



SI. No.	SECTION NO.	PDF PAGE NO.	CLAUSE NO.	SUBJECT	EXISTING CLAUSE	AMENDMENT	REMARKS
1	PNMM/PC140/E-601/P-I/Annx-1.2	Page 216/1527	Part-V	GCV of NG	GCV of Natural Gas	Work cost shall be based on NCV instead of GCV .Refer amendment to Schedule of Prices Annexure-1.2 Part V	Modified
2	PNMM/PC140/E-601/P-II/Section 4.3	Page 349/1527	3.1.3	Dry Run Condition of HRSG	HRSG shall also be designed for GTG full load when no steam is generated (dry run condition).The entire HRSG shall be constructed to form a gas tight envelope to prevent gas leakage.	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. However, The entire HRSG shall be constructed to form a gas tight envelope to prevent gas leakage. and 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. Safety feature to be provided for the case when no saturated steam is available to import steam superheater coil.	Modified
3	PNMM/PC140/E-601/P-II/Section 12	Page 1314/1527	2.6.2	Guarantee test	Bidder shall furnish following guarantee without any tolerance / deviation for both GTG/HRSG unit 1. Rated net power output of 20MW (excluding internal consumption of auxiliaries of GT-HRSG package) at 11 KV outgoing feeder (Trivector energy meter) at site condition of 46 °C and 81% RH. 2. Rated net HP superheated steam (Normal at 91 Kg/cm2g, 510 °C) output of 100 MTPH along with Superheating of 45 MTPH Saturated Steam (95 Kg/cm2g, 3060C to 91 Kg/cm2g, 510 °C) at Hook-up points with steam quality as per VGB Standard during capability test. 3. Noise level of 85 dba at 1 meter. 4. NOx level at full Design load and part load of GTG & HRSG in compliance with Central and State Pollution Control Board 5. Fuel Consumption in SM3/hr along with GCV for GTG/HRSG package generating net 20 MW power at site conditions and 65 MTPH (Normal at 91 Kg/cm2g, 510 °C) along with Superheating of 30 MTPH Saturated Steam (95 Kg/cm2g, 3060C to 91 Kg/cm2g, 510 °C).	2.6.2 Bidder shall furnish following guarantee without any tolerance / deviation for both GTG/HRSG unit 1. Rated net power output of 20MW (excluding internal consumption of auxiliaries of GT-HRSG package) at 11 KV outgoing feeder (Trivector energy meter) at site condition of 46 deg C and 81% RH. 2. Rated net HP superheated steam (Normal at 91 Kg/cm2g, 510 °C) output of 100 MTPH along with Superheating of 45 MTPH Saturated Steam (95 Kg/cm2g, 306 deg C to 91 Kg/cm2g, 510 deg C) at Hook-up points with steam quality as per VGB Standard during capability test. 3. Noise level of 85 db at 1 meter. 4. NOx level at full Design load and part load of GTG & HRSG in compliance with Central and State Pollution Control Board 5. Fuel Consumption ( in SM <sup>3</sup> /hr along with NCV) for GTG/HRSG package generating net 20 MW power at site conditions and 65 MTPH (Normal at 91 Kg/cm2g, 510 °C) along with Superheating of 30 MTPH Saturated Steam (95 Kg/cm2g, 306 deg C to 91 Kg/cm2g, 510 deg C). 6. HRSG flue gas stack temperatures will not be more than 140 deg C	Modified

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4	PNMM/PC140/E-601/P-II/Section 2	Page 301/1527	3.3	Spare Burner	The burner shall be dry Low NOx type. MCR shall be achieved considering one burner under cleaning / maintenance. HRSG shall be designed to achieve rated steam parameters (pressure & temperature) capacity without GTG in running condition.	The burner shall be dry Low NOx type. MCR shall be achieved considering one burner under cleaning / maintenance for each set of burners.HRSG shall be designed to achieve rated steam parameters (pressure & temperature) capacity without GTG in running condition.	Modified
5	PNMM/PC140/E-601/P-II/Section 2	Page 293/1527	1.6	Lean Gas NCV/GCV/Specific Gravity	NCV : 11907 Kcal/Kg	Density/Sp Gr : row deleted NCV : 32562 BTU/SM3 NCV : 8211 Kcal/Sm3	Modified
6	PNMM/PC140/E-601/P-II/Section 4.3	Page 355/1527	3.7.6	Insulation of Stack	Both the stacks shall be suitably refractory lined from inside.	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.However,the inner lining of the top 9 mtr of main stack should be of acid resistant material suitable to design exhaust temperature.	Modified
7	PNMM/PC140/E-601/P-II/Section 4.1	Page 318/1527	3.0 (viii)	Enclosure & Shed for GTG system	Acoustic enclosures for the Gas turbine, Load Gear Box and electric generator.	Acoustic enclosures for the Gas turbine, Load Gear Box and electric generator. Complete system excluding HRSG shall be inside shed with suitable capacity EOT crane/Overhead Crane/Equivalent Lifting Machine..	Modified
8	PNMM/PC140/E-601/P-II/Section 2	Page 302/1527	3.3	Boiler Blowdown	Boiler blow down shall be sent to existing ETP plant for further treatment.	Boiler blow down water shall be sent through pump to ETP after cooling to less than 50 deg.C .	Modified
9	PNMM/PC140/E-601/P-II/Section 2.0	Page 307/1527	7.0	Utilities	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 point).	Natural Gas, Instrument Air, Cooling water, BFW , LP steam , Superheated steam, Nitrogen etc.shall be provided with DCS indication of Pressure, Temperature & Flow measurements at GTG/HRSG Battery Limit (Hook-up point) by Bidder.	Modified
10	PNMM/PC140/E-601/P-II/Section 4.1	Page 320/1527	6.1.7	FAN design criteria.	Forced and induced draught fans shall follow relevent IS / ISO standards.	Forced and induced draught Fan shall be API compliant.	Modified

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11	PNMM/PC140/E-601/P-II/Section 5.4	Page 427/1527	Cl. No. 2.5(I) Design Philosophy- Electrical Sec.-5.4		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 b. LV Transformer: 25% is added to the Maximum Normal Running Load c. Switchboard: Switchboard bus bar current rating shall be equivalent to 150% of full load current of upstream transformer.	All the Transformers, Switchgears, MCCs, PCCs etc. shall have capacity for future requirements. The Margin shall be as follows: a. HV Transformer: 25% is added to the Maximum Normal Running Load b. LV Transformer: 30% is added to the Maximum Normal Running Load c. Switchboard: Switchboard bus bar current rating shall be equivalent to 150% of full load current of upstream transformer.	Modified
12	PNMM/PC140/E-601/P-II/Section 5.4	Page 451/1527	Cl. No. 7.1.2 Design Philosophy- Electrical Sec.-5.4		The minimum size of power cables shall be 16 sq. mm (Cu). All cables shall be of Cu conductor up to 16 sq.mm	The minimum size of power cables shall be 2.5 sq. mm (Cu). All cables shall be of Cu conductor up to 16 sq.mm	Modified
13	PNMM/PC140/E-601/P-II/Section 5.4	Page 591/1527	Cl. No. 4.1.7 Technical Specification- Induction Motor(TS-0810) Sec.-5.4		All motors shall be energy efficient type of efficiency class of 'IE2' as per IS 12615: 2011.	All motors shall be energy efficient type of efficiency class of 'IE3' as per IS 12615:2011.	Modified
14	PNMM/PC140/E-601/P-II/Section 9	Page 1176/1527	2.0 (F)	Spares philosophy	Bidder will procure spares worth Rs.8 Crores (Tentative) at declared itemized price list in the bid at the instruction of owner and this cost shall not be considered for evaluation. Quoted price of spares shall remain valid for twenty four months from date of commissioning and owner may subsequently procure the same.	The bidder shall also submit price of operational spares as mentioned in Section-9 of NIT. The rates offered by the party against this priced list shall remain valid for one year from the date of commissioning. (Refer Amendment to Section -9, Clause No. 2.2 F)	Modified
15	PNMM/PC140/E-601/P-II/Section 9	Page 1176/1527	2.0	Mandatory spares		<b>(Refer Amendment to Section -9 for Mandatory Spares, Clause No- 2.1 a &amp; 2.1 b)</b>  Bidder should quote price for each mandatory spares mentioned at 4.1 below. Spare parts to be procured along with equipment shall be finalized before price bid opening which shall be considered for evaluation.	Additional
16		Additional Point		Hazardous Area Classification		Hazardous Area Classification shall be zone 1, II A / IIB, T-3,	Additional

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17		Additional Point		MOV & Check Valve on steam line		MOVs with manual hand jack and proper isolation valve shall be provided at HRSG outlet superheated and saturaterd steam lines.	Additional
18	New (Refer Annexure - 1.26)	Additional Point		Confirmation letter regarding the suitability of site for installation of GTG-HRSG		Bidder to submit the letter regarding the suitability of site for installation of GTG-HRSG. Refer Annexure 1.26.	Additional
19	PNMM/PC140/E-601/P-Ii/Section 2.0	Page 291/1527	Clause 1.4	BFW quality	BFW supply temperature Minimum = 104 deg C	BFW supply temperature Minimum = 45 deg C	Modified
20	PNMM/PC140/E-601/P-Ii/Section 2.0	Page 301/1527	Clause 3.3	HRSG		Since Hot BFW is provided in place of DM water, the HRSG stack temperature will be on higher side. To take care of high HRSG stack Temperatures, Bidder shall be using DM water at ambient temperature to generate 4.5 Kg/cm2g(minimum) LP steam at hook up points for use in owner complex. The complete LP steam generation equipment and instrumentation control system etc. is in bidder scope. In addition Natural Gas fuel heating or any other schemes to achieve the stack temperature as mentioned above shall be provided by the bidder. For each scheme, bidder shall provide scheme details, representative diagrams and detailed calculations along with bid for owner review. Though performance guarantees are as specified in PNMM/PC140/E-601/P-II/Sec. 12.0 However complete HRSG to be designed for LP section compatible with HRSG HP steam generation capabilities of 100 MTPH for regular operation. The HRSG flue gas stack temperatures will not be permitted more than 140 deg C.	Additional
21	PNMM/PC140/E-601/P-Ii/Section 2.0	Page 293/1527	Clause 1.6	Fuel Gas quality	Rich gas composition for component IC5=-.025, iC6=.25	Rich gas composition for component IC5=0.25, iC6=0	Additional
22	PNMM/PC140/E-601/P-I/Sec 2.0	Page 291/1527	Clause 1.3	Steam System	LP Steam design temperature = 176 deg C	LP Steam design temperature = 340 deg C	Modified



	<p align="center"><b>NIT FOR GTG &amp; HRSG PROJECT NFL, NANGAL</b></p> <p align="center"><b>SPARE PARTS FOR NANGAL</b></p>	PNMM/PC-140/E-601/P-II/Sec.-9.0		
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**SECTION – 9.0**

**SPARE PARTS**

**FOR**

**NANGAL**

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**1.0 SPARES PARTS FOR START-UP & COMMISSIONING:**

LSTK contractor shall supply spares parts and consumables (except raw materials and utilities supplied by others) required during Pre-commissioning & Commissioning of the plants until the plant is handed over to the owner after Performance Test. However the cost of the commissioning spares required shall be listed item wise and total cost of the same shall be indicated in Annex 1.2 of the price schedule. The unused start-up & commissioning spares brought in to plant by contractor shall be the property of the owner.

**2.0 SPARE PARTS OTHER THAN START-UP & COMMISSIONING:**



This consists of all categories of spares required for satisfactory operation of GT-HRSG unit other than start-up & commissioning spares.

**2.1 MANDATORY SPARE PARTS:**

- a) Bidder should quote price for each mandatory spares mentioned at 4.1 below. Spare parts to be procured along with equipment shall be finalized before price bid opening which shall be considered for evaluation.
- b) Bidder shall specify against each of the item of Mandatory Spare Part List by giving remarks in Unpriced Technical Bid in any one out of following:
  - I. Quoted
  - II. Not Quoted/ Not Required (In case, the spare indicated in the Mandatory List is not applicable to the bidders quoted model)

**2.2 OPERATIONAL SPARE PARTS:**

- a) These spares shall be purely ware house spares.
- b) Bidder shall submit priced list of spares parts as per list of operational spares mentioned at 4.2 below for satisfactory operation of GT-HRSG units.
- c) If any of the spares required for offered machine for scheduled combustion inspection, hot gas path inspection or major overhaul which are not indicated in the list, bidder may include the same in the list with itemised price.
- d) If any of the spares (indicated in the list) is not required for offered machine bidder may indicate it against that item.
- e) Bidder to indicate the itemized price for each quoted spares in the list.

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f) The bidder shall also submit price of operational spares. The rates offered by the party against this price list shall remain valid for one year from the date of commissioning.

**3.0 SPECIAL TOOLS & TACKLES, IF ANY:**

Bidder shall quote lump sum price for special tools and tackles and the same shall be considered for evaluation.

**4.0 SPARE PARTS LIST OTHER THAN START-UP & COMMISSIONING**

**4.1 MANDATORY SPARE PARTS LIST**

LSTK Contractor shall supply mandatory spares parts with itemised price as per Point No. 2.1:

- I) MECHANICAL - MACHINERY
- II) MECHANICAL – STATIC
- III) ELECTRICAL
- IV) INSTRUMENTATION

REQUIREMENT IN NIT						
MANDATORY SPARE PARTS LIST						
Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
I)	<b>MECHANICAL - MACHINERY</b>					
1	<b>COMPRESSOR</b>					
1.1	Rotor seals complete with mounting devices (Springs, brackets, etc.) for compressor	Set	1 Set			
1.2	Set of Thrust Pads of the Thrust Bearing	Set	1 Set			



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**MANDATORY SPARE PARTS LIST**

Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
1.3	Set of Pads/shoes for Journal bearings/Cylindrical Bush Bearing as applicable	Set	1 Set			
1.4	Intercooler spares LIKE Gaskets, Seals, Orings, etc.	Set	1 Set			
1.5	Set of bearings, Seals & Couplings for each type of lube oil pumps, Oil Centrifuge and vapour extraction fan or any other pump in the package.	Set	1 Set			
1.6	Sealing compound one charge	Set	1 Set			
<b>2</b>	<b>GAS TURBINE</b>					
2.1	Consumables (Including set of seals,gaskets,O-Rings,sealing compound etc.) required during combustion inspection	Set	1 Set			
2.2	Fuel nozzles	Set	1 Set			
2.3	Flame Detectors	Set	1 Set			
2.4	Ignition system exciter	Set	1 Set			
2.5	Sealing kit for stop valve assembly and control valve	Set	1 Set			
2.6	Complete burner Assembly	Nos.	1 No.			
2.7	Coupling for Gas Turbine to Gear Box	Set	1 Set			
2.8	Coupling for Gear Box to Generator	Set	1 Set			





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**MANDATORY SPARE PARTS LIST**

Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
2.9	Set of bearings Radial and Thrust, for each shaft of the Gear Box	Set	1 Set			
2.10	End Seals for the Gas Turbine	Set	1 Set			
2.11	Bladder accumulators for lube oil system and control oil system	Set	1 Set			
<b>3</b>	<b>AIR INTAKE SYSTEM</b>					
3.1	Air intake system self-cleaning filter elements	Set	2 Sets			
<b>4</b>	<b>FILTERS</b>					
4.1	On-line lube oil filters	Set	4 Sets			
4.2	On-line control oil filters	Set	4 Sets			
<b>5</b>	<b>CENTRIFUGAL FANS (TO BE REPEATED FOR EACH TYPE, RATING, MAKE)</b>					
5.1	All Gaskets in one fan	Set	2 Sets			
5.2	All Fan Bearings with shaft sleeve and lock nut in one fan	Set	1 Set			
5.3	Labyrinth lip seal for Fan Plummer block	Set	1 Set			
5.4	Fan Shaft Seal	Set	1 Set			
<b>6</b>	<b>PUMPS (TO BE REPEATED FOR EACH TYPE, RATING, MAKE) (Detail list of all type of pumps to be furnished by bidder covering spare part- list as enumerated below with unit price of each item)</b>					
6.1	Bushes and wear rings for one pump	Set	1 Set			



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**MANDATORY SPARE PARTS LIST**

Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
6.2	Shaft, Shaft sleeves of one pump	Set	1 Set			
6.3	shaft seals	Set	2 Sets			
6.4	Gaskets of one pump	Set	2 Sets			
6.5	Glands and mechanical seals as applicable of one	Set	1 Set			
6.6	Complete set of bearings for one pump	Set	1 Set			
6.7	Coupling complete with all nuts, bolts, etc. for one	Set	1 Set			
Note: Definition of Set : Set refers to the total requirement of individual equipment of that system.						
<b>II)</b>	<b>MECHANICAL - STATIC</b>					
<b>1</b>	<b>HRSG AND ITS AUXILIARIES</b>					
1.1	Gaskets for all application ( including steam drum man-hole, steam safety valves, access door etc.	Set	2 Set			
1.2	Stud bolts and Nuts for Man ways of each rating & type	Nos.	10 % of each Type			
1.3	Bend 180 deg, <b>(if applicable)</b> , for each type for following application					
	1. Economizer	Nos.	5% or minimum 2 Nos. of each type			
	2. Super heater (both primary and secondary)	Nos.	5% or minimum 2 Nos. of each type			
	3. Pre-heater	Nos.	5% or minimum 2 Nos. of each type			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
	4. evaporator	Nos.	5% or minimum 2 Nos. of each type			
1.4	Tubes for each type for following application	Nos.				
	1. Economizer	Nos (full length from upper header to lower header)	5% or minimum 2 Nos. of Tube of each type			
	2. Super heater (both primary and secondary)		5% or minimum 2 Nos. of Tube of each type			
	3. Pre-heater		5% or minimum 2 Nos. of Tube of each type			
	4. evaporator		5% or minimum 2 Nos. of Tube of each type			
1.5	Spares for duct burners					
	1. Gun assembly	Set	1 Set			
	2. Burner block	Nos.	1 No. for each type of Burner			
	3. Muffle block	Nos.	1 No. for each type of Burner			
	4. Burner mounting gasket	Set	2 Sets			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
1.6	Refractory material of all type for HRSG	Qty	5% of total installed quantity			
<b>2</b>	<b>HEAT EXCHANGERS SHELL AND TUBE: (U TYPE INCLUDED)</b>					
2.1	Bolts for each size	Nos.	5% or minimum 2 Nos. of each type			
2.2	Gaskets for each type & rating	Set	2 Sets of each type and rating			
2.3	Tube Plug for each size	Nos.	2 Nos.			
<b>3</b>	<b>PRESSURE VESSELS</b>					
3.1	Gaskets for each type & rating	Set	2 Sets of each type and rating			
3.2	Bolts for each size	Nos.	5% or minimum 2 Nos. of each type			
3.3	Safety Valves, drum and safety valves for super heater for each size & rating	Nos.	1 No. for each type and rating			
3.4	For wall penetration of pipes (metallic)	Pieces	2 Pieces			
3.5	Blowdown Valves	Nos.	One of each type and size			
<b>4</b>	<b>DOSING PUMPS of each type</b>					
4.1	Plunger / Diaphragm (as applicable)	Set	2 Sets			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
4.2	Pump bearings	Set	1 Set			
4.3	“O” Rings / Gland packing	Set	2 Sets			
4.4	Ball valves	Set	1 Set			
4.5	Relief valves	Set	1 Set			
4.6	Packings, Oil and grease seals	Set	2 Sets			
4.7	Set of Drive internals (worm-gear, wheel, stroke	Set	1 Set			
<b>5</b>	<b>MOTORISED AGITATOR</b>					
5.1	Impeller / Propeller with shaft	Nos.	1 Nos.			
5.2	Bearings, Seals and Packings	Set	1 Set			
<b>6</b>	<b>Oil Centrifuge</b>					
6.1	Set of seal kit for oil centrifuge	Set	2 Sets			
6.2	Complete oil pump for centrifuge.	Nos.	1 Nos.			
6.3	Drive gear and shaft set for bowl spindle	Set	1 Nos.			
6.4	Bowl and spindle for centrifuge	Set	1 Set			
<b>III)</b>	<b>ELECTRICAL</b>					
<b>1.0</b>	<b>GENERATOR</b>					
1.1	Generator Bearing (DE & NDE Side)	Set	1 Set			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
1.2	Bearing Liner (DE & NDE Side)	Set	1 Set			
1.3	Brushes & brush holders for shaft earthing	Set	1 Set			
1.4	Current & Potential transformers (for Line & Neutral Cubicle)	Set	1 Set			
1.5	Surge Arrester	Set	1 Set			
1.6	Terminal block with bushing, insulators & jumpers	Nos.	1 No.			
1.7	CD of Ladder logic/ data base	Nos.	1 No.			
1.8	Control Transformers of each type	Nos.	1 No.			
1.9	Auxiliary transformers of each type	Nos.	1 No.			
1.10	Relays/contactors of each type	Nos.	1 No.			
1.11	Neutral point Cubicle Spares like CT, PT, Neutral Earthing Breaker etc	Nos.	1 No.			
<b>2.0</b>	<b>Excitation System</b>					



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
2.1	RC network for exciter Circuit over-voltage protection	Set	1 Set			
2.2	Printed circuit cards of each type	Nos.	1 No.			
2.3	Power diode (rotating) (brushless excitation system) complete set.	Set	1 Set			
2.4	Exciter / PMG Rotor (Brushless Excitation System) of each type	Nos.	1 No.			
2.5	Rectifier fuses of each type.	Nos.	3 Nos.			
2.6	Field circuit breaker	Nos.	1 No.			
2.7	Electronic card for each type	Nos.	1 No.			
2.8	Exciter Bearings	Set	1 Set			
<b>3.0</b>	<b>RELAY PANELS (NUMERICAL RELAY OF EACH TYPE &amp; RATING)</b>					
3.1	Protective relays of each type & Rating	Nos.	1 No.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
3.2	Trip relays of each type & Rating	Nos.	1 No.			
3.3	Auxiliary relays of each type & Rating	Nos.	1 No.			
3.4	Timer for each range & type. & Rating	Nos.	1 No.			
3.5	Set of 3 interposing PTs of each ratio	Nos.	1 No.			
3.6	Set of 3 - fuse bases and fuse carriers	Nos.	1 No.			
<b>4.0</b>	<b>GENERATOR CONTROL PANEL</b>					
4.1	MCBs/MCCBs of each type & rating	Nos.	1 No.			
4.2	Electronic card of each type	Nos.	1 No.			
4.3	Meter of each type (Energy meter, Ammeter, Volt meter, Pf meter if any)	Nos.	1 No.			
4.4	Semaphore Indicators	Nos.	1 No.			





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		Unit	Requirement			
4.5	Synchronising switch	Nos.	1 No.			
4.6	Control Transformers of each type & rating	Nos.	1 No.			
4.7	Push Buttons with Actuator element of each type & rating	Nos.	1 No.			
4.8	Cluster LED's of each type & rating	Nos.	1 No.			
4.9	MCB of each type & rating	Nos.	1 No.			
4.10	Annunciators of each type	Nos.	1 No.			
4.11	Synchroscope	Nos.	1 No.			
4.12	Synchrotech & Synchrocheck	Nos.	1 No.			
<b>5.0</b>	<b>11KV SWITCHGEAR</b>					
5.1	Closing & tripping coils set of each breaker type.	Nos.	1 No.			
5.2	Spring charging motor of each rating.	Nos.	2 Nos.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
5.3	Auxiliary switch assembly of each type	Set	1 No.			
5.4	Limit position switch of each type	Set	2 Nos.			
5.5	Local / remote selector switch	Nos.	1 No.			
5.6	Breaker control switch (TNC control switch)	Nos.	1 No.			
5.7	Protective Numerical relays of each type	Set	1 No.			
5.8	Trip relays of each type	Nos.	2 Nos.			
5.9	Auxiliary relays of each type	Nos.	2 Nos.			
5.10	Indicating lamp red, yellow, blue, green, amber of each type	Set	1 Set			
5.11	Fuses of different types & ratings					
	i) HRC HV for VT	Nos.	3 Nos.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
	ii) HRC LV	Nos.	3 Nos.			
5.12	Meters of each type (Energy meter, Ammeter, Volt meter, Pf meter if any)	Nos.	1 No.			
5.13	Transducers of each type	Nos.	1 No.			
5.14	Vacuum bottles of each type and each rating	Nos.	1 No.			
5.15	CT/ PT of each type	Nos.	1 No.			
<b>6.0</b>	<b>3.3 KV SWITCHGEAR</b>					
6.1	Closing & tripping coils set of each breaker type	Set	2 Sets			
6.2	Spring charging motor alone	Nos.	2 Nos.			
6.3	Auxiliary switch assembly	Set	2 Sets			
6.4	Limit position switch	Set	2 Sets			
6.5	Local/remote selector switch	Nos.	1 No.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
6.6	Breaker control switch	Nos.	1 No.			
6.7	Protective Numerical relays of each type	Nos.	1 No.			
6.8	Trip relays of each type	Nos.	2 Sets			
6.9	Auxiliary relays of each type	Nos.	2 Sets			
6.10	Indicating lamp of each type	Nos.	1 No.			
6.11	Fuses of different types & rating					
	i) HRC HV for VT	Nos.	3 Nos.			
	ii) HRC LV	Nos.	3 Nos.			
6.12	Meters of each type (Energy meter, Ammeter, Volt meter, Pf meter if any)	Nos.	1 No.			
6.13	Transducers of each type	Nos.	1 No.			
6.14	Vacuum bottles of each type and each rating	Nos.	1 No.			



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		Unit	Requirement			
<b>7.0</b>	<b>DC SYSTEM</b>					
<b>7.1</b>	<b>BATTERY (SPARES APPLICABLE SEPARATELY FOR EACH OF THE SUPPLIED BATTERIES)</b>					
a)	Battery Cell of each type	Nos.	2 Nos.			
b)	Vent Plugs	Nos.	20 % of each type			
<b>7.2</b>	<b>BATTERY CHARGERS</b>					
a)	Silicon Diodes of each type & rating IGBT of each type & rating	Set	1 Set			
b)	Control Switch & selector switches	Set	1 Set			
c)	Current Regulator	Nos.	1 Nos.			
d)	Off-Load Tap Changing Device	Set	1 Set			
e)	Fuse of each type and rating	Set	1 Set			
f)	Contactors of each type & ratings	Set	1 Set			
g)	SCRS of each type & rating	Set	1 Set			
h)	Chokes of each type & rating	Set	1 Set			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
i)	Capacitors of each type & rating	Set	1 Set			
j)	Auxiliary & Power contactors of each type & rating	Set	1 Set			
k)	Load Break Switches of each type & rating	Set	1 Set			
l)	Thermal overload relays of each type & rating	Set	1 Set			
m)	Resistor of each type & rating	Set	1 Set			
n)	Transistors of each type & rating	Set	1 Set			
o)	D.C. Ammeter	Set	1 Set			
p)	Miniature circuit Breaker of each type & rating	Set	1 Set			
q)	Indications lamps of each type	Set	1 Set			
r)	PCB's of each type	Set	1 Set			
s)	Under, over voltage and earth leakage protection devices	Nos.	1 No.			



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		Unit	Requirement			
<b>8.0</b>	<b>11KV/ 11.5KV – GENERATOR TRANSFORMER</b>					
8.1	Bushings ( HV & LV) of each type	Nos.	1 No.			
8.2	NCTs of each type	Nos.	1 No.			
8.3	Cooler fan & fan motor, if applicable	Nos.	1 No.			
8.4	Pressure relief device	Nos.	1 No.			
8.5	Bucchohz relay	Nos.	1 No.			
8.6	Valves of each type	Nos.	20 % of each type			
8.7	Oil level gauge	Nos.	1 No.			
8.8	Oil & Winding temp. Indicator	Set	1 Set			
8.9	Explosion vent diaphragm	Nos.	1 No.			
<b>9.0</b>	<b>11KV /3.3KV TRANSFORMERS</b>					
9.1	Bushings ( HV & LV ) of each type	Nos.	1 No.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
9.2	NCTs of each type	Nos.	1 No.			
9.3	Cooler fan & fan motor, if applicable	Nos.	1 No.			
9.4	Pressure relief device	Nos.	1 No.			
9.5	Buccholz relay	Nos.	1 No.			
9.6	Valves of each type	Nos.	20 % of each type			
9.7	Oil level gauge	Nos.	1 No.			
9.8	Oil & Winding temp. indicator	Set	1 Set			
<b>10.0</b>	<b>11KV /415V TRANSFORMERS</b>					
10.1	Bushings of each type	Nos.	1 No.			
10.2	NCTs of each type	Nos.	1 No.			
10.3	Cooler fan & fan motor, if applicable	Nos.	1 No.			
10.4	Pressure relief device	Nos.	1 No.			





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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
10.5	Buccholz relay	Nos.	1 No.			
10.6	Valves of each type	Nos.	20 % of each type			
10.7	Oil level gauge	Nos.	1 No.			
10.8	Oil & Winding temp. indicator	Set	1 Set			
<b>11.0</b>	<b>LOW VOLTAGE SWITCHGEAR (BREAKER TYPE)</b>					
11.1	Closing & tripping coils set of each breaker type	Set	2 Set			
11.2	Spring charging motor of each rating	Nos.	2 Nos.			
11.3	Fixed and moving contact assemblies of each breaker	Set	2 Set			
11.4	Bus bar support insulators of each type	Nos.	1 No.			
11.5	Auxiliary switch assembly	Set	2 Set			
11.6	Limit position switch	Set	2 Set			
11.7	Local/remote selector switch	Nos.	1 No.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
11.8	Breaker control switch	Nos.	1 No.			
11.9	Protective Numerical relays of each type	Nos.	1 No.			
11.10	Trip relays of each type	Nos.	2 Nos.			
11.11	Auxiliary relays of each type	Nos.	2 Nos.			
11.12	Indicating lamp red, yellow, blue, green, amber of each type	Set	1 Set			
11.13	Fuses of different types & ratings					
	i) HRC LV	Nos.	3 Nos.			
11.14	Meters of each type	Nos.	1 No.			
11.15	Transducers of each type	Nos.	1 No.			
11.16	MCB of each rating	Nos.	1 No.			
11.17	Secondary insulating contact block	Nos.	20 % of each type			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
11.18	Arcing contacts & arcing chutes	Set	1 Set			
11.19	CT & PT of each type	Nos.	1 No.			
11.20	Spare module of each type and rating	Nos.	1 No.			
<b>12.0</b>	<b>LOW VOLTAGE SWITCHGEAR (NON-BREAKER TYPE)</b>					
12.1	MCB / SFU of each type	Nos.	2 Nos.			
12.2	Aux switch assembly, limit position switches, Local/ Remote selector switch, breaker control switches & other switches	Nos.	2 Nos.			
12.3	Aux. Relays of each type used	Nos.	2 Nos.			
12.4	Clustered type LED of each type	Nos.	1 No.			
12.5	VTs of each ratio & type	Nos.	1 No.			
12.6	Fuses of each type & rating	Nos.	3 Nos.			
12.7	Transducers of each type & rating	Nos.	1 No.			
12.8	Thermal over Load Relay of each rating	Nos.	2 Nos.			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
12.9	Contactors of each type & rating	Nos.	2 Nos.			
12.10	Numerical relay of each type	Nos.	1 No.			
12.11	ELCB & RCBO of each type	Nos.	1 No.			
<b>13.0</b>	<b>HV MOTOR (FOR EACH RATING)</b>					
13.1	Bearings (Driving end)	Set	1 Set			
13.2	Bearings (Non driving end)	Set	1 Set			
13.3	Cooling fan of each type	Nos.	1 No.			
13.4	Space heater	Nos.	1 No.			
13.5	Terminal box	Nos.	1 No.			
13.6	Terminal stud with bushing & star links	Set	1 Set			
13.7	Grease nipple & Plug	Nos.	1 No.			
<b>14.0</b>	<b>CONTROL PANELS (FOR MISCELLANEOUS SYSTEMS)/ (FOR EACH RATING)</b>					
14.1	Air break switch	Nos.	1 No.			
14.2	Aux. relays, contactors of each type & rating	Nos.	1 No.			
14.3	Push Buttons of each type	Nos.	20 % of each type			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
14.4	Fuses for power and control circuit for all ratings	Nos.	20 % of each type			
14.5	Control switches	Nos.	1 No.			
<b>15.0</b>	<b>NEUTRAL EARTHING RESISTOR</b>					
15.1	Bushing with accessories of each type	Set.	1 Set			
15.2	Support Insulator of each type	Nos.	1 No.			
15.3	Resistor Element of each type	Nos.	1 No.			
<b>16.0</b>	<b>LIGHT FITTINGS OF EACH TYPE &amp; RATING</b>					
16.1	Fuses	Nos.	20 % of each type			
<b>17.0</b>	<b>FIRE DETECTION SYSTEM</b>					
17.1	Detectors of each type	Nos.	20 % of each type			
17.2	Loop card of each type	Nos.	1 No.			
17.3	Charger card	Nos.	1 No.			
17.4	Interface Units of each type	Nos.	1 No.			
17.5	Power supply unit of each type	Nos.	1 No.			
17.6	PCB of all types	Nos.	20 % of each type			



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Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
17.7	Manual Call Points	Nos.	1 No.			
17.8	Fuses	Nos.	20 % of each type			
17.9	Control relays of each type	Nos.	1 No.			
17.10	Audible hooter/buzzer	Nos.	1 No.			
<b>18.0</b>	<b>UNINTERRUPTED POWER SUPPLY</b>					
18.1	Ventilation Fan	Nos.	2 Nos.			
18.2	One of each type of PCBs	Nos.	1 No.			
18.3	One of each type of thyristors, diodes & transistors	Set	1 Set			
18.4	One of each type of capacitors, resistors & chokes	Set	1 Set			
18.5	Semiconductor fuses & HRC fuse links	Nos.	1 No.			
18.6	MCCBs & control switches of each type	Nos.	1 No.			
18.7	Signal Lamps of each type	Set	1 Set			
18.8	Battery cells of each type	Nos.	2 Nos.			
18.9	IGBT	Set	1 Set			



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		Unit	Requirement			
18.10	Isolator Switch	Nos.	1 No.			
18.11	MCB / MCCB & Control Switches	Nos.	1 No.			
<b>19.0</b>	<b>LV MOTOR (FOR EACH RATING)</b>					
19.1	Terminal Block	Set	1 Set			
19.2	Cooling Fan	Nos.	1 No.			
<b>20.0</b>	<b>PA SYSTEM</b>					
19.1	Printed Circuit Board of each type	Nos.	1 No.			
19.2	Fuses	Set	1 Set			
19.3	Power Supply Unit	Nos.	1 No.			
<b>21.0</b>	<b>CAPACITOR BANKS</b>					
21.1	Capacitor unit of each rating	Nos.	1 No.			
21.2	HRC Fuses (if used) with links of each rating	Nos.	1 No.			
21.3	Power Contactor of each rating	Nos.	1 No.			
21.4	PF controller card/unit of each type	Nos.	1 No.			



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		Unit	Requirement			
<b>22.0</b>	<b>LCS</b>					
22.1	Ammeters of different ranges	Nos.	1 No.			
22.2	OFF-ON Control switch	Nos.	1 No.			
22.3	Auto Manual/Local-Remote switch	Nos.	1 No.			
<b>23.0</b>	<b>ANNUNCIATOR PANEL</b>					
22.1	PCB card	Nos.	1 No.			
22.2	CPU	Nos.	1 No.			
22.3	SMPS	Nos.	1 No.			
22.4	Relays	Nos.	20 % of each type			
<b>24.0</b>	<b>LOAD MANAGEMENT SYSTEM</b>					
24.1	Digital input module	Nos.	1 No.			
24.2	Digital output module	Nos.	1 No.			
24.3	Analog input module	Nos.	1 No.			
24.4	Power supply module	Nos.	1 No.			
24.5	Remote I/O adaptor	Nos.	1 No.			
24.6	network interface module	Nos.	1 No.			





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		Unit	Requirement			
24.7	I/O chassis	Nos.	1 No.			
24.8	RIO / communication cable	Nos.	1 No.			
24.9	Battery for processor	Nos.	1 No.			
24.10	Fuses (assorted)	Nos.	20 % of each type			
24.11	Voltage transducers (each type)	Nos.	1 No.			
24.12	Current transducers	Nos.	1 No.			
<b>25.0</b>	<b>EOT CRANE</b>					
25.1	Complete set of contactor of each rating.	Nos.	1 No.			
25.2	Limit switches of each type	Nos.	1 No.			
25.3	Push button elements	Nos.	20 % of each type			
25.4	Push button actuators.	Nos.	20 % of each type			
25.5	Fuses of various ratings.	Nos.	20 % of each type			
25.6	Fuse fittings of various ratings	Nos.	20 % of each type			
25.7	Indicating lamp fittings	Nos.	20 % of each type			
25.8	Indicating lamps Over load relays of various ranges	Nos.	1 No.			



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		Unit	Requirement			
25.9	Brake coils	Set	1 Set			
25.10	Set of carbon brushes in case of S.R. motors	Nos.	1 No			
25.11	Set of resistors for S.R. motors	Nos.	1 No.			
25.12	Any special tools and tackles required for maintenance	Nos.	1 No.			
<b>IV)</b>	<b>INSTRUMENT ITEMS</b>					
<b>1</b>	<b>Field instruments</b>					
1.1	Pressure Gauges, Differential Pressure Gauge, Draft Gauges, Field Indicators, RTD/T/C with Thermowells, welded thermowell, Skin Thermocouple Sets, Speed Probes, Speed Transmitter, Sensors of Gas Detectors, Flame scanners, Hydrastep related accessories (display units, electrodes etc.), Magnetic flowmeter, Mass flowmeter, Radar type, Ultrasonic Flow transmitter, etc.	Nos.	1 no. of each type			
1.2	Transmitters for Flow, Pressure, Level, Temperature, Diff. Pressure application, Transmitter for LEL/GAS Detector System, etc.	Nos.	1 no. of each type			
1.3	Accessories such as Oval flange o-ring, 5 valve manifold, 2 valve manifold, isolation valve, drain plug, blind plugs.	Nos.	2 nos. of each type			
1.4	Displacer/Radar/Ultrasonic type Level Transmitters	Nos.	1 no. of each type.			
<b>2</b>	<b>Control Valve / SAPCV/Self Regulation, PRDS &amp; Desuperheating valves</b>					



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		Unit	Requirement			
2.1	Soft part / actuator spares, including actuator diaphragm and spring sets, for each type of actuator	Nos.	1 no. of each type			
2.2	Trim Set consisting of Seat ring/seal ring, Plug with stem, Cage(wherever applicable),Packing material for each make, type, size, pressure rating valve to be provided as spare	Nos.	1 no. of each type			
2.3	Gland Packing, O rings, Bonnet gasket, Seat gasket/ Line Gasket	Set	1 Set of each type			
2.4	SMART Positioner assembly (including Feedback Arrangement)Solenoid valves, Proximity switches / Limit Switches/ Position switches including enclosure with repair kit (seal kit) 1 set of each type	Nos.	2 nos. of each type			
2.5	Other accessories like Quick Exhaust relay, Volume Boosters, Air Filter regulators, Lockup relay, AOV (Pilot Valve), Position Transmitters, Change over relay ,NRV/Spare breathers/Silencers/Vent port filter required for all control Valve.	Nos.	2 nos. of each type			
2.6	Compression Fittings, Pipe Fitting	Nos.	10 nos. of each type of installed.			
2.7	Panel Mounted Instruments, Pushbuttons, Lamps, Selector switches, DPM etc. , including relevant terminal modules/accessories as a complete SET	Nos.	Minimum 1 nos. of each type.			
<b>3.</b>	<b>DCS / ESD/ Gas Monitoring system and other Control system</b>					
3.1	Central Processor cards, communication modules, network interface modules, System Power supply, Bulk	Set	1 set of each type			



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**REQUIREMENT IN NIT**

**MANDATORY SPARE PARTS LIST**

Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
	Power Supply and any other system hardware cards etc. excluding I/O modules					
3.2	System Pre-fab cables, other than I/O Card cables with all connectors, plugs, etc.	Set	1 set of each type			
3.3	Operator Station, View only station, Eng. Station, Server alongwith 24" LED type Colour Monitor with all type of cables/power chords	Nos.	1 No. of each type.			
3.4	Relays including relevant terminal modules/sockets, etc.	Nos.	5% or minimum 4 nos. of each type			
3.5	All type of System/PDB/Marshalling cabinet /console filters		100%. of each type			
3.6	All type of system/PDB/Marshalling cabinet/console including Fan assembly, Over heat Detection system, Fan failure detection unit including relevant terminal modules/pre-fab system cables, etc.	Nos.	5% or minimum 1 no. of each type			
3.7	I/O Cards including relevant terminal modules/pre-fab system cables, etc.	Nos.	5% of each type of card, subject to minimum of 2 nos. each			
3.8	All system Fuses, PDB fuses like HRC fuses and various glass fuses etc.	Nos.	20% for all fuses			
3.9	Isolation amplifier and IS Barriers, Repeaters, Power Rail/ Rail power supply module	Nos.	5% of each type of instruments, subject to minimum 2 nos. of each type			



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**REQUIREMENT IN NIT**

**MANDATORY SPARE PARTS LIST**

Sl. No.	EQUIPMENT	REQUIRED QUANTITY		Quoted	Not Quoted/ Not Required	Unit Price
		Unit	Requirement			
3.10	Special control system modules like Electronic Governor, I/H converters, over Speed Trip unit, Anti surge controller etc. for 1:1 replacement	Nos.	Minimum 1 nos. of each type			
3.11	Communication cables for DCS/ESD, RS-485, MODBUS	Meters	500 Meters of each type			
<b>4</b>	<b>Bentley Nevada 3500 Series Vibration Monitoring System Spares</b>					
4.1	Central Rack cards like Power supply card, Communication module, Vibration/Thrust Monitoring card, Vibration Probes, Probe Extension cable, Keyphasor module, TMR Relay module, Display unit, Vibration cable conduit, Proximeters, etc.	Nos.	Minimum 1 no. of each type			
<b>5.</b>	HVAC PLC and Analyser PLC modules 1)Communication cable- each type 2) Power supply unit 3) Processor Unit 4) IO cards	Nos.	Minimum 1 no.of each type			
<b>6</b>	<b>GAS Analyser Spares Applicable for all GAS analysers (including SOX/NOX, Dew point etc)</b>					
6.1	solenoid valve, communication board, Display unit, CPU module, Sensor electronics, Modulation unit, sample cell, Sensors, O ring, thermal fuse, heating cartridge, thermal trip, analog module etc.	Nos.	1 no. of each type			
<b>7.</b>	Special tool of each type	Nos.	Minimum 1 No.			

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**Note:**

1. The above spares do not include installed spares as well as commissioning spares. The above shall be purely ware house spares.
2. Wherever "Each Type" is specified, it means "of the Type/make/model/size and exactly replaceable"
3. Wherever "% qty." is specified, BIDDER to quote in next higher rounded figure

**4.2 OPERATIONAL SPARE PARTS LIST (TENTATIVE LIST)**

LSTK Contractor shall supply operational spares parts with itemised price as per Point No. 2.2:

- I) MECHANICAL - MACHINERY
- II) MECHANICAL – STATIC
- III) ELECTRICAL
- IV) INSTRUMENTATION
- V) PIPING

REQUIREMENT IN THE NIT						BIDDER		
SL. NO.	EQUIPMENT	REQUIRED QUANTITY (To be mentioned by the bidder)		INSTALLED QUANTITY (To be mentioned by the Bidder)		QUOTED	NOT QUOTED	UNIT PRICE
		Unit	Requirement	Unit	Installed Quantity			
I)	<b>MECHANICAL - MACHINERY</b>							
1.0	<b>COMPRESSOR</b>							
1.1	Set of inlet guide vanes of compressor along with Control mechanism for the	Set						



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SL. NO.	EQUIPMENT	REQUIRED QUANTITY (To be mentioned by the bidder)		INSTALLED QUANTITY (To be mentioned by the Bidder)		QUOTED	NOT QUOTED	UNIT PRICE
		Unit	Requirement	Unit	Installed Quantity			
	same							
1.2	Packing / gaskets for inlet guide vanes and control System of compressor	Set						
1.3	Rotor seals complete with mounting devices (Springs, brackets, etc.) for compressor	Set						
1.4	Complete set of gaskets for piping of cooling and sealing air system of gas turbine unit	Set						
1.5	Compressor/ Turbine Radial and Thrust Bearings	Set						
1.6	Set of Thrust Pads of the Thrust Bearing and set of shoes for Journal bearings	Set						
1.7	Complete coupling alongwith set of coupling bolts.	Set						
1.8	Set of Stationary Blade carrier	Set						
1.9	Set of O rings	Set						
1.10	Complete Gear Set along with shaft and shaft seals of Gear Box with Gear Box	Set						



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		Unit	Requirement	Unit	Installed Quantity			
	Spares like Set of Bearings, set of Wheels, etc.							
1.11	Intercooler spares as per spare part philosophy of Static	Set						
1.12	Inlet Guide Vanes	Set						
1.13	Stator Blades for Compressor	Set						
<b>2.0</b>	<b>GAS TURBINE</b>							
2.1	full set of air cooled nozzles of gas turbine including mounting / fixing accessories	Set						
2.2	Consumables during combustion inspection (Detail list to be furnished by bidder with unit price of each item)	Set						
2.3	Consumables during hot gas path inspection (Detail list to be furnished by bidder with unit price of each item)	Set						
2.4	Consumables during major overhaul (Detail list to be furnished by bidder with unit price of each item)	Set						





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		Unit	Requirement	Unit	Installed Quantity			
2.5	Nozzle caps	Set						
2.6	Cross Fire Tubes	Set						
2.7	Combustion liner	Set						
2.8	Transition piece	Set						
2.9	Fuel nozzles	Set						
2.10	Set of Nozzles for all stages of GTG	Set						
2.11	Set of Buckets for all stages of GTG	Set						



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		Unit	Requirement	Unit	Installed Quantity			
2.12	Flame Detectors	Set						
2.13	Ignition system exciter	Set						
2.14	Air atomising compressor spares internal assembly	Set						
2.15	Sealing kit for stop valve assembly and control valve	Set						
2.16	Diagonal swirler	Set						
2.17	Complete burner assembly	Set						
<b>3.0</b>	<b>GAS TURBINE AUXILIARIES</b>							
3.1	AC auxiliary lube oil pump set	No.						
3.2	DC emergency lube oil pump set (if applicable)	No.						
3.3	Turning gear device (if applicable)	Set						
3.4	Main lube oil pump (If applicable)	No.						



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		Unit	Requirement	Unit	Installed Quantity			
3.5	Control oil pump set	No.						
3.6	Set of Gaskets & Packings for Centrifuge (if applicable)	Set						
3.7	Set of seals and gaskets for diesel engine	Set						
3.8	Couplings and clutch between diesel engine and GTG rotor. If any.	Set						
3.9	Accumulator bladder with Sealing Kit	Set						
3.10	Set of Rotors, bearings & Coupling for Gear pump of Centrifuge, each Lube oil pumps (if applicable)	Set						
3.11	Centrifuge bowel spindle (if applicable)	No						
3.12	Drive mechanism for bowel spindle (if applicable)	Set						



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		Unit	Requirement	Unit	Installed Quantity			
3.13	Vapour extractor set If GTG has 2 x 100% vapour extractor	No.						
3.14	Mechanical Seal Complete for Oil Pumps – 1 Set	Set						
<b>4.0</b>	<b>AIR INTAKE SYSTEM</b>							
4.1	Air intake system self-cleaning filter elements	Set						
4.2	Air intake system replaceable filter elements	Set						
<b>5.0</b>	<b>FILTERS</b>							
5.1	On-line lube oil filters	Set						
5.2	On-line control oil filters	Set						
<b>6.0</b>	<b>HP/LP CHEMICAL DOSING SYSTEM (Following spares shall be supplied for each type of pump and agitator under each system)</b>							



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		Unit	Requirement	Unit	Installed Quantity			
	<b>HP DOSING PUMPS</b>							
6.1	Plunger / Diaphragm (as applicable)	Set						
6.2	Pump bearings	Set						
6.3	“O” Rings / Gland packing	Set						
6.4	Ball valves , suction and discharge valve.	Set						
6.5	Relief valves	Nos.						
6.6	Packings, Oil and grease seals	Set						
6.7	Set of Drive internals (worm-gear, wheel, stroke	Set						
6.8	Spare Motor	No						
6.9	Motor Bearings & Seals of each type	Set						



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		Unit	Requirement	Unit	Installed Quantity			
	<b>LP DOSING PUMPS</b>							
6.10	Plunger / Diaphragm (as applicable)	Set						
6.11	Pump bearings	Set						
6.12	"O" Rings / Gland packing	Set						
6.13	Ball valves	Set						
6.14	Relief valves	Nos.						
6.15	Packing, Oil and grease seals	Set						
6.16	Set of Drive internals (worm-gear, wheel, stroke	Set						
6.17	Spare Motor	Nos.						
6.18	Motor Bearings & Seals of each type	Set						
<b>7.0</b>	<b>MOTORISED AGITATOR</b>							



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SL. NO.	EQUIPMENT	REQUIRED QUANTITY (To be mentioned by the bidder)		INSTALLED QUANTITY (To be mentioned by the Bidder)		QUOTED	NOT QUOTED	UNIT PRICE
		Unit	Requirement	Unit	Installed Quantity			
7.1	Impeller / Propeller with shaft	Nos.						
7.2	Bearings, Seals and Packings	Set						
7.3	Spare Motor	Nos.						
7.4	Motor Bearings & Seals of each type	Set						
<b>8.0</b>	<b>CENTRIFUGAL FANS (TO BE REPEATED FOR EACH TYPE, RATING, MAKE)</b>							
8.1	All Gaskets in one fan	Set						
8.2	All Fan Bearings with shaft sleeve and lock nut in one fan	Set						
8.3	V- Belts in one fan (if applicable)	Set						
8.4	Rotor for Fan	Set						



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		Unit	Requirement	Unit	Installed Quantity			
8.5	Fan Plummer block Labyrinth lip seal	Set						
8.6	Fan Shaft Seal	Set						
9.0	<b>PUMPS (TO BE REPEATED FOR EACH TYPE , RATING, MAKE) (Detail list of all type of pumps to be furnished by bidder covering spare part- list as enumerated below with unit price of each item)</b>							
9.1	Impeller with its nuts and other associated parts of pump	Set						
9.2	Bushes and wear rings for one pump	Set						
9.3	Shaft, Shaft sleeves and shaft seals of one pump	Set						
9.4	Gaskets of one pump	Set						
9.5	Set of complete mech seal and set of faces and packings of the same.	Set						
9.6	Set of Bearings for one pump	Set						





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		Unit	Requirement	Unit	Installed Quantity			
9.7	Coupling complete with all nuts, bolts, etc. for one	Set						
9.8	Spare Motor	Nos.						
9.9	Motor Bearings & Seals	Set						
10.0	<b>In addition to above spares , following spares are also to be quoted by bidder :</b>							
10.1	01 No. Complete Spare Rotor assembly for Gas Turbine	Nos.						
10.2	01 No. Complete Rotor Assembly for Compressor	Nos.						
10.3	02 Complete sets of Bearings for Compressor	Sets						
10.4	02 Complete sets of Bearings for Gas Turbine	Sets						
10.5	01 set of Complete Spare Coupling (Turbine to Gear Box)	Sets						



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		Unit	Requirement	Unit	Installed Quantity			
10.6	01 set of Complete Spare Coupling (Gear Box to Generator)	Sets						
10.7	Radial and Thrust Bearing for each shaft of the Gear Box							
10.8	01 sets Rotor Seals/Glands/End Seals complete with mounting device for Gas Turbine	Sets						
10.9	01 set of Compressor Stator blades	Sets						
10.10	Radial and Thrust Bearing for each shaft of the Gear Box							
10.11	Tools and Tackles required for maintenance of GTG							
a	Boroscope	Set						
b	Laser Alignment Kit	Set						
c	Bolt Heating machine	Set						



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SL. NO.	EQUIPMENT	REQUIRED QUANTITY (To be mentioned by the bidder)		INSTALLED QUANTITY (To be mentioned by the Bidder)		QUOTED	NOT QUOTED	UNIT PRICE
		Unit	Requirement	Unit	Installed Quantity			
11.0	<b>OIL CENTRIFUGE :</b>							
11.1	Set of seal kit for oil centrifuge							
11.2	Complete oil pump for centrifuge.							
11.3	Drive gear and shaft set for bowl spindle							
11.4	Bowl and spindle for centrifuge							
• Note: Definition of Set: Set refers to the total requirement of individual equipment of that system.								
II)	<b>MECHANICAL - STATIC</b>							
1.0	<b>GAS TURBINE AND ACCESSORIES</b>							
1.1	<b>HRSG AND ITS AUXILIARIES</b>							
1.1.1	Gaskets for all application ( including steam drum man- hole, steam safety valves, access door etc.	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
1.1.2	Stud bolts and Nuts for Man ways of each rating & type	Nos.						
1.1.3	Bend 180 deg, <b>(if applicable)</b> , for each type for following application	Nos.						
	1. Economizer							
	2. Super heater (both primary and secondary)							
	3. Pre-heater							
	4. evaporator							
1.1.4	Tubes for each type for following application							
	1. Economizer	Nos full length (from upper header)						
	2. Super heater (both primary and secondary)							



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		Unit	Requirement	Unit	Installed Quantity			
	3. Pre-heater	to lower header)						
	4. evaporator							
1.1.5	Spares for duct burners (if applicable)	Nos.						
	1. Gun assembly							
	2. Burner block							
	3. Muffle block							
	4. Burner mounting gasket							
1.2	<b>Heat Exchangers Shell and Tube: (U Type included)</b>							
1.2.1	Bolts for each size	Nos.						
1.2.2	Gaskets for each type & rating	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
1.2.3	Tube Plug for each size	Nos.						
1.3	<b>Pressure Vessels</b>							
1.3.1	Gaskets for each type & rating	Nos.						
1.3.2	Bolts	Nos.						
1.3.3	Safety Valves, drum and safety valves for super heater along with 1 No. Spring for Safety Valves	Set						
1.3.4	Steam stop valve for pressure level for each size & rating	Set						
1.3.5	Expansion joints, fabric materials including fixturing elements	Set						
1.3.6	For wall penetration of pipes (metallic)	Pieces						
1.3.7	Expansion Joints for the Combustion Air ducts	Set						



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		Unit	Requirement	Unit	Installed Quantity			
1.3.8	Blowdown valves							
1.3.9	Refractory material for 2 years operational spares	Set						
1.3.10	Special Tools and Tackles required for maintenance	Set						
<b>III)</b>	<b>ELECTRICAL</b>							
<b>1.0</b>	<b>GENERATOR</b>							
1.1	Generator bearing (DE & NDE Side)	Set						
1.2	Bearing Liner (DE & NDE)	Set						
1.3	Brushes & brush holders for shaft earthing	Set						
1.4	Current & Potential transformers (for Line & Neutral Cubicle)	Set						



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		Unit	Requirement	Unit	Installed Quantity			
1.5	Surge Arrester	Set						
1.6	Rotor cooling fan	Nos.						
1.7	Rotor retaining ring	Nos.						
1.8	Rotor slot wedges	Nos.						
1.9	Stator slot wedges	Nos.						
1.10	Terminal block with bushing, insulators & jumpers	Nos.						
1.11	Cooler/heat exchanger	Nos.						
1.12	CD of Ladder logic/ data base	Nos.						
1.13	Control Transformers of each type	Nos.						
1.14	Auxiliary transformers of each type	Nos.						





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		Unit	Requirement	Unit	Installed Quantity			
1.15	Relays/contactors of each type	Nos.						
1.16	Neutral point Cubicle Spares like CT, PT, Neutral Earthing Breaker etc	Nos.						
<b>2.0</b>	<b>Excitation System</b>							
2.1	RC network for exciter Circuit over-voltage protection	Set						
2.2	Printed circuit cards of each type	Nos.						
2.3	Power diode (rotating) (brushless excitation system) complete set.	Set						
2.4	Exciter / PMG rotor (brushless excitation system) of each type	Nos.						
2.5	Rectifier fuses of each type.	Nos.						
2.6	Field circuit breaker	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
2.7	Electronic card for each type	Nos.						
2.8	Exciter bearings	Set						
<b>3.0</b>	<b>RELAY PANELS (NUMERICAL RELAY OF EACH TYPE &amp; RATING)</b>							
3.1	Protective relays of each type & Rating	Nos.						
3.2	Trip relays of each type & Rating	Nos.						
3.3	Auxiliary relays of each type & Rating	Nos.						
3.4	Timer for each range & type. & Rating	Nos.						
3.5	Set of 3- interposing CTs of each ratio	Nos.						
3.6	Set of 3 - interposing PTs of each ratio	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
3.7	Set of 3 - fuse bases and fuse carriers	Nos.						
<b>4.0</b>	<b>GENERATOR CONTROL PANEL</b>							
4.1 4	MCBs/MCCBs of each type & rating	Nos.						
4.2	Electronic card of each type	Nos.						
4.3	Meter of each type (Energy meter, Ammeter, Volt meter, Pf meter if any)					Nos.		
4.4	Semaphore Indicators	Nos.						
4.5	Synchronising switch	Nos.						
4.6	Control Transformers of each type & rating	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
4.7	Push Buttons with Actuator element of each type & rating	Nos.						
4.8	Cluster LED's of each type & rating	Nos.						
4.9	MCB of each type & rating	Nos.						
4.10	Annunciators of each type	Nos.						
4.11	Synchroscope	Nos.						
4.12	Synchrotech & Synchrocheck	Nos.						
<b>5.0</b>	<b>11KV SWITCHGEAR</b>							
5.1	Main Incomer Breakers and outgoing breakers of each rating & Type	Nos.						
5.2	Closing & tripping coils set of each breaker type.	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
5.3	Spring charging motor of each rating.	Nos.						
	Set of gaskets for all ratings & type	Set						
	Auxiliary switch assembly of each type	Set						
5.4	Limit position switch of each type	Set						
5.5	Local / remote selector switch	Nos.						
5.6	Breaker control switch (TNC control switch)	Nos.						
5.7	Protective Numerical relays of each type	Set						
5.8	Trip relays of each type	Nos.						
5.9	Auxiliary relays of each type	Nos.						
5.10	Indicating lamp red, yellow, blue, green, amber of each type	Set						



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		Unit	Requirement	Unit	Installed Quantity			
5.11	Fuses of different types & ratings							
5.12	i) HRC HV for VT	Nos.						
5.13	ii) HRC LV	Nos.						
5.14	Meters of each type (Energy meter, Ammeter, Volt meter, Pf meter if any)	Nos.						
5.15	Transducers of each type	Nos.						
5.16	Earthing Trolley	Nos.						
5.17	Bus bar support insulator of each type	Nos.						
5.18	Set of jaw contacts and cradle contacts of each rating	Set						
5.19	Vacuum bottles of each type and each rating	Nos.						
5.20	CT/PT of each type	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
5.21	Main horizontal bus bar	Nos.						
	Vertical dropper bus bar	Nos.						
	Bus bar mounted power fix contacts	Nos.						
5.22	Interpanel insulation barriers	Nos.						
5.23	Panel shutter assembly	Nos.						
5.24	Removable bus bar shrouds	Nos.						
5.25	Space heater along with thermostat	Nos.						
5.26	Surge arrestor	Nos.						
<b>6.0</b>	<b>3.3 KV SWITCHGEAR</b>							
6.1 6	Main incomer Breakers and outgoing breakers of each rating & Type	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
1								
6.2	Closing & tripping coils set of each breaker type	Set						
6.3	Spring charging motor alone	Nos.						
6.4	Set of gaskets of each type	Set						
6.5	Auxiliary switch assembly	Set						
6.6	Limit position switch	Set						
6.7	Local/remote selector switch	Nos.						
6.8	Breaker control switch	Nos.						
6.9	Protective Numerical relays of each type	Nos.						





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		Unit	Requirement	Unit	Installed Quantity			
6.10	Trip relays of each type	Nos.						
6.11	Auxiliary relays of each type	Nos.						
6.12	Indicating lamp of each type	Nos.						
6.13	Fuses of different types & rating							
6.14	i) HRC HV for VT	Nos.						
6.15	ii) HRC LV	Nos.						
6.16	Meters of each type (Energy meter, Ammeter, Volt meter, Pf meter if any)	Nos.						
6.17	Transducers of each type	Nos.						
6.18	Earthing Trolley	Nos.						
6.19	Set of jaw contacts and cradle contacts of each rating	Set						



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		Unit	Requirement	Unit	Installed Quantity			
6.20	Vacuum bottles of each type and each rating	Nos.						
6.21	CT/PT of each type	Nos.						
6.22	Main horizontal bus bar	Nos.						
6.23	Vertical dropper bus bar	Nos.						
6.24	Bus bar mounted power fix contacts	Nos.						
6.25	Inter panel insulation barriers	Nos.						
6.26	Panel shutter assembly	Nos.						
6.27	Removable bus bar shrouds	Nos.						
6.28	Space heater along with thermostat	Nos.						
6.29	Surge arrestor	Nos.						
<b>7.0</b>	<b>DC SYSTEM</b>							
<b>7.1</b>	<b>BATTERY (SPARES APPLICABLE SEPARATELY FOR EACH OF THE SUPPLIED BATTERIES)</b>							
a)	Battery Cell of each type	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
b)	Insulators Interconnector	Nos.						
c)	Connectors with Nuts & Bolts	Set						
d)	Vent Plugs	Nos.						
e)	P.V.C. Spill Trays	Set						
f)	Terminal Post	Set						
<b>7.2</b>	<b>BATTERY CHARGERS</b>							
a)	Silicon Diodes of each type & rating IGBT of each type & rating	Set						
b)	Control Switch & selector switches	Set						
c)	Current Regulator	Nos.						
d)	Off-Load Tap Changing Device	Set						
e)	Fuse of each type and rating	Set						
f)	Contactors of each type & ratings	Set						



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		Unit	Requirement	Unit	Installed Quantity			
g)	SCRS of each type & rating	Set						
h)	Chokes of each type & rating	Set						
i)	Capacitors of each type & rating	Set						
j)	Auxiliary & Power contactors of each type & rating	Set						
k)	Load break switches of each type & rating	Set						
l)	Thermal overload relays of each type & rating	Set						
m)	Resistor of each type & rating	Set						
n)	Transistors of each type & rating	Set						
o)	D.C. Ammeter	Set						
p)	Miniature circuit Breaker of each type & rating	Set						



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		Unit	Requirement	Unit	Installed Quantity			
q)	Indications lamps of each type	Set						
r)	PCB's of each type	Set						
s)	Float indicator	Nos.						
t)	Thermometer	Nos.						
u)	Charger push button of each type	Nos.						
v)	Under, over voltage and earth leakage protection devices	Nos.						
<b>8.0</b>	<b>11KV/ 11.5KV – GENERATOR TRANSFORMER</b>							
8.1	Complete set of gaskets of each type	Set						
8.2	Bushings ( HV & LV) of each type	Nos.						
8.3	NCTs of each type	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
8.4	Cooler fan & fan motor, if applicable	Nos.						
8.5	Pressure relief device	Nos.						
8.6	Buccholz relay	Nos.						
8.7	Valves of each type	Nos.						
8.8	Silica gel breather of each type (Main tank tank & OLTC)	Nos.						
8.9	Oil level gauge	Nos.						
8.10	Oil & Winding temp. Indicator	Set						
8.11	Dial type thermometer	Nos.						
8.12	Explosion vent diaphragm	Nos.						
<b>9.0</b>	<b>11KV /3.3KV TRANSFORMERS</b>							



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		Unit	Requirement	Unit	Installed Quantity			
9.1 9.1	Complete set of gaskets of each type	Set						
9.2	Bushings ( HV & LV ) of each type	Nos.						
9.3	NCTs of each type	Nos.						
9.4	Cooler fan & fan motor, if applicable	Nos.						
9.5	Pressure relief device	Nos.						
9.6	Bucholz relay	Nos.						
9.7	Valves of each type	Nos.						
9.8	Silica gel breather	Nos.						
9.9	Explosion vent diaphragm	Nos.						
9.10	Oil level gauge	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
9.11	Oil & Winding temp. indicator	Set						
9.12	Dial type thermometer	Nos.						
<b>10.0</b>	<b>11KV /415V TRANSFORMERS</b>							
10.1 0 1	Complete set of gaskets of each type	Set						
10.2	Bushings of each type	Nos.						
10.3	NCTs of each type	Nos.						
10.4	Cooler fan & fan motor, if applicable	Nos.						
10.5	Pressure relief device	Nos.						
10.6	Buccholz relay	Nos.						





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		Unit	Requirement	Unit	Installed Quantity			
10.7	Valves of each type	Nos.						
10.8	Silica gel breather	Nos.						
10.9	Oil level gauge	Nos.						
10.10	Oil & Winding temp. indicator	Set						
10.11	Dial type thermometer	Nos.						
<b>11.0</b>	<b>LOW VOLTAGE SWITCHGEAR (BREAKER TYPE)</b>							
11.1	Main incomer Breakers and outgoing breakers of each type and Rating	Nos.						
11.2	Closing & tripping coils set of each breaker type	Set						
11.3	Spring charging motor of each rating	Nos.						
11.4	Fixed and moving contact assemblies of each breaker	Set						



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		Unit	Requirement	Unit	Installed Quantity			
11.5	Set of gaskets for all ratings	Set						
11.6	Bus bar support insulators of each type	Nos.						
11.7	Auxiliary switch assembly	Set						
11.8	Limit position switch	Set						
11.9	Local/remote selector switch	Nos.						
11.10	Breaker control switch	Nos.						
11.11	Protective Numerical relays of each type	Nos.						
11.12	Trip relays of each type	Nos.						
11.13	Auxiliary relays of each type	Nos.						
11.14	Indicating lamp red, yellow, blue, green, amber of each type	Set						



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		Unit	Requirement	Unit	Installed Quantity			
11.15	Fuses of different types & ratings							
	i) HRC LV	Nos.						
11.16	Meters of each type	Nos.						
11.17	Transducers of each type	Nos.						
11.18	MCB of each rating	Nos.						
11.19	Secondary insulating contact block	Nos.						
11.20	Arcing contacts & arcing chutes	Nos.						
11.21	Space heater along with thermostat	Nos.						
11.22	Push button element & actuators	Nos.						
11.23	CT & PT of each type	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
11.24	Maintenance trolley for ACB	Nos.						
11.25	Main horizontal bus bar	Nos.						
11.26	Vertical busbar	Nos.						
11.27	Panel shutter assembly	Nos.						
11.28	Removable bus bar shrouds	Nos.						
11.29	Spare module of each type and rating	Nos.						
<b>12.0</b>	<b>LOW VOLTAGE SWITCHGEAR (NON-BREAKER TYPE)</b>							
12.1	MCB / SFU of each type	Nos.						
12.2	Set of gasket of each type	Set						
12.3	Bus bar support insulators of each type	Nos.						
12.4	Aux switch assembly, limit position switches, Local/ Remote selector switch, breaker control switches & other switches	Nos.						
12.5	Aux Relays of each type used	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
12.6	Clustered type LED of each type	Nos.						
12.7	CTs. of each ratio & type	Nos.						
12.8	VTs. of each ratio & type	Nos.						
12.9	Meters. Of each type & rating.	Nos.						
12.10	Fuses of each type & rating	Nos.						
12.11	Transducers of each type & rating	Nos.						
12.12	Thermal over Load Relay of each rating	Nos.						
12.13	Contactors of each type & rating	Nos.						
12.14	Numerical relay of each type	Nos.						
12.15	ELCB & RCBO of each type	Nos.						
<b>13.0</b>	<b>HV MOTOR (FOR EACH RATING)</b>							
13.1	Bearings (Driving end)	Set						



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		Unit	Requirement	Unit	Installed Quantity			
13.2	Bearings (Non driving end)	Set						
13.3	Cooling fan of each type	Nos.						
13.4	Space heater	Nos.						
13.5	Terminal box	Nos.						
13.6	Terminal stud with bushing & star links	Set						
13.7	Grease nipple & Plug	Nos.						
13.8	Complete wound stator of each rating	Nos.						
13.9	DE & NDE side end shield complete with bearing housing only for HT motors having roller/ball bearings	Nos.						
13.10	Set of sleeve bearings (both ends) complete with oil splasher ring & labyrinth without housing if applicable	Nos.						
<b>14.0</b>	<b>CONTROL PANELS (FOR MISCELLANEOUS SYSTEMS)/ (FOR EACH RATING)</b>							
14.1	Air break switch	Nos.						
14.2	Aux. relays, contactors of each type & rating	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
14.3	Clustered type LEDs of different colours	Nos.						
14.4	Push Buttons of each type	Nos.						
14.5	Fuses for power and control circuit for all ratings	Nos.						
14.6	Control switches	Nos.						
14.7	Terminal Bushing of each type	Nos.						
<b>15.0</b>	<b>NEUTRAL EARTHING RESISTOR</b>							
15.1	Bushing with accessories of each type	Set.						
15.2	Support Insulator of each type	Nos.						
15.3	Resistor Element of each type	Nos.						
<b>16.0</b>	<b>LIGHT FITTINGS of each type &amp; rating</b>							
16.1	Switch, MCB & RCCB of each type	Nos.						
16.2	Fuses	Nos.						
16.3	Sockets	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
16.4	Plugs	Nos.						
16.5	Lighting fixture	Nos.						
16.6	LED lamps of each type	Nos.						
16.7	Ballasts	Nos.						
<b>17.0</b>	<b>FIRE DETECTION SYSTEM</b>							
17.1	Detectors of each type	Nos.						
17.2	Loop card of each type	Nos.						
17.3	Charger card	Nos.						
17.4	Interface Units of each type	Nos.						
17.5	Power supply unit of each type	Nos.						
17.6	PCB of all types	Nos.						
17.7	Manual Call Points	Nos.						
17.8	Fuses	Nos.						





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		Unit	Requirement	Unit	Installed Quantity			
17.9	Control relays of each type	Nos.						
17.10	Audible hooter/buzzer	Nos.						
<b>18.0</b>	<b>UNINTERRUPTED POWER SUPPLY</b>							
18.1	Ventilation Fan	Nos.						
18.2	One of each type of PCBs	Set						
18.3	One of each type of thyristors, diodes & transistors	Set						
18.4	One of each type of capacitors, resistors & chokes	Set						
18.5	Semiconductor fuses & HRC fuse links	Nos.						
18.6	MCCBs & control switches of each type	Nos.						
18.7	Signal Lamps of each type	Set						
18.8	Battery cells of each type	Set						
18.9	Electrolyte	Nos.						
18.10	IGBT	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
18.11	Isolator switch	Nos.						
18.12	MCB/MCCB & control Switches	Nos.						
<b>19.0</b>	<b>LV MOTOR (FOR EACH RATING)</b>							
19.1	Terminal Block	Set						
19.2	Cooling Fan	Nos.						
19.3	Grease Nipple and Plug	Nos.						
19.4	Fan Cover	Nos.						
19.5	DE & NDE side end covers of each type for motors above 30kW	Nos.						
<b>20.0</b>	<b>PA SYSTEM</b>							
20.1	Field station each type	Nos.						
20.2	Operator console	Nos.						
20.3	Loud speaker each type	Nos.						
20.4	Driver unit for loud speaker each type	Nos.						
20.5	Microphone unit of field station	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
20.6	Amplifier assembly	Nos.						
<b>21.0</b>	<b>CAPACITOR BANKS SPARES ARE TO BE MENTIONED</b>							
21.1	Capacitor unit of each rating	Nos.						
21.2	HRC Fuses (if used) with links of each rating	Nos.						
21.3	Power Contactor of each rating	Nos.						
21.4	PF controller card/unit of each type	Nos.						
21.5	Limit Switch for Capacitor Bank of each type	Nos.						
<b>22.0</b>	<b>LCS</b>							
22.1	Ammeters of different ranges	Nos.						
22.2	OFF-ON Control switch	Nos.						
22.3	Terminal blocks	Nos.						
22.4	Auto Manual/Local-Remote switch	Nos.						





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		Unit	Requirement	Unit	Installed Quantity			
<b>24.0</b>	<b>LOAD MANAGEMENT SYSTEM</b>							
24.1	Digital input module	Nos.						
24.2	Digital output module	Nos.						
24.3	Analog input module	Nos.						
24.4	Power supply module	Nos.						
24.5	Remote I/O adaptor	Nos.						
24.6	network interface module	Nos.						
24.7	I/O chassis	Nos.						
24.8	RIO / communication cable	Nos.						
24.9	Battery for processor	Nos.						
24.10	Fuses (assorted)	Nos.						
24.11	Voltage transducers (each type)	Nos.						
24.12	Current transducers	Nos.						
<b>25.0</b>	<b>EOT CRANE</b>							
25.1	Bearings of each type & no.	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
25.2	Contactora coil of various ratings	Nos.						
25.3	Complete set of contactora of each rating.	Nos.						
25.4	Moving & fixed contact blocks of contactora of each rating.	Nos.						
25.5	Limit switches of each type	Nos.						
25.6	Push button elements	Nos.						
25.7	Push button actuators.	Nos.						
25.8	Fuses of various ratings.	Nos.						
25.9	Fuse fittings of various ratings	Nos.						
25.10	Indicating lamp fittings	Nos.						
25.11	Indicating lamps Over load relays of various ranges	Nos.						
25.12	Brake coils	Nos.						
25.13	Set of carbon brushes in case of S.R. motors	Nos.						
25.14	Set of resistors for S.R. motors	Nos.						
25.15	Any special tools and tackles required for maintenance	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
<b>IV</b>	<b>INSTRUMENTATION</b>							
<b>1</b>	Field instruments							
1.1	Pressure Gauges, Differential Pressure Gauge, Draft Gauges, Field Indicators, RTD/T/C with Thermowells, welded thermowell, Skin Thermocouple Sets, Speed Probes, Vibration Probes, Speed Transmitter, Proximometers of diff. model, Sensors of Gas Detectors, Probe Extension cable, Flame scanners, Different types of JB, Vibration system, Vibration cable conduit, Hydrastep related accessories, Magnetic flowmeter, Mass flowmeter, RADAR type, Ultrasonic Level/Flow transmitter, etc.each item including all peripheral accessories	Nos						
1.2	Transmitters for Flow, Pressure, Level , Temperature, Diff. Pressure application, Transmitter for LEL/GAS Detector System, etc. (each type of instruments)	Nos						
1.3	Accessories such as Oval flange oring, 5 valve manifold, 2 valve manifold, isolation valve, drain plug, blind plugs	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
	etc.( each type of instruments)							
2	Displacer type Level Transmitters (instruments Head with Torque Tube Assembly and Transmitter)	Nos						
2.1	Radar type Level Transmitters complete instrument & Electronic module/Cards each item	Set						
2.2	Electronic Drum Level Indicator (Hydrastep) Electronic module/Cards/Probe each item	Set						
2.2a	Conductivity / pH (Transmitters transmitter and electrode of each type)	Set						
2.2b	Torque Rench	Nos						
3	<b>Control Valve / SAPCV/Self Regulation</b>							
3.1	Soft part / actuator spares, including actuator diaphragm and spring sets, for each type of actuator(minimum 1 no. of each type of Actuator repair kit/Piston Ring/Actuator Diaphragm)	Set						





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		Unit	Requirement	Unit	Installed Quantity			
3.2	Trim Set(each type Trim set consisting of Seat ring/seal ring. Plug with stem, Cage(wherever applicable), Packing material for each make, type, size, pressure rating valve to be provided)	Set						
3.3	Gland Packing, O rings, Bonnet gasket, Seat gasket/ Line Gasket	Set						
3.4	Greases and Grease guns	Set						
3.5	Solenoid valves	Nos						
3.6	Proximity switches/ Limit Switches/ Position switches including enclosure	Nos						
3.7	SMART Positioner Assembly (including Feedback Arrangement)	Nos						
3.8	Other accessories like Quick Exhaust relay, Volume Boosters, Air Filter regulators, Lockup relay, AOV (Pilot Valve), Position Transmitters, Change over relay ,NRV/Spare	Set						



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		Unit	Requirement	Unit	Installed Quantity			
	breathers/Silencers/Vent port filter required for all control Valve. each item							
3.9	Snubber, Syphon, Gauge saver each item	Nos						
3.10	Air Distribution Manifold ( for I.A distribution)	Nos						
3.11	Compression Fittings, Pipe Fitting (each type)	Nos						
3.12	Panel Mounted Instruments	No						
3.13	PRDS & De-superheater unit ( spare same as those of control valve)	Set						
4	DCS / ESD/ Gas Monitoring system							
4.1	Central Control Processor, Central Processor cards, etc. (Including redundant and non-redundant nodes both), Power supply, Communication modules (LIU/Media converter/Network switches/Patch Chord/Power supply adaptor, etc.) and any other system hardware cards.( each type of cards,	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
	comprising the complete node of each type)							
4.2	System Pre-fab cables, other than I/O Card cables(each type with all connectors, plugs)	Set						
4.3	Operator Station, View only station, Eng. Station, Server along with 24" LED type Color Monitor with all type of cables/power chords each type	Nos						
4.4	RAID HDD unit for each machine	Nos						
4.5	Various Keyboards/ mouse, OEP, Network Switches, Firewall, etc.each type	Nos						
4.6	Relays (each type of RELAYs, including relevant terminal modules/sockets, etc.)	Set						
4.7	Pushbuttons, Lamps, Selector switches, DPM each type (each type of card, including relevant terminal modules/accessories as a complete SET)	Set						
4.8	Microprocessor based Annunciator Unit(complete Unit)	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
4.9	All type of system/PDB/Marshalling cabinet /console filters( 100% )	Set						
4.10	All type of system/PDB/Marshalling cabinet/console including Fan assembly, Over heat Detection system, Fan failure detection unit (each type , including relevant terminal modules/pre-fab system cables, etc)	Set						
4.11	All type of system/PDB/Marshalling cabinet/console Tubelight /Complete Tubelight assembly(each type of card, including relevant terminal modules/pre-fab system cables, etc.)	Set						
4.12	All type of various PDBs Voltmeters	Nos						
4.13	I/O Cards(each type of card, including relevant terminal modules/pre-fab system cables, etc.)	Nos						
4.14	Various System Battery, Terminators	Set						
4.15	All system Fuses and various glass fuses	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
4.16	All PDB fuses, like HRC, GSA Fuses, etc.(each type)	Nos						
4.17	24 V DC Bulk Power Supply modules	Nos						
5	Isolation amplifier and IS Barriers/ Power Rail/ Rail power supply assembly	Nos						
6	Special control system modules like Electronic Governor, I/H converters, over Speed Trip unit, Anti surge controller etc.	Set						
7	Bentley Nevada 3500 Series Vibration Monitoring System Spares							
7.1	Central Rack cards like Power supply card, Vibration/Thrust Monitoring card, Keyphasor module, TMR Relay module, Display unit, Proximity Probes, Extension cables, Proximeters, Relay board, Conduits etc. each type	Nos						
7.2	Master Slave clock(each type of module & part including cable etc.)	Nos						
7.3	HVAC PLC and Analyser PLC modules 1)Communication cable- each type	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
	2) Power supply unit 3) Processor Unit 4) IO cards							
8	GAS Analyser Spares Applicable for all GAS analysers( including SOX/NOX etc)							
8.1	Sample flow meter	Nos						
8.2	By pass flow meter	Nos						
8.3	Solenoid valve	Nos						
8.4	Communication board	Nos						
8.5	Display unit(each type)	Nos						
8.6	CPU Board(each type)	Nos						
8.7	Sensor Electronics(each type)	Nos						
8.8	Modulation unit(each type)	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
8.9	Sample cell(each type)	Nos						
8.10	sensors(each type)	Nos						
8.11	O- ring (each type)	Set						
8.12	Thermal Fuses(each type)	Set						
8.13	Heating Cartridge(each type)	Set						
8.14	Thermal trip, thermostat(each type)	Set						
8.15	Analogue module(each type)	Set						
8.16	Filter membrane(Pack of 25) (each type)	Set						
8.17	Fuse(each type)	Set						
8.18	Any other module ( not covered above).	Set						



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		Unit	Requirement	Unit	Installed Quantity			
9	pH /Conductivity analyser- complete analyser with sensor, cables, transmitters etc. each type	Set						
10	Silica analyser spares (each type)							
10.1	Sensor board(each type)	Nos						
10.2	Sensor and Detector(each type)	Nos						
10.3	Rotameter(each type)	Nos						
10.4	Pressure control valve(each type)	Nos						
10.5	Fuses(each type)	Set						
10.6	Electronic card(each type)	Nos						
10.7	Other auxillary cards(each type)	Nos						
10.8	Probe(each type)	Nos						





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		Unit	Requirement	Unit	Installed Quantity			
10.9	Filters, O-ring, Gaskets (each type)	Set						
10.10	Consumable kit(each type)	Set						
10.11	Lamp(each type)	Nos						
11	DEW point analyser- complete analyser with sensor, cables, transmitters, etc each type	Set						
12	Sample conditioning system applicable for all analyser system							
12.1	Complete Sample kit for sample pumps inclusive of O-rings, Seal ring, Diaphragm	Set						
12.2	Solenoid valve for more than one stream applications	Nos						
12.3	Flow switch(each type)	Nos						
12.4	Vaporization system if required which includes vapouriser, thermostat, Electrical tracing cable and Heater(each type)	Set						



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		Unit	Requirement	Unit	Installed Quantity			
12.5	Cooling system if required, which includes one cooler, flow conditioning system (each type) (each type)	Set						
13	Pressure regulator for Calibration Gas Cylinders(each type)	Nos						
14	Flame Scanner(each type)	Nos						
15	Gas Detectors(each type)	Nos						
16	Power cables	Meter						
17	Signal cables/Low capacitance cable/Extension cable(each type)	Meter						
18	Communication cables for DCS/ESD, RS-485, MODBUS(each type)	Meter						
19	Loop Powered Indicators(each type)	Nos						
20	Tubing (SS) (each type)	Meter						
21	Junction Boxes with cable glands(each type)	Nos						



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		Unit	Requirement	Unit	Installed Quantity			
22	Tools	Set						
23	Engineering Tool kit(each type)	Set						
24	External Hard disk (2TB) USB powered along with Protective covers	Nos						
25	CD/DVD(50 Nos Each)	Nos						
26	<b>Safety Valves</b>							
26.1	Gasket for Safety Valves of each type and rating	Set						
26.2	Gasket, Disc/seat, Nozzle, spring,spindle and Guide (of each type and rating)	Set						
27	<b>Breather Valve</b>							
27.1	Seal kit (spare for each type and rating)	Set						
28	<b>Rupture Disc</b>							
28.1	Gaskets and Spare Discs (Each type and rating)	Set						



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		Unit	Requirement	Unit	Installed Quantity			
29	Vacuum Breaker							
29.1	Gasket, 'O' Ring, Diaphragm, Soft Good Kit for Pilot Valve (For pilot operated valve), Other Vendor Recommended Spares for each type	Set						
30	<b>MOV</b>							
30.1	Gland packing set, body bonnet gasket, stem (complete set), stem drive bush, other vendor recommended spares for each type	Set						
<b>V</b>	<b>PIPING</b>							
1	Pipes (CS) $\leq 1.5''$	Meter						
2	Pipes (CS/AS/SS) : 2''-6''	Meter						
3	Pipes (CS/AS/SS) $\geq 8''$	Meter						
4	Pipes (AS/SS) $\leq 1.5''$	Meter						



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		Unit	Requirement	Unit	Installed Quantity			
5	Fittings BW (CS/AS/SS), ALL ITEMS $\geq 2"$	Nos.						
6	Fittings SW (CS/AS/SS), ALL ITEMS $\leq 1.5"$	Nos.						
7	Flanges (CS/AS/SS), ALL TYPE $\leq 1.5"$	Nos.						
8	Flanges (CS/AS/SS), ALL TYPE 2"-8"	Nos.						
9	Flanges (CS/AS/SS), ALL TYPE $\geq 10"$	Nos.						
10	Valves CS, ALL TYPE $\leq 1.5"$	Nos.						
11	Valves CS, ALL TYPE : 2"-6"	Nos.						
12	Valves CS, ALL TYPE $\geq 8"$	Nos.						
13	Valves SS/AS, ALL TYPE $\leq 1.5"$	Nos.						
14	Valves SS/AS, ALL TYPE : 2"-6"	Nos.						



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		Unit	Requirement	Unit	Installed Quantity			
15	Valves SS/AS, ALL TYPE: $\geq 8''$	Nos.						
16	GASKET (SPW & RTJ), METALLIC, ALL TYPE $\leq 8''$	Nos.						
17	GASKET (SPW & RTJ), METALLIC, ALL TYPE $\geq 10''$	Nos.						
18	GASKET (SPW & RTJ), NON-METALLIC, ALL TYPE $< 3''$	Nos.						
19	GASKET (SPW & RTJ), NON-METALLIC, ALL TYPE : $4''-12''$	Nos.						
20	GASKET (SPW & RTJ), NON-METALLIC, ALL TYPE : $\geq 14''$	Nos.						
21	BOLTING STUD/2NUTS, CS UPTO $7/8''$	Nos.						
22	BOLTING STUD/2NUTS, AS/SS UPTO $> 1''$	Nos.						

**ANNEXURE -1.26**

**DECLARATION BY BIDDER**

After visiting Nangal site, We \_\_\_\_\_ (Name of the Bidder) hereby confirm that offered plot is technically suitable for GTG&HRSG Project installation with regard to at site underground foundations/piling, obstacles etc. The plot is part of old Ammonia Plant, the removal and disposal of Civil Superstructure, Pedestals, Flooring, Underground foundation & obstacles (if any)etc. including site clearing is on our scope. We have studied attached Drawing of site in NIT.

For and on behalf of \_\_\_\_\_

Stamp & Signature \_\_\_\_\_

Name \_\_\_\_\_

Designation \_\_\_\_\_

Date \_\_\_\_\_