL	298/1527	2.2	For Superheating of Saturated Steam at Hookup point: Turndown Min. 30% of Design Capacity	Please confirm the minimum 30% of Saturated Steam is available from the existing plant	During Normal plant operating conditions saturated steam shall be available as per requirements of HRSG however Bidder to provide safety to the Import steam superheater coil in the event of non availability of saturated steam from upstream plants.
4	PART II- TECHNICAL SECTION – 2 DESIGN BASIS- NANGAL	306/1527	6.0	GTG shall be provided suitable for outdoor installation. Ventilation system for GTG enclosure shall be as per latest IS/IEC.	Bidder understands that GTG to be placed outdoor and hence no additional shed to be provided for GTG & Auxilliaries. PDIL/NFL to confirm	As per NIT . Complete system excluding HRSG shall be supplied with enclosure inside the shed with suitable capacity EOT crane.

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5	PART II- TECHNICAL SECTION – 2 DESIGN BASIS- NANGAL	306/1527	7.0	All required utilities & NG shall be supplied at the battery limit (i.e. Hook up point) of GTG/HRSG by client. Bidder to take hook-up from all Utilities & NG. Process steam NG & all utilities shall be provided with double block and bleed arrangement with Fig-8 type arrangement for positive isolation at GTG/HRSG B.L. by Bidder. All tie-ins may be taken up in shutdown prior to Hook up Shut down.	Bidder understands that Fig-8 type arrangement means spectacle blind to be provided. PDIL / NFL to confirm if this understanding is correct.	Noted
6	BIDDER'S SCOPE OF WORK	310/1527	1.1 c	Gas turbine's exhaust gas system consisting of internally insulated duct with necessary expansion joint to HRSG.	As per good engineering practice Gas turbine's exhaust system is externally insulated with necessary expansion joint to HRSG. PDIL/NFL to confirm the same is acceptable.	As per NIT
7	BIDDER'S SCOPE OF WORK	311/1527	1.1 l	All necessary Hoists / EOT / Overhead Cranes or equivalent suitable lifting arrangement and other lifting machines / tools of suitable capacity for carrying out future maintenance work of GTG / HRSG.	Bidder clarifies that the EOT crane is not envisaged as the GTG/HRSG are designed for outdoor installation. All necessary Hoists or equivalent suitable lifting arrangement and other lifting machines / tools of suitable capacity for carrying out future maintenance work of GTG / HRSG. will be provided. PDIL/NFL to confirm the same.	As per NIT . Complete system excluding HRSG shall be supplied with enclosure inside the shed with suitable capacity EOT crane.
8	BIDDER'S SCOPE OF WORK	311/1527	1.1 t	OWS (Oily Water Separation).	OWS system will be provided for GTG-HRSG system only. Kindly specify the ppm level for outlet of OWS system.	As per NIT
9	PROJECT DESCRIPTION	286/1527	3.3	i) Instrument Air Receiver, OWS (Oily Water Separation)	OWS system will be provided for GTG-HRSG system only. Kindly specify the ppm level for outlet of OWS system.	As per NIT
	BIDDER'S SCOPE OF WORK	311/1527	1.1 g	Soil investigation for the offered plot and detailed study prior to site clearance including existing piling / raft foundation in the plot (if any). Bidder shall fully analyse the site during visit to its satisfaction regarding soil condition and existing piling work	1. NFL to provide the details of underground pipes/cables/drain pipes passing through the plot area. 2. As per site visit there are many trees to be cleared for which Environmental	

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10	BIDDER'S SCOPE OF WORK	313/1527	2.0 k	Site clearing including removal/utilization of existing foundations and cleaning	clearance needs to be taken by NFL. 3. There is a railway track adjacent to plot area. The new piperack needs to be crossover this track. Any permissions from concerned department to be taken by NFL. 4. As per site visit NFL had confirmed to use the existing piperack for HP Steam, feed water, LP steam and other utilities from Battery limit to GTG-HRSG plot area. PDIL/NFL to provide existing piperack drawings and structural calculations to work out the pipe routing and strengthening.	As per NIT
11	BIDDER'S SCOPE OF WORK	313/1527	2.0 e	All civil foundation, Building, Pavement, drainage, Rain water harvesting & all other Civil works.	Bidder understands that Rain Water Harvesting includes only the connection of roof /building drain pipes to existing drain collection pit near the plot area. No underground civil tank, softener/water treatment plant and pumping system is not considered. PDIL/NFL to confirm the same.	As per NIT
12	BIDDER'S SCOPE OF WORK	357/1527	2.0 ii	Construction power / water shall be given at one point free of cost. Arrangements for further distribution of power and water by laying pipeline etc. shall be arranged by the bidder.	PDIL / NFL to give the location for Construction power and water in the plant area	
13	BIDDER'S SCOPE OF WORK	356/1527	2.0 a	System engineering, preparation of heat and mass balance diagrams across all items along with calculations, system wise Design Criteria document, PFD, P&ID, Utility Balance Diagram, system interlock logic diagram with its description, Line list, Load List, Hazardous area classification diagram, All equipments and instrument data sheets, Precommissioning, Commissioning operation & maintenance manual, Sensitivity Study, Plot Plan etc.	PDIL/NFL to confirm the Hazardous area classification zone for proposed GTG-HRSG plot.	Bidder to furnish Hazardous Area Classification Drawing in conformity with BIS 5572 Latest Edition.
14	BIDDER'S SCOPE OF WORK	346/1527	3.3	Bidder shall also indicate the percentage load of GTG (MW) at which HRSG shall produce the design quality & quantity of steam without supplementary firing.	Kindly explain this requirement.	As per NIT

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15	BIDDER'S SCOPE OF WORK	347/1527	3.3	Oily water system shall be provided by Bidder and deoiled water shall be sent to existing ETP plant further.	PDIL/ NFL to share the overall plant layout in	As per NIT
16	Design basis- Nangal	300/1527	3.2-ii	Largest motor in NFL Nangal is rated 2.5MW, 11KV DOL BFW pump always kept on Auto-start mode. While running in isolation condition from grid, bidder shall design a scheme for load shedding of Township and Urea plant 11KV, 2250KW CO2 compressor motor so that BFW pump (2.5MW) takes start without affecting the voltage and frequency of GTG.	PDIL/NFL to provide largests motor datasheet	Bidder shall collect the data during site visit.
17	SCOPE OF SERVICES:	312/1527	2.0	Bidder shall carry out Hazop Study for the entire GTG-HRSG package including Tie in points. The Independent chairman for the Hazop study shall be appointed by the Bidder after consultation / Approval from Client. The Bidder shall incorporate all the recommended safe guards of Hazop report.	Bidder understands the independent Chairman means Consultant for Hazop Study.	As per NIT
18	INSTRUCTIONS TO BIDDER	334/1527	4.0	The bidder has to perform the system study keeping in view the integration/ hook-up of new electrical power system of GTG & HRSG with existing electrical power distribution system and synchronisation of GTG with State Electricity Board grid power to be done at 66 KV switchyard bus. Based on these studies in all conditions of parallel/ synchronised operation of all sources of power, if fault level happens to be more than the existing fault level of the plant, bidder to consider fault current limiting devices etc. to limit the fault within the existing level.	Bidder will conduct the study during engineering. If fault current limiting device is requires then it will be at extra cost	Bidder to access requirement of fault limiting device at this stage only and include cost of the same, if applicable in their lumpsum price. .  Any cost towards fault limiting device shall not be payable extra at any stage.
19	DESIGN PHILOSOPHY- Electrical	425/1527	1.14	The generator shall be outdoor type installed in fully enclosed shed from all sides. It should have overhead EOT Crane capable to lift the rotor of both Generator and turbine	Please confirm whether bidder has to provide complete shed for GTG with EOT crane arrangement or GTG should be outdoor installation with internal crane arrangement inside the enclosure.	As per NIT . Complete system excluding HRSG shall be inside shed with suitable capacity EOT crane.
20	DESIGN PHILOSOPHY- Electrical	426/1527	2.4	Transformer sizing shall be done considering all the motors with DOL starting.	Bidder understands the auxiliary transformer sizing should be done for normal running auxiliary load	Auxiliary Transformer Sizing shall be decided considering loads of GTG-HRSG package and design philosophy.

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21	DESIGN PHILOSOPHY- Electrical	427/1527	2.5-l	All the Transformers, Switchgears, MCCs, PCCs etc. shall have capacity for future requirements. The Margin shall be as follows: a. HV Transformer: 30% is added to the Maximum Normal Running Load	Bidder understands this requirement is for auxiliary transformer only.	The margin shall be applicable for all the transformers as well as switchboards.
22	DESIGN PHILOSOPHY- Electrical	428/1527	4.1.3	11 KV $\pm$ 10%, 50 Hz, +5%, 3 Ph, 3 W with resistance earthed neutral & 3.3 KV $\pm$ 10%, 50 Hz, +5%, 3 Ph, 3 W with resistance earthed neutral	Please confirm whether all distribution equipments shall be designed for as per Generation frequency +/-6% or +/-5%	All distribution equipment shall be designed as per NIT i.e. $\pm$ 5%.
24	DESIGN PHILOSOPHY – ELECTRICAL	445/1527	6.8.2	The rating of power transformers shall be selected on the basis of load and future load growth. For future load growth the following provision shall be made :- - 25% spare capacity in HV transformers - 30% spare capacity in LV transformers	Please confirm the future margins on transformers because on both clauses 2.5-l & 6.8.2 it is mentioned reverse.	Please consider the Following provision :- - 25% spare capacity in HV transformers - 30% spare capacity in LV transformers
25	DESIGN PHILOSOPHY- Electrical	427/1527	2.5-l	All the Transformers, Switchgears, MCCs, PCCs etc. shall have capacity for future requirements. The Margin shall be as follows: a. HV Transformer: 30% is added to the Maximum Normal Running Load		
26	DESIGN PHILOSOPHY – ELECTRICAL	446/1527	6.9.2	The 415V motors having rating 75 KW & above shall be controlled through air circuit breakers with combined motor protection relay. All LV motors of rating 15KW & above shall be provided	Bidder understands 415V all motor having rating 15kW & above shall be designed as per 415V, 50kA, Type-2 coordination	All 415 V Motor below 75 kW feeders shall have components as per Type-2 Coordination as well as Fault level 50 KA for 1 Sec.  415 V Motors of rating 75 kW and above shall be controlled through ACB with motor protection relay.
27	Schematic Diagram	810 & 829/15	PC140-1202	Motor feeder above 110KW with air circuit breaker	Please confirm motor above 75kW or 110kW should be controlled through Air circuit breaker.	The 415V motors having rating 75 KW & above shall be controlled through air circuit breakers with combined motor protection relay.
28	DESIGN PHILOSOPHY – ELECTRICAL	448/1527	6.12.7	All the HT/LT motors in complete GTG/HRSG package shall have standby motors.	Bidder clarifies that it is not technically feasible to have standby motors for all HT/LT motors.	As per NIT.

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29	DESIGN PHILOSOPHY – ELECTRICAL	448/1527	6.13.3	The DC motor shall have standby motor/s..	Bidder clarifies that it is not technically feasible to have standby motors for all DC motors.	As per NIT
30	SPECIFICATION SHEET 415V SWITCHBOARDS	527/1527	SYSTEM DETAILS	Rated Frequency with Variation 50 Hz $\pm$ 10 %	Bidder clarifies that frequency variation will be as per generator frequency variation $\pm$ 6%	415V Switchboards shall be suitable for $\pm$ 5% frequency variation.
31	TECHNICAL SPECIFICATION DESIGN	591/1527	4.1.7	All motors shall be energy efficient type of efficiency class of 'IE2' as per IS 12615: 2011.	Please clarify which shall be followed? We are bidding with IE2	All 415V motors shall be minimum IE2 as per latest edition of IS: 12615
32	DESIGN PHILOSOPHY ELECTRICAL	448/1527	6.12.3	All 415V motors shall be minimum IE3 as per latest edition of IS: 12615.		
33	TECHNICAL SPECIFICATION INDUCTION MOTOR (TS-0810)	591/1527	4.2.1	All LV motors shall be totally enclosed fan cooled (TEFC) conforming to IC-411 as per IS: 6362.	Please specify the KW rating for large motors	Rating shall be decided by the LSTK bidder
34	TECHNICAL SPECIFICATION INDUCTION MOTOR (TS-0810)	591/1527	4.2.1	All LV motors shall be totally enclosed fan cooled (TEFC) conforming to IC-411 as per IS: 6362.	Please specify the KW rating for motors	Rating shall be decided by the LSTK bidder
35	TECHNICAL SPECIFICATION INDUCTION MOTOR (TS-0810)	591/1527	4.2.2	In case of CACA construction is adopted for large motors, the same shall conform to IC0161 as per IS: 6362.	Please specify the KW rating for motors	Rating shall be decided by the LSTK bidder
36	TECHNICAL SPECIFICATION INDUCTION MOTOR (TS-0810)	591/1527	4.2.3	In case of CACW construction is adopted the same need require approval from owner/consultant and the same shall conform to ICW 37A 91 as per IS: 6362.	Please specify the KW rating for motors	Rating shall be decided by the LSTK bidder
37	Cable Specifications	651/1527		Cable specifications for 1.1 KV (E) / 3.3 KV (UE) / 11 KV (UE)	Please provide 66KV cable specifications.	Bidder to design in conformity with Indian standards/IEC and NIT.

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38	Site Visit			As per site visit additional 66KV Feeders 2nos. to be installed at substation	Please provide 66KV Isolator, SF6 Breaker s	Bidder to design in conformity with Indian standards/IEC and NIT.Refer ES-8035 for isolator.
39	TECHNICAL SPECIFICATION CAPACITOR BANK & ASSOCIATED EQUIPMENT (TS-0823)	734/1527		"Shunt Capacitor Bank & Associated Equipment" required for system power factor improvement.	Please clarify is it for Aux load of GTG & HRS	if there is lowering of power factor due to new system, Capacitor bank to be included for power factor improvement..
40	Master Index	1 of 3	NA	1 X 20 MW GTG (GAS TURBO GENERATOR) ,WITH BLACK START OPERATION	We understand for three site the capacity requirement of 20 MW at site rated condition is NET basis which means gas turbine shall be capable of generating 20MW+ Plant Aux consumption. Please confirm.	As per NIT.
41	ITB	19/1527	8.1.1.1 III	GTG unit must be in satisfactory operation at least from 01.03.2016 to date of issue of ITB	We understand that the proposed Gas turbine must have 8600 continous fired hours or more in a single installation in a commercial fertilizer plant COGEN application to be qualified to quote for the current offer. Please confirm.	As per NIT.
42	ITB	19/1527	8.1.1.1 III	GTG unit must be in satisfactory operation at least from 01.03.2016 to date of issue of ITB	Please confirm that experience gathered on field validation engine shall not be considered for Gas Turbine-generator PTR	As per NIT.
43	ITB	19/1527	8.1.1.1 III	The bidder shall also submit documentary evidence to the effect that the proposed GTG manufacturer for the subject tender must have supplied at least 1 no. GTG of minimum capacity 25 MW (ISO, Industrial Heavy Duty)	As per our understanding of degrdation due to temperature, elevation etc, gas turbine of ISO capacity 30 MW or higher will be required to meet the 20 MW capacity required at site rated condition (46C, 81% RH, more than 220 m elevation). Please clarify the basis for 25 MW ISO capacity. We understand Water/steam injection for power augmentation is not allowed as Dry Low Nox (DLN) system is required.	As per NIT
44	Schedule of Prices	216/1527	PNMM/PC 140/E-601/P-I/Annx-1.2	GCV of Natural gas - Bidder to provide	There can be varaiation in calculation method for GCV that will lead to variation in final GCV value and works cost. Bidder requested owner to provide the composition of guarantee gas and corresponding GCV.	PI refer Amendment.



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45	Technical, Section 2.0	289/1527	1.1	..Industrial Heavy duty..	Please clarify the features necessary to be qualified as "Industrial heavy Duty" gas turbine.	As per NIT
46	Technical, Section 2.0	289/1527	1.1	..Industrial Heavy duty..	Aeroderivative gas turbines are industrial turbines. Is their lack of experience in Indian Fertilizer Plant Cogen application can be a reason for their ineligibility?	As per NIT
47	Section 4.1 TECHNICAL SPECIFICATIONS GAS TURBINE	Page 3 of 17	3.0 xvii	Gas Turbine manufacturer's standard Control and Monitoring System.	Different OEM has different level of redundancy for unit control panel - Triple Modular redundancy is industry wide accepted as the best option. However, if there is a control system offer with dual modular redundancy, we understand there will be a penalty to ensure equality of treatment to all OEM. The penalty will be as per established industry practice.	As per NIT
48	SECTION – 2.0/ DESIGN BASIS	3 of 21	1.1	Net capacity of HRSG shall be 100MTPH of HP superheated steam& Superheating of 45MTPH of superheated steam (Excluding internal consumption of auxiliaries of GT –HRSG package) measured at battery limit	HRSG Superheater capacity shall be of 145 MTPH (100 MTPH in HRSG and 45MTPH Import Saturated steam to be superheated) with common Main steam piping up to Battery limit. Kindly confirm	As per NIT
49	SECTION – 2.0/ DESIGN BASIS	7 of 21	1.6	Fuel gas quality	We request to clarify the supplementary fuel case to be guaranteed for PG test.	As per NIT
50	SECTION – 2.0/ DESIGN BASIS	8 of 21	1.7	Boiler blow down shall be routed to be existing ETP.	Kindly clarify this point and inform us the requirement of HRSG blow down water terminal point connection also inform us the required blow down water temperature at terminal point	Boiler blow down water shall be sent to ETP after cooling to less than 50 deg.C through pump .
		16 of 21	3.3	Boiler blow down shall be sent to existing ETP plant for further treatment.		
51	SECTION – 2.0/ DESIGN BASIS-	16 of 21	3.3	The desire stack temperature should be below 120°C	Achieving stack temperature of below 120°C without using Make up water heater will not be thermodynamically possible as the minimum BFP water temperature inlet at Economiser is 145°C. Kindly clarify	Refer Amendment.
52	SECTION – 2.0/ DESIGN BASIS T	19 of 21	4.4	SO2 from gas fired boiler	Kindly clarify this point and inform us the requirement of SOX (ppm) in HRSG stack.	As per NIT
53	SECTION – 2.0/ DESIGN BASIS	19 of 21	4.4	Pollution control	Kindly confirm reference O2% level (dry) emission to be guaranteed.	As per NIT

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54	SECTION – 2.0/ DESIGN BASIS	20 of 21	4.5	Noise generated shall not exceed 85 dBA at 1 m distance from the source of	Overall plant noise analysis is the responsibility of EPC supplier. The noise level for superheater safety valve & start up vent valve will be 110 dBA at 10 m distance.	As per NIT
				Individual equipment under normal range of operating conditions.		
55	SECTION – 2.0/ DESIGN BASIS	20 of 21	5	FIRE FIGHTING SYSTEM	Bidder understands that extension of existing Fire Hydrant system for GTG - HRSG plot in Bidder's scope. No Fi-Fi system is considered.. Kindly confirm.	As per NIT.
56	SECTION – 4.3 / TECHNICAL SPECIFICATIO N - HRSG	3 of 21	3.1.8	The HRSG will be completely insulated for minimum heat loss and personnel protection and	The main HRSG & ducting is designed with internal insulation with carbon steel casing. Kindly confirm	As per NIT.
				externally cladded with Aluminium sheet cladding in case of externally insulated		
57	SECTION – 4.3 / TECHNICAL SPECIFICATIO N - HRSG	4 of 17	3.1.20	Supplementary firing chamber shall be provided with refractory lining.	As per our design guidelines refractory lining is recommended if the temperature of exhaust gas goes beyond 850°C otherwise Ceramic wool insulation with SS liner shall be sufficient. Kindly confirm	As per NIT
				The stack shall be of self supporting steel stack, thermally insulated throughout the length		

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58	SECTION – 4.3 / TECHNICAL SPECIFICATIO N - HRSG	8 of 17	3.7.1	of the stack to prevent condensation inside the chimney.	Kindly clarify this point both are contracting	By pass stack shall be internally insulated with ceramic wool & SS liner.However ,main stack shall be externally insulated with mineral wool of suitable thickness alongwith aluminium cladding.
		8 of 17	3.7.6	Both stack shall be suitable refractory lined from inside.		
		9 of 17	3.11.6	The main stack shall be internally insulated.		
59	DESIGN PHILOSOPHY – INSTRUMENT ATION	Page 11 of 125	5.1	The Hazardous Areas are Zone 2, and all Instruments shall conform to Exd or Exia, Gr.IIB+H2 Temp class T4 to CENELEC EN 50018, & 50020	Shall be as per approved Hazardous area layout.	All Instrumentation shall be strictly suitable for hazardous area Zone 2 and shall confirm requirement of ITB.
60	DESIGN PHILOSOPHY – INSTRUMENT ATION	Page 14 of 125	7.1	Silica analyser shall be of HACH make only	Silica is part of SWAS but given under CEMS specs. Client to clarify	SWAS is OK.Separate Sampling point also to be provided for Laboratory.
61	DESIGN PHILOSOPHY – INSTRUMENT ATION	Page 23 of 125	8.0	Continuous measurement of SOx by UV fluorescent absorption method	Shall be as approved vendor Standard	As per NIT
62	DESIGN PHILOSOPHY – INSTRUMENT ATION	Page 23 of 125	8.0	The NOx Analyser shall be based on chemiluminescence's principle	Shall be as approved vendor Standard	As per NIT
63	PNMM/PC140/ E-601/P-II/ SEC 5.4	31 OF 39	6.12.3	All 415V motors shall be minimum IE3 as per latest edition of IS:12615	There are discrepancy in tender which mentions both IE2 & IE3 motors. We have envisaged IE2 motors only. Kindly confirm	There is no discrepancy i.e. IE2 and IE3 motors.  All 415V motors shall be IE3 as per latest edition of IS: 12615
64	PNMM/PC140/ E-601/P-II/ SEC 5.4	8 of 15	5.4.1	The starting current i.e breakaway current of 415V motor shall not exceed the values indicating in IS 12615.	Starting current shall be limited to IS 12615 standard exclusive applicable tolerance. Kindly confirm	Starting current indicated in IS 12615 shall be inclusive of applicable tolerances. No further tolerance shall be applicable.

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65	general					Bidder to Provide Non-Return Valve (NRV) and Motor Operated Valve (MOV) at HRSG outlet for High Pressure Superheated Steam Header.And,also for saturated steam inlet line

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1	PNMM/PC140/E-601/P-I/Annx-1.2	GCV of Natural Gas (BTU/SM3) (A): Bidder to provide	Kindly furnish GCV to be considered for Guarantee condition. Also confirm composition of natural gas for that GCV, density, pressure and temperature to be considered for Guarantee condition.	Please refer Amendment of Annexure-1.2 specifying the NCV to be considered for guaranteed NG consumption.
2	PNMM/PC140/E-601/P-II/Sec. 1.0	Gas Turbine Generator (GTG) with black start operation : 1 x 20 MW at Site Condition i.e. 46 OC & 81% RH	Kindly confirm barometric pressure to be considered for guarantee condition and for design condition.	Refer NIT & design condition to be considered
3	PNMM/PC140/E-601/P-II/Sec. 1.0	OWS (Oily Water Separation)	Kindly confirm oil firing is not applicable to offered GTG, also elaborate requirement of OWS system.	Spliage Oil / Floor washing oil within the battery limit to be collected in a Pit and after Oil removal by Oil Skimmer, deoiled water to be pumped to existing ETP.
4	PNMM/PC140/E-601/P-II/Sec. 2.0	LP STEAM PARAMETERS (AT HOOK-UP POINT):-	Kindly clarify LP steam system in proposed GTG-HRSG project.	Blowdown steam to be connected existing LP header
5	PNMM/PC140/E-601/P-II/Sec. 2.0	BOILER FEED WATER (BFW) QUALITY AT HOOK-UP POINT	Kindly confirm Pressure & Temperature of BFW water for guarantee condition. Min temperature of feed water is indicated as 104 deg C, kindly confirm whether HRSG is to be designed for 104 deg C as feed water.	Normal Pressure & temp. of BFW to be considered.
6	PNMM/PC140/E-601/P-II/Sec. 2.0	FUEL GAS QUALITY	Kindly confirm fuel GCV for Lean & rich gas in BTU/Sm3. Also confirm gas composition (Lean or rich) , Density & GCV of fuel to be considered for guarantee condition. Kindly confirm Natural gas pressure and temperature & density to be considered for guarantee condition.  Kindly confirm that gas is suitable to burn in GTG & HRSG, no impurities are present in	As per NIT  Gas conditioning skid is to be provided.
7	PNMM/PC140/E-601/P-II/Sec. 2.0	Atmospheric Pressure,	Kindly confirm pressure for guarantee condition.	NIT conditions shall be followed.

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8	PNMM/PC140/E-601/P-II/Sec. 2.0	Incoming Natural Gas, Instrument Air, Cooling water, BFW, Saturated Steam and outgoing HP saturated steam (HRSG generated), LP steam & Superheated steam shall be provided with DCS indication of Pressure, Temperature & Flow at GTG/HRSG Battery Limit (Hook-up	Kindly clarify saturated steam and LP steam requirements in GTG-HRSG project.	Incoming Natural Gas, Instrument Air, Cooling water, BFW, superheated Saturated Steam and outgoing HP superheated steam from HRSG , LP steam, Nitrogen & incoming saturated steam etc. shall be provided with DCS indication of Pressure, Temperature & Flow at GTG/HRSG Battery Limit (Hook-up point)
9	PNMM/PC140/E-601/P-II/Sec. 3.0	Bidder must check site specific Air quality , Natural gas fuel quality and Site Particulate matter in view of Existing Coal fired boilers and all protections to be taken care for offered GTG-HRSG	We request to provide air pollutent values to be considered for filter design.	NIT conditions shall be followed.
10	PNMM/PC140/E-601/P-II/Sec. 3.0	EOT/Overhead Crane/ equivalent lifting machines/tools of suitable capacity for carrying out future maintenance work of GTG	Kindly confirm GTG shall be outdoor installation.	GTG shall be under shed and EOT/Overhead Crane/ equivalent lifting machines/tools of suitable capacity for carrying out future maintenance work of GTG shall be in Bidder's scope.
11	PNMM/PC140/E-601/P-II/Sec. 3.0	Access road damaged during plant revamp will be repaired fully to the satisfaction of owner	Kindly confirm scope for revamping	NIT conditions shall be followed.
12	PNMM/PC140/E-601/P-II/Sec. 2.0	BFW Supply Temperature,	Kindly confirm Pressure & Temperature of BFW water for guarantee condition.	NIT conditions shall be followed.
13	General Point-1		Existing piperacks shall be utilized for routing all utilities, kindly confirm.	Bidder to collect details during site vist.
14	General Point-2		We request NFL to furnish drawing indicating routing marked for cabling upto existing switchyard. Also confrim elevation to be maintained for cable rack	Bidder to collect details during site vist.
15	General Point-3		We request NFL to furnish drawing indicating routing marked for cabling upto existing raw water transfer pumps. Also confrim elevation to be maintained for cable rack	Bidder to collect details during site vist.
16	General Point-4		Kindly confrim Gas line routing from terminal point need to be considered underground.	Bidder to collect details during site vist.

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1	PNMM/PC140/E-601/P-II/Sec. 2.0	MOC / line size / Pressure rating of Existing Line - Refer Interface P&ID	Interface P&ID has piping class for various pipings. These piping class are not mentioned in piping design basis document. Please clarify whether piping design basis document is to be followed for piping design. Else, provide piping class to be considered.	Bidder to follow piping design basis regarding pipe class based on design pressure and temperature
2	PNMM/PC140/E-601/P-II/Sec. 2.0	Mechanical Design : 114 kg/cm2g	The mechanical design pressure shall be as per IBR requirements. The HRSG shall be designed only for normal pressure at battery limit i.e. 102 kg/cm2(g).	Shall be as per NIT
3	PNMM/PC140/E-601/P-II/Sec. 2.0	Mechanical Design : 538 deg C	As the steam temperature is 510 deg C. the design temperature of main steam line shall be 515 deg C	Shall be as per NIT
4	PNMM/PC140/E-601/P-II/Sec. 2.0	Silica in steam - 0.012	Silica in steam will be maintained at 0.02 ppm which is same as feed water silica	Shall be as per NIT
5	PNMM/PC140/E-601/P-II/Sec. 2.0	Boiler feed water conductivity $\leq$ 20	Boiler feed water conductivity shall be provided 0.2 Micro mhos/cm	Shall be as per NIT
6	PNMM/PC140/E-601/P-II/Sec. 2.0	HRSG shall be designed to run normally at 65 TPH with provision to ramp up to rated capacity of 100 TPH in 2 minutes	Ramp up rate is 10% MCR/min within burner turndown range. So from 65 TPH to 100 TPH shall be achieved in 3.5 minutes (approx).	Shall be as per NIT
7	PNMM/PC140/E-601/P-II/Sec. 2.0	HRSG shall be designed for a turndown of min. 30% of Rated capacity at normal GTG load without opening the start up vent.  Bidder shall also indicate the percentage load of GTG (MW) at which HRSG shall produce the design quality & quantity of steam without supplementary firing.	20 MW at 46 deg C & 81% RH is normal load of GTG, kindly confirm.	Shall be as per NIT
8	PNMM/PC140/E-601/P-II/Sec. 2.0	Steam drums shall be designed for water storage time of minimum 3 minutes between normal water level and drum low level trip corresponding to MCR capacity	Steam Drum storage time shall be 1.5 minutes from NWL to LLT. This is typical for HRSG as the stand-by feed pump is usually capable of starting up and providing the desired head & flow within less than a minute.	Shall be as per NIT

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9	PNMM/PC140/E-601/P-II/Sec. 2.0	Since hot BFW is being supplied in place of DM water at amb. Temp. Bidder to design the system to recover heat from flue gas exhaust to get maximum efficiency and min. NG consumptions, Bidder shall furnish the detailed scheme along-with Bid documents. The desired stack temperature should be below 120°C.	The objective of achieving 120 Deg C at stack is an appreciable objective; and, the options for the same can be suitably explored within the fertilizer complex which can utilize the extracted energy in different forms. This needs to be studied and approved by you.	Shall be as per NIT
10	PNMM/PC140/E-601/P-II/Sec. 2.0	Boiler blow down shall be sent to existing ETP plant for further treatment	Kindly provide quenching philosophy for blowdown water	Boiler blow down water shall be sent to Cooling water return header after cooling to less than 50 deg.C through pump
11	PNMM/PC140/E-601/P-II/Sec. 2.0	As per MINAS, CPCB and PPCB norms	Please provide emission values to be considered	Shall be as per NIT
12	PNMM/PC140/E-601/P-II/Sec. 2.0	Noise generated shall not exceed 85 dBA at 1 m distance from the source of individual equipment under normal range of operating conditions.	1.Continuous running equipment like FD fan, Control valve shall have noise level of 85 dBA at 1m. 2. Safety valve and startup vent being intermittent operated shall have noise level of 115 dBA at 1m. being intermittent operated. 3. Relief valve shall be without silencer and noise shall be as per vendor input.	Shall be as per NIT
13	PNMM/PC140/E-601/P-II/Sec. 4.3	The design of the HRSG module shall be based on field erected unit with as much equipment already pre-assembled as practical. The size and weight of modules shall be based on site transportation requirements and limits.	Please note that the HRSG shall be supplied in the form of Pressure part Harps to be assembled & erected at site. Please provide the transportation limits from nearest national highway to job site in terms of length, width, height & tonnage.	Noted  for transportation limit Bidder to collect the data from Statutory bodies.
14	PNMM/PC140/E-601/P-II/Sec. 4.3	HRSG shall also be designed for GTG full load when no steam is generated (dry run condition)	HRSG is not designed for dry run condition. There shall be a diverter damper installed to enable GTG running in simple cycle.	Noted. However, sufficient water volume to provided in boiler drum after Low Low level trip to avoid any dry run of HRSG to protect HRSG and accessories and submit backup calculation for this.
15	PNMM/PC140/E-601/P-II/Sec. 4.3	HRSG shall be designed to produce the superheated steam at rated capacity with GTG shutdown. Required accessories along with FD fan shall be considered accordingly.	Noted. We shall consider 1x100% Fresh Air FD Fan for the same. Fans shall be non-API. Fan design and performance testing procedure shall be as per vendor standard.	NIT conditions shall be followed and Fan shall be as per API standards.
16	PNMM/PC140/E-601/P-II/Sec. 4.3	The HRSG will be completely insulated for minimum heat loss and personnel protection and externally clad with Aluminum sheet cladding in case of externally insulated.	HRSG pressure part casing shall be internally insulated construction with insulation blankets, and SS or CS liner as per required design temperature. The outlet duct to stack shall be externally insulated with mineral wool and aluminium cladding.	Noted
17	PNMM/PC140/E-601/P-II/Sec. 4.3	The supplementary firing chamber shall be provided with refractory lining.	In the transition duct of HRSG from burner downstream upto inlet of superheater we shall use compressed ceramic block which does not need liner material. Refractory is not needed and not used in our design.	To be supplied as per HRSG OEM proven standards.



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18	PNMM/PC140/E-601/P-II/Sec. 4.3	Sufficiently large clear spaces shall be left between the individual tube banks of all the heating surfaces to provide easy personnel access to the heating surfaces.	Space for personnel access will be provided between modules. Typically a module consists of 6-8 harps.	To be supplied as per HRSG OEM proven standards.
19	PNMM/PC140/E-601/P-II/Sec. 4.3	The super heater sections shall be of drainable type and shall permit dry running during HRSG startup and transient conditions.	HRSG operation during startup and transient conditions shall be carried as per the procedure described in Operation & Maintenance Manual provided by Thermax. During initial cold/warm startup the diverter damper is modulated in order to maintain the metal temperature within the acceptable limits.	NIT conditions shall be followed.
20	PNMM/PC140/E-601/P-II/Sec. 4.3	Both the stacks shall be suitably refractory lined from inside.	Bypass stack shall be internally insulated with ceramic wool and liner. Main stack shall be externally insulated (for personnel protection) with mineral wool and aluminium cladding.	NIT conditions shall be followed.
21	PNMM/PC140/E-601/P-II/Sec. 4.3	Standard procedure for leak test at site shall be adopted and the details for the same shall be furnished before leak test, at site.	Please note, leak test is not required as HRSG casing is seal welded.	NIT conditions shall be followed.
22	PNMM/PC140/E-601/P-II/Sec. 4.3	Adequate number of sampling points for saturated steam, superheated steam, drum water, feed water, etc. shall be provided by the Bidder. The sampling points shall be complete with nozzles, valves and connections. The sample piping shall be of stainless steel SS 304. All sample coolers shall be grouped and provided at ground level.	Steam and water analyser system (SWAS) has provision of grab (manual) sample as well. Hence, separate sample coolers are not required.	NIT conditions shall be followed.
23	PNMM/PC140/E-601/P-II/Sec. 4.3	All utility consumption should have flow meters installed and should give trouble free operation	We shall consider flow meter only for feed Water and Natural Gas. For other applicable utilities we shall provide the utility consumption values.	NIT conditions shall be followed.

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24	PNPM/PC-140//E-601/P-II/5.5	Bi-color level gauges may also be provided if indicated by Licensor.	Bi-color level gauges are typically suitable for high pressure application, hence, we shall consider bi-color level gauges for steam drum. Please confirm.	Noted and acceptable.
25	PNPM/PC-140//E-601/P-II/5.5	The visible range of level gauge shall be selected to cover the operating level or the operating range of level instruments provided for the vessel.	We shall select level gauge covering the operating level of the vessel.	NIT conditions shall be followed.
26	PNPM/PC-140//E-601/P-II/5.5	Bonnet shall be provided with cooling fins or extension when the fluid temperature is 230 C and more.	This shall be decided by the control valve vendor to meet the process requirement/ suitability.	NIT conditions shall be followed.
27	PNPM/PC-140//E-601/P-II/5.5	Valve packing shall be Glass filled Teflon for temperature below 180 C and graphite for steam services and temperatures above 180 C.	This shall be decided by the control valve vendor to meet the process requirement/ suitability.	shall be review during detail engineering.
28	PNMM/PC140/E-601/P-II/Sec. 12.0	The performance guarantee test shall be carried out by operating the units continuously for a minimum period of 120 hrs., out of which 72 hrs. of continuous period shall be considered for evaluation.	For performance test 72 hrs stable operation shall be observed out of which any 4 hrs data/ readings shall be considered for performance evaluation.	NIT conditions shall be followed.
29	PNMM/PC140/E-601/P-II/Sec-5.3	All steam vessels, de-aerators & steam piping shall have double isolation valves.	Double isolation valves shall be provided for operating pressure greater than 40 kg/cm2(g).	NIT conditions shall be followed.
30	PNMM/PC140/E-601/P-II/Sec-5.3	AUXILIARY COOLING WATER AND SERVICE WATER SYSTEM (FRESH WATER APPLICATION), SERVICE AIR SYSTEM- EFSW PIPES TO ASTM A53 OR EQUIVALENT	We shall consider ASTM A106 Gr.B	NIT conditions shall be followed.
31	PNMM/PC140/E-601/P-II/Sec-5.3	STEAM LINES (TEMP<400 OC), CONDENSATE BLOW DOWN, BOILER FEED SUCTION, DISCHARGE & RECIRCULATION- ≥50 NB- Flanged	In general all large bore valves above 900 class shall be butt welded.	NIT conditions shall be followed.
32	PNMM/PC140/E-601/P-II/Sec-5.3	Trim Combination Number	Trim combination number shall be selected as per process requirement.	NIT conditions shall be followed.
33	PNMM/PC140/E-601/P-II/Sec-5.3	Ball valves or plug valves shall be provided for oil systems.  All shut off valves on oil system shall have leakage ANSI B 16.104 class VI.	Please note oil firing is not applicable. As per EM184/E-1/P-II/2.0- Design Basis document HRSG supplementary firing fuel is only Natural gas. Hence, all clauses pertaining to oil firing/oil systems is not applicable for us and shall not be considered.	NIT conditions shall be followed.
34	PNMM/PC140/E-601/P-II/Sec. 5.1		This specification is not applicable for HRSG and not considered	Section 5.1 is to be considered wherever applicable.

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35	PNPM/PC-140//E-601/P-II/5.5	Air registers for each burner shall be provided with pneumatic cylinder for remote operation from the system and it shall be linked with oxygen trimming.	Air registers are not applicable for HRSG Duct burners. Hence O2 trim control is not envisaged.	Noted

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	Part/ Sec	Page No.	Clause No.	Subject		
1	PNMM/PC14 0/E-601/P- II/Sec. 2.0	14 of 21	3.2, iii	Largest motor in NFL Nangal is rated 2.5MW, 11KV DOL BFW pump always kept on Auto-start mode. While running in isolation condition from grid, bidder shall design a scheme for load shedding of Township and Urea plant 11KV, 2250KW CO2 compressor motor so that BFW pump (2.5MW) takes start without affecting the voltage and frequency of GTG.	Noted. However, please clarify the sequence while starting of the Co2 compressor motor when BFW pump is running.	Bidder to discuss same during site visit.
2	PNMM/PC14 0/E-601/P- II/Sec. 3.0	4 of 8	1.1, k	Complete Integration of Electrical and Instrumentation with the existing system.	Please clarify the exact scope of renovation and integration. If the existing panels are to be extended, then the details of the existing panels will be required. Please furnish the same.	Bidder to discuss same during site visit.
3	PNMM/PC14 0/E-601/P- II/Sec. 3.0	8 of 8	3.2	Utilities like – Nitrogen, Instrument Air (Dry Air), Service Air, Cooling Water, Boiler Feed Water, DM Water, <b>Power for black start</b> , Service Water etc. which will be made available at the B/L (Hook-up with existing system). However Bidder to indicate requirement of these utilities along with offer.	In PNMM/PC140/E-601/P-II/Sec. 2.0, Clause 3.1 (page 13 of 21), it is mentioned as "The Gas Turbine Generator shall be with black start operation". Please clarify whether black start power arrangement is in Bidders scope or NFL will give the Black start power at battery limit.	Black start emergency power shall be supplied by NFL. Diesel engine for starting system of gas turbine shall be supplied by Bidder.
4	Single Line Diagram			Drg. No. PC140-0000-0801	Please clarify the scope & type of connection between 66kV GTG bus and the Isolator before NGE-1 & NGE-2.	Refer cl. No.1.3 of Design Philosophy - Electrical & SLD. For more details, Bidder to visit site for hook up & modification in existing system.
5	Single Line Diagram			Drg. No. PC140-0000-0801	As per the scope demarcation in the SLD, modification in existing system is not in Bidder's scope. Please confirm.	Refer cl. No.1.3 and 1.4 of Design Philosophy - Electrical & SLD. For more details, Bidder to visit site for hook up & modification in existing system.

SL. NO.	REFERENCE OF BIDDING DOCUMENT				BIDDER'S QUERY	OWNER'S / PMC REPLY
	Part/ Sec	Page No.	Clause No.	Subject		
1	ANNEXURES TO PART II: TECHNICAL ANNEX.-2B	1885 of 1897		SOIL TEST REPORT FOR Nangal Section 6.4.2	Recommendations are specified for safe bearing pressure for footing at 2.5m depth. Bidder requests recommendations for Net Safe Bearing Capacity at depths 3.0m, 3.5m, 4.0m and 4.5m for various sizes of footings.	Refer Clause 3.1 of Section 5.6. (Soil investigation report of nearby proposed areas for AFCP is enclosed for reference only. The actual detailed Geo-technical investigation work shall be carried out at the desired location by the bidder in the proposed site area. On the basis of Geo-technical investigation report and relevant codes, bidder shall prepare foundation design criteria indicating minimum foundation depth, bearing capacity, design depth of water table, recommended type foundations for different type of equipments, buildings, tanks, towers etc. and corrosion protection treatment for underground concrete works in view of presence of harmful chemicals in soil of water if any.)
2	SECTION 5.6 - ENGINEERING DESIGN BASIS CIVIL, STRUCTURAL & ALLIED WORKS	1025 of 1897	1.1	Scope dismantling and disposal of existing RCC/ PCC flooring / Pavement, existing RCC foundations	The allotted plot for GTG-GRSG Project is free of any existing structures, hence, dismantling is not envisaged. Kindly confirm the same. We request NFL to confirm safe distance to be maintained from existing diesel tank.	1.Refer Clause 3.1 of Section 5.6.(If demolition of any existing structure / underground pipelines etc in existing plant and any new construction for any interconnection services such as pipe/ cable racks steel structure as well as RCC foundation etc., outside battery limit is required by the bidder, it shall be in the bidder's scope.) 2.Distance from existing diesel tank shall be as per code.
3	SECTION 5.6 - ENGINEERING DESIGN BASIS CIVIL, STRUCTURAL & ALLIED WORKS	1025 of 1897	1.1	Shed shall be constructed over GTG and roofing shall be done with 1.22 mm thick Aluminium Industrial troughed sheets along with accessories	GTG shall be open installation, hence, not applicale.	NIT conditions shall be followed.
3	SECTION 5.6 - ENGINEERING DESIGN BASIS CIVIL, STRUCTURAL & ALLIED WORKS	1025 of 1897	1.1		Disposal of debries and excess soil shall be done within plant premises. Kindly confirm the same.	Bidder to discuss same during site visit.
	SECTION 5.6 - ENGINEERING DESIGN BASIS CIVIL, STRUCTURAL & ALLIED WORKS	1025 of 1897	1.1		The allotted plot and cable rack routing consists of trees, bidder requests customer to provide fairly levelled land with all tress removed by customer.	Grading , levelling and removal of trees Shall be in bidders scope.
4	SECTION 5.6 - ENGINEERING DESIGN BASIS CIVIL, STRUCTURAL & ALLIED WORKS	1025 of 1897	1.1	Walls facing plant side should be blast proof.	the location of proposed control room is away from main plant. Hence, bidder proposes control room without any blast proof walls. In case it is required, kindly advice which side of building requires blast proof walls.	Plant facing wall of control room shall be blast proof as per ITB.
5	Special conditions of contract		(g)		Bidder assumes construction water and construction power as free issue by customer as per clause 2.8 Site Facilities. Kindly confirm.	As per NIT.
6	Special conditions of contract			7.0 Labor and Staff	Space for labor colony shall be provided by customer as free issue near plant premises.	As per NIT.

7	Special conditions of contract			7.0 Labor and Staff	Drinking water, service water and power for labour colony shall be free issue by customer in labour camp.	As per NIT.
8	Special conditions of contract		2.8	Site facilities	Space for site office, site store, open store, fabricaion yard, etc. shall be provided free issue by customer within plant premises.	As per NIT.
9					Existing pipe rack shall be used for to and fro utility transfer. Kindly confirm.	Bidder may use existing piperack after checking of adequacy of existing piperack/structure.
10					Cooling water shall be routed above ground from terminal point.	Cooling Water shall be underground / aboveground based on site conditions.

Sl No.	Clause No.	Clarification	OWNER'S / PMC REPLY
1.	Sl.No. 6.3.2, Page 8 of 14, Doc. No. PNMM/PC140/E-601/P-II/Sec.4.2	The material of construction of tubes for Generator Air Cooler shall be welded SS (SA249 TP304) (Being High finned tubes with Al fins). Other parts shall be of Carbon steel.	Material of construction for heat exchanger tubes, tube sheets, dome and fins shall be of Stainless steel (316) as per NIT
2.	Sl.No. 6.3.5, Page 8 of 14, Doc. No. PNMM/PC140/E-601/P-II/Sec.4.2	Cooler shall be designed and constructed in N + 1 (N Working and 1 Standby) configuration instead of 2x100% configuration as per BHEL standard practice.	Coolers shall be so designed & constructed in 2 x 100% configuration so that with one unit out of service for cleaning, the generator can deliver rated output continuously without exceeding the permissible temperature rise limit as per NIT
3.	Sl. No 1.5, Page 6 of 21, Doc No. PNMM/PC140/E-601/P-II/Sec. 2.0	We understand that Deaerator is not in bidder scope of supply. Pls confirm.	As per NIT ,Deareator not in Bidder's scope

**GENERAL:**

In the absence of detailed specification for the heat exchangers in our scope of supply, Design basis for the heat exchangers being offered is as indicated below.

**GT Package:****A. GT Oil Cooler**

- Design Code : TEMA 'C' & ASME Sec VIII Div I  
**Owner /PMC Reply : As per NIT "TEMA R"**
- Material of construction of tubes : Welded Stainless Steel (SA 249 TP 304)  
**Owner /PMC Reply : As per NIT**
- Material of construction of rest part : Common quality Carbon Steel  
**Owner /PMC Reply : As per NIT**
- Tube Dimension : 15.875/19.05 mm x 18 BWG (OD x Thk)  
**Owner /PMC Reply : Shall be finalized during detail engineering.**
- Orientation : Horizontal  
**Owner /PMC Reply : Shall be finalized during detail engineering.**

**B. GTG Air Cooler**

- Material of construction of tubes : High finned Stainless Steel (SA249 TP304) with Al fin.  
**Owner /PMC Reply : MOC of tubes shall be SS-316**
- Orientation : Side mounted Horizontal  
**Owner /PMC Reply : Shall be finalized during detail engineering.**
- Material of construction of rest part : Common quality Carbon Steel  
**Owner /PMC Reply : As per NIT**
- Tube Dimension : 16 mm x 1 mm (OD x Thk)  
**Owner /PMC Reply : Shall be finalized during detail engineering.**

NOTE: FOR TECHNICAL AMENDMENT PLEASE REFER PDIL/NFL WEBSITE.

S.No.	Document	Page No.	Clause No.	Specification Requirement	BIDDER COMMENTS	OWNER'S / PMC REPLY
NIT-FOR-GTG-HRSG-PROJECT-NFL-NANGAL-01-04-2017						
1.		285/1527	2.2	Meteorological data	We understand that maximum ambient temperature is 48 deg C and minimum ambient temperature as 1 deg C. Please confirm.  Please clarify coincident Relative Humidity(%) for maximum and minimum ambient temperature.	As per NIT
2.		285/1527 303/1527	2.2 4.0	Meteorological data  Atmospheric pressure	Clause 2.2 indicates site elevation above mean sea level as 347.9 meters which corresponds to atmospheric pressure of 973.1 mbar. Clause 4 indicates atmospheric pressure as 966.6 mbar. Please clarify which atmospheric pressure needs to be considered for performance guarantees.	As per NIT
3.		293/1527 297/1527	1.6 2.1	Fuel Gas Quality  Lean Gas	We understand that lean gas needs to be considered for performance guarantees. Please confirm.	As per NIT
4.		299/1527	3.1	Installation	We understand that gas turbine installation shall be outdoor. i.e., without any civil building/shed. Please confirm.	GTG Shall be under shed and EOT/Overhead Crane/Equivalent lifting Machines/Tools of Suitable Capacity for Carrying out future maintenance work of GTG shall be in Bidder's scope.
5.		299/1527 393/1527	3.1 5.7.3	Pulse filters  Air inlet filters	We understand that pulse-cleaning filters are to be supplied for inlet air system of gas turbine. Please confirm.	As per NIT
6.		300/1527	3.1	Inlet air chilling system	Please clarify whether downstream equipment of gas turbine such as generator, transformer, HRSG etc. needs to be sized considering inlet air	Provision to be provided for future installation.



					chilling. If yes, please clarify chiller outlet temperature to be considered for chiller sizing. Kindly consider chiller under evaluation and for meeting the qualification requirement of 20 MW (Net) power.	
7.		305/1527	4.4	NOx from stack	We propose to supply Non-DLN combustion system with water injection for the gas turbine which shall limit NOx emission at GT stack to 50 ppmvd@15% O2 and comply with CPCB norms. Please confirm.	As per NIT.
8.		306/1527	5	Fire fighting system	We propose to offer CO2 fire fighting system with 100% back-up cylinders as loose supply for the gas turbine. Please confirm.	As per NIT.
9.		314/1527	ee	GTG recommended maintenance schedule for 15 years	Please clarify whether Long Term Service Agreement (LTSA) for 15 years is required for the Gas turbine (Flange to Flange only)? Also, please clarify whether LTSA is also part of evaluation.	As per NIT.
10.		317/1527	3.0 (iii) 3.0 (xxvii)	Lube Oil purifier	Please clarify whether we need to offer fixed lube oil centrifuge or portable lube oil purifier.	As per NIT.
11.		318/1527	3.0 (xvi)	System-1	We understand that System-1/Condition monitoring system needs to be supplied for gas turbine. Please confirm.	As per NIT.
12.		320/1527  385/1527	5.0  2.4	EQUIPMENT QUALIFICATION CRITERIA	Kindly include the following paragraph to meet qualification criteria of DLN combustion system: "The GT manufacturer meeting the above qualification criteria with Standard Combustion System can also utilize the	As per NIT.

					past proven experience of DLN combustor system sourced from their licensor/technical collaborator (in the proposed GT model) for the purpose of qualification of the proposed GT model”	
13.		320/1527	6.1.3	Margins should be provided as an allowance for performance degradation due to fouling etc. during period of continuous operation	Please clarify the margin in terms of % Degradation to be considered?	Bidder to consider suitable margin against the degradation of Machine during period of continuous operation ensuring net minimum 20 MW power generation at site condition excluding internal power consumption all the time.
14.		320/1527 428/1527 447/1527	6.2 6.3	Starting system  Voltage level	We understand that Diesel engine needs to be supplied as starting system for the gas turbine. Please confirm.  If motor starting is required for gas turbine, the customer shall provide voltage level of 6.6 kV.	Only diesel engine shall be supplied as starting system for the gas turbine. Motor is not acceptable as starting system for the gas turbine.
15.		324/1527  395/1527	6.10  5.8.11	Enclosure ventilation  Ventilation system	Clause 6.10 and 5.8.11 (a) indicates positive ventilation system whereas Clause 5.8.11 (c) indicates negative ventilation system to be supplied for the gas turbine. Please clarify.	As per NIT
16.		392/1527	5.7.1	All metallic air path components shall be of Type 304 stainless steel	We propose to offer complete inlet air system along with ducting in carbon steel. Please confirm.	As per NIT

17.		430/1527 449/1527	4.3.3 6.16	DC System	Please clarify whether DC system required for gas turbine auxiliaries shall include 2x100% battery banks with 2x100% charger for each battery bank.	Yes. Two separate DC Power system, one for GTG Auxiliaries (to meet total DC requirement for 4 hours ) and other for switchgear control supply ( To meet total DC requirement for 2 hours) ,shall be provided, as per NIT.  Each DC System shall be dual type (100% redundancy)
18.		1176/1527	2.0	Operational spare parts	We understand that operational spare parts are not under evaluation and hence are optional to quote. Please confirm.	As per NIT
19.		1314/1527	2.6.3	GCV/NCV	Generally, performance guarantees shall be furnished on NCV basis and hence gas data during performance guarantee test will be considered on NCV basis only. Please confirm.  If not, kindly provide GCV for Lean, Average and Rich gas compositions.	Please refer Amendment of Sec-1.2 specifying the NCV to be considered for guaranteed NG Consumption.
20.		1316/1527	3.0	Works cost	Generally, performance guarantees shall be furnished on NCV basis and hence NCV of natural gas needs to be considered for evaluation/works cost. Please confirm.  If not, kindly provide GCV for Lean, Average and Rich gas compositions.	Please refer Amendment of Sec-1.2 specifying the NCV to be considered for guaranteed NG Consumption.
21.	General	-	-	Dampers	We shall offer electrically operated diverter damper & guillotine gate for operation of gas turbine in open cycle. Please confirm.	Noted
22	General	-	-	Cooling Water Temperature	Please furnish cooling water temperature at (maximum, minimum , 15 deg C & Design) ambient conditions.	As per NIT

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