SI. NO.	PARTICULARS	QUANTITY
	1.2 Disc	1 no.
	1.3 Body seat rings	4 nos. for each type, size and rating of valves
	1.4 Gland packings	4 nos. for each type, size and rating of valves
	1.5 Pressure seal ring	4 nos.
	1.6 Gasket	4 nos.
	II. Low Capacity PRDS System (CRH)	
	1. Steam pressure reducing valve	1 no.
	1.1 Stem	1 no.
	1.2 Disc	1 no.
	1.3 Body seat rings	4 nos. for each type/size
	1.4 Gland packings	4 nos. for each size, type & rating of valves
	1.5 Pressure seal ring	4 nos.
	1.6 Gaskets	2 nos.
1.20.00 A	**Valve trim set for all control valves supplied under this package (except for SH/RH spray, HCPRDS & LCPRDS CV for which spares are covered under separate clause)**	
	Valve trim (including cage, plug, stem, seat rings, guide bushings, gland packing, gaskets etc.)	1 set for each type, class, size of control valve. 5 Sets* each for gland packing and gaskets for all control valves.
	Note: 1 set means complete replacement for one valve	
1.20.00 B	**Valves (Manual valves, Motor operated valves, Plug valves and any other valves type except control valves as under 1.20.00 A) supplied under this SG package and is not covered under separate clause**	
	Valve Stem, Disc and Seat	1 Set for each size,class and type of valve
	Gland Packings, Gaskets	5 Sets* each for gland packing and gaskets for each size, type of valves.
	Pressure seal rings	5 sets * for each size, type of valves
	Actuator nut for Motor operated valve	2 sets* for each type, size and class of valve
	Needle Bearings/ Plain bearing of actuator nut	2 sets* for each type, size and class of valve
	Complete Manual valves upto 50 NB	10% of population of each type, size and class of valve
	Complete Motor Operated valves upto 50 NB	10% of population of each type, size and class of valve
	Complete Plug Valve	10% of each type, size and class of valve

SI. NO.	PARTICULARS	QUANTITY
	*Note: 1 set means complete replacement for one valve	
1.20.00 C	**Gear Box of Valves, Gates (Gear Box of valve actuator and valve of motor operated valve and Gear Box of manual valve, plug valve etc., Gear box of Gates)**	
	1. Complete Gear Box	1 no. of each type, size
	2. Bearings for Gear Box	2 sets* of each type, size of gear box.
	3. Gaskets for Gear Box	4 sets* of each type, size of gear box.
	4. Oil seal and any other applicable packings for gear box	4 sets* of each type, size of gear box.
	Note: 1 set means complete replacement for one valve	
1.21.00	**Auxiliary Boiler (NOT USED)**	
1.22.00	**FGD System**	
1.22.01	**Booster Fans (if applicable)**	
	1. Complete Fan rotor assembly (excluding fan body & Coupling) consisting of: - Rotor Hubs (drive & regulating end as applicable) - Main Bearing Assy(Complete) - Hydraulic Actuating Device/Hydraulic Cylinder with Rotating Oil Seal Assy - Fan Blades with fixation parts (fastener, seals, clamp, pins etc.) Note: Complete Rotor assy to be supplied in assembled condition on a fixture/ transport stand. (Fan blades to be supplied in loose condition)	1 set*
	2. Booster fan motor complete	1 no.
	3. Booster fan motor bearing	1 set*
	4. Main bearing assembly	
	4.1 Main bearing assembly (Complete assembled)	1 set*
	4.2 Bearings for main bearing assembly	2 sets*
	5. All internal Spares for blade bearing assembly (Excluding housing)	4 sets*
	6. Lube Oil / Hydraulic Oil system	
	6.1 Pump assembly (excluding motor)	2 nos. of each type
	6.2 Motor	1 no. of each type and rating
	6.3 Pressure regulator	4 nos.
	6.4 PRV	3 nos. of each type
	6.5 Oil Filter	

SI. NO.	PARTICULARS	QUANTITY
	6.5.1 Filter housing Assembly (with changeover lever)	1 no
	6.5.2 Filter Element	6 nos.
	6.6 Coupling between oil pump & motor	2 nos.
	6.7 Seals for pump	4 Nos.
	6.8 Lub Oil Cooler assembly (Complete)	1 set*
	6.9 NRV of lub oil system	1 no of each type
	7. Fan Blades with fixation parts (fastener, seals, clamp,pins etc.)	1 set*
	8. Coupling between Fan & Motor (Including Intermediate shaft/ distance Piece)	2 sets*
	9. Fan Blade Actuating Assembly	
	9.1 Hydraulic Actuating Device/Hydraulic Cylinder with rotating oil seal	2 sets*
	9.2 Regulating Linkage Assy	1 set*
	9.3 Seal Ring Kit (complete)	10 nos
	10. Flexible Oil Hoses	4 sets
1.22.02	**Not Used**	
1.22.03	**Absorber**	
	1. Liner Material	5% coverage of each material and thickness for one Unit/Absorber
	2. Absorber Spray/Oxidation nozzles	10% of each type
	3. Absorber Mist Eliminator Washing Nozzles	10% of each type
	4. Absorber Mist Eliminator	5% of each type
1.22.04	**Oxidation Air Compressor**	
	1. Impeller Assembly	1 no.
	2. Bearings	1 no. of each type
	3. Motor	1 no. of each type and rating
1.22.05	**Agitators** (For Absorber Oxidation Tank, Mill Separator Tank, Limestone Slurry Preparation Tank and any other tank provided with agitators)	
	1. Impeller Assembly	1 no. of each type
	2. Bearing Assembly	2 nos. of each type
	3. Motor*	1 no. of each type and rating
	4. Belt and Pulley (If applicable)	2 nos. of each type
	5. Gear Box Assembly (If Applicable) *	1 no. of each type
	6. Agitator shaft assembly	1 no. of each type and rating

SI. NO.	PARTICULARS	QUANTITY
	7. Shaft Seal (If applicable)	2 nos. of each type
	8. Complete Agitator Assembly	1 no. of each type
	*In case of Geared Motor/ Motor with integrated Gear where separate Gear Box is not applicable, twice the quantity specified for Motor to be supplied by the contractor.	
1.22.06	**Slurry Pumps** (Absorber Slurry Recirculation Pump, Gypsum Bleed Pumps, Mill Circuit Pump, Limestone Supply Pumps and any other slurry pumps)	
	1. Impeller Assembly	1 no. of each type
	2. Casing Liners (Where replaceable liners are applicable)	2 nos. of each type
	2A. Complete Casing (For the Absorber Slurry Recirculation/Gas Cooling Pump/Recycle Pump/All Slurry Pumps)	1 set* of each type and size
	3. Seals	3 sets* of each type
	4. Bearings	2 nos. of each type
	5. Motor	1 no. of each type and rating
	6. Motor-Pump Coupling	1 no. of each type
1.22.06 A	**VFD TRANSFORMER (If applicable)**	
	a) VFD Transformer, one of each type and rating	1 set*
	b) Primary Bushings with metal parts and gaskets (if applicable)	1 no. each rating
	c) Secondary Bushings with metal parts and gaskets	1 no. each rating
	d) Winding temperature indicator with alarm & trip contacts	1 no.
	e) Oil temperature indicator with alarm & trip contacts	1 no.
	f) Magnetic oil level gauge	1 no.
	g) Pressure relief device	1 no.
	h) Diaphragm for explosion vent	1 no.
	i) Buchholz relay/sudden pressure relay	1 no.
	j) Silca gel charge	1 no.
	k) Pressure gauge (applicable for sealed tank)	1 no. each type
1	Electronic cards	
	(a) Control modules	1 no. of each type & rating
	(b) I/O module	1 no. of each type & rating
	(c) Power supply modules	1 no. of each type & rating

SI. NO.	PARTICULARS	QUANTITY
	(d) Thyristor gate module including gate transformer	100% of one channel
	(e) Exciter module	1 no.
2	Thyristor bridge leg	1 no. (Qty. for one ph.)
3	Over voltage limiter and surge suppressor network	1 set *
4	Semi conductor fuses for thyristor	1 set*
5	Power & Control fuse	25% of installed quantity
6	Control Transformer	1 no. of each type & rating
7	Contactor/Breaker	1 no.
8	CT/VT	1 no. of each type & rating
9	Indicating lamps	100% of each type & rating
10	Auxiliary contactors & relays	1 no. of each type & rating
11	Panel mounted printer	1 no.
12	Indicating lamp holder full set	15% of each type and colour
13	Panel mounted meters	1 no. of each type & rating
14	Current Sensor	1 no. of each type & rating
15	Ground fault sensing card	1 no. of each type & rating
16	Fiber cable with connectors	1 set *
1.22.07	**Hydro-cyclones** (Mill, Gypsum Primary Dewatering, Secondary Waste Water and any other Hydrocyclone)	
	1. Hydro-cyclone Isolation Valve	10% of each type OR 1 no. whichever is higher
	2. Hydro-Cyclone	10% of each type OR 1 no. whichever is higher
	3. Hydro-Cyclone rubber lining	10% of each type OR 1 no. whichever is higher
1.22.08	**Feeders**	
	1. Belt	3 sets*
	2. Belt drive motor	1 no. of each type and rating
	3. Belt drive reducer	2 nos.
	4. Speed Reducer Assembly	1 set*
	5. Weighing Instruments	1 set*
	6. Feeder weighing roll	1 no.
	7. Gravimetric feeder gate actuator assembly	1 no.
	8. Counter assembly of feeder complete	1 no.

SI. NO.	PARTICULARS	QUANTITY
	9. Feeder head pulley assembly	1 no.
	10. Inlet span roller assembly	4 nos.
1.22.09	**Limestone Mills**	
	1. Mill Wear Parts (Liners) & Grinding element	1 set*
	Note : One set of Mill Wear Parts (Liners) above is defined as under :	
	1 Set = (Grinding elements needed for complete replacement of one mill) X (8000 x 1) / GWL, rounded off to nearest higher whole number. Where : GWL = Guaranteed wear life of Mill Wear Parts as offered by the bidder.	
	2. Mill Motor	1 no. of each type and rating
	3. Auxiliary Motor	1 no. of each type and rating
	4. Gear box internals (including Bearings and Seals)	2 sets*
	5. Complete Gear Box	1 set*
	6. Mill motor Bearings	1 set*
	7. Lube Oil / Grease System	
	7.1 Pump assembly	2 nos. of each type
	7.2 Motor	1 no. of each type and rating
	7.3 Pressure regulator	1 no. of each type
	7.4 Filters	2 nos. of each type
	7.5 Pump & Motor coupling	1 no. of each type
1.22.10	**Slurry Valves**	2 nos. of each type and size
1.22.11	**Slurry Line Bends**	2 nos. of each type and size
1.22.12	**Vacuum Belt Filter**	
	1. Filter Cloth	2 sets*
	2. Belt (if applicable)	1 set*

SI. NO.	PARTICULARS	QUANTITY
	3. Vacuum Box Seals	2 sets*
	4. Drive Motor (if applicable)	1 no.
1.22.12 A	**Vacuum Pump**	
	1. Pump Impeller Assembly	1 no
	2. Pump Bearing	1 set*
	3. Seals	1 set*
	4. Motor	1 no
1.22.13	**Vacuum Breaker Valves**	
	1. Valve Assembly	1 no.
	2. Actuator	1 no.
1.22.14	**Sump Pumps**	
	1. Complete Impeller Assembly	1 no. of each type
	2. Casing Liners	1 set* of each type
	3. Bearing	2 sets*
	4. Motor	1 no. of each type and rating
	5. Pump discharge valve assembly	1 no. of each type
1.22.15	**Horizontal Centrifugal Pumps**	
	1. Complete Impeller Assembly	1 no. of each type
	2. Casing Liners	1 set of each type
	3. Bearing	2 sets*
	4. Motor	1 no. of each type and rating
	5. Pump discharge valve assembly	1 no. of each type
1.23.00	**Goods cum passenger elevator for FGD (if applicable)**	
23.1	Over current relay	2 Nos. of each type and rating
23.2	Auxiliary relays	3 Nos. of each type
23.3	Friction block	2 Nos. of each type
23.4	Guide roller of each type	20% of total population or 3 nos. of each type whichever is high
23.5	Contactors of each type and rating	2 nos.
23.6	Control transformer	1 no. of each type and rating
23.7	Time device	2 nos. of each type and rating
23.8	Rectifiers	2 nos. of each type and rating
23.9	Resistor	3 nos. of each type and rating

SI. NO.	PARTICULARS	QUANTITY
23.10	Fuses of each rating	20 % of the total population
23.11	Limit switches of each type and rating	3 nos.
23.12	Push button	3 nos. of each type and rating
23.13	Contact device (if applicable)	3 nos. of each type and rating
23.14	Brake motor	2 nos. of each type and rating
23.15	Transmitters (if applicable)	2 nos. of each type and rating
23.16	Switches of each type and rating (if applicable)	3 nos.
23.17	Receiver	2 nos. of each type and rating
23.18	Bearings of each type & size	2 nos.
23.19	Roller of each type	3 nos.
23.20	Worm gear spares	
	a) 'O' rings	3 sets*
	b) Sealing ring of each type	3 sets*
23.21	Spares for brake	
	a) Fan	2 nos. of each type and rating
	b) Magnetic coil	3 nos. of each type and rating
	c) Brake disc	2 sets*
	d) Brake pad	2 sets*
23.22	Bushing (for door front)	2 sets*
23.23	Pinion	2 nos. of each type
23.24	Lift main Drive motor	1 no. of each type & rating
23.25	Door Operating Motor	1 no. of each type & rating
23.26	Landing Door complete	1 set. of each type & rating
23.27	Car Door Complete	1 set. of each type & rating
23.28	VFD drive	1 no. of each type
1.24.00	**Gates in Air and Flue gas path/ducts of boiler including FGD**	
	Seals	1 set of each type and size (Set means complete replacement for one gate)
	Actuator	1 no. of each type
1.25.00	**CC (BCW) pump motor assembly complete with cooler (if applicable)**	1 no. of each type and rating
2.00.00	**CONTROL AND INSTRUMENTATION** (APPLICABLE FOR STEAM GENERATOR AND AUXILIARIES INCLUDING FUEL OIL PRESSURISATION AND HEATING SYSTEM, DOZING System, ECW, FGD, De-NOx, Aux Boiler)	
2.01.00	**OTHER RELATED CONTROL AND INSTRUMENTATION SYSTEMS / EQUIPMENTS**	
	Other SG related sub-systems	
	1. Flame Monitoring System	
	1.1 Complete Flame Scanner Assembly including scanner head assembly, scanner housing, and fiber optic cables.	20 % or 4 nos., whichever is more

SI. NO.	PARTICULARS	QUANTITY
	1.2 Electronic cards including power supply modules for scanners	10 nos. of each type
	2. Coal Feeders	
	2.1 Motion monitor	2 nos.
	2.2 Speed pick-up	4 nos.
	2.3 Load Cell	4 nos.
	2.4 Electronic cards & Power Supply cards	2 nos. of each type
	2.5 Limit switch assembly for coal-on-belt, no coal flow, shear pin failure, etc.	4 nos. of each type
	2.6 Coupling (eddy current type etc., VFD as applicable)	2 nos.
	2.7 Relay/Contactor of each type make and model and rating	2 nos.
	3. Electromatic Safety Valves / Electromatic Ball valve Pressure switches and solenoid Valves.	2 nos. of each type
	4. Furnace Temperature Probes Thermocouple	2 nos.
	5. Acoustic Pyrometers (Not Used)	
	6. Furnace and Flame viewing system	LOT
	6.1 Flame Cameras	2 nos.
	6.2 Electronic Modules	2 nos. of each type
	6.3 Filter	40 nos. of each type
	7. Conductivity type level monitoring system (for drip legs)	
	7.1 Electrodes	10 nos.
	7.2 Electronic Cards	2 nos.
	7.3 Mounting chamber/Standpipe	1 no.
	8. Acoustic steam Leak Detection system (ASLD) (if applicable)	LOT
	(i) Processor and Interface modules	5 nos. of each type
	(ii) Sensors and Transceivers	5 nos.
	9. level monitoring system for Coal bunker, fly ash silo and ESP hopper (first field)	
	a) Acoustic 3D Level scanner	2 nos. of each type, make and model
	b) Local indicator	2 nos. per unit
	10. NOGS (Naturally Occurring Gamma Sensor) (If applicable)	2 nos. per unit
	11. Any other instruments (If applicable)	1 no. per unit
	12. Any other control system (If applicable)	1 no. per unit
2.02.00	**MEASURING INSTRUMENTS** (for all systems supplied under this chapter including Auxiliary Boiler, FOPH, Dosing System, ECW, Air compressor system, FGD, Skids)	
a)	Transmitters	
(i)	Transmitters of all type, range and model no. (For the measurement of Pressure, differential pressure flow, level, temperature etc.)	10%- of each type and model whichever is more

SI. NO.	PARTICULARS	QUANTITY
b)	Temperature elements	
(i)	RTD's	10% or 2 nos. of each type and length, whichever is more
(ii)	Thermocouples	10% or 2 nos. of each type and length, whichever is more
(iii)	Thermo well for above applications	10% or 2 nos. of each type and length, whichever is more
c)	Density meter	1 no. of each type and model
2.03.00	**PROCESS CONNECTION PIPING (FOR IMPULSE PIPING/TUBING, SAMPLING PIPING / TUBING AND AIR SUPPLY PIPING AS APPLICABLE**)	LOT
1.	Valves of all types and models	20 Nos. of each type and model
2.	2 way, 3way, 5way valve manifolds	10 Nos. of each type, class, size and model
3.	Fittings	100 Nos. of each type
4.	Purge meters	20 nos. of each type and model
5.	Filter regulators	20 nos. of each type and model
2.04.00	**INSTRUMENTATION CABLE, INTERNAL WIRING & ELECTRICAL FIELD**	
1.	Pre fabricated cable with connector of each type (other than DDCMIS application) (if applicable)	2 nos. of each type
2.	Other cables (Instrumentation and Control cable)	5% or 500 mtrs whichever is more for each type, pair and size of actual supplied quantity
2.05.01	**CONTROL VALVES, ACTUATORS & ACCESSORIES (FOR ALL SERVICES UNDER THIS CHAPTER)**	
1	Pneumatic and electro-hydraulic actuator assembly	1 no. of each type, model and rating
2	Diaphragms, O' rings, seals etc. of all types make etc.	5 nos.
3	Solenoid valves (if applicable)	1 no.
4	Positioner units /smart positioners (complete unit) & accessories (link assembly)	2 nos.
5	Pneumatic air-filter/Regulator of each type, make rating etc.	2 nos. of each type
6	Air lock relays	1 no. of each type, model and rating

SI. NO.	PARTICULARS	QUANTITY
7	Proportional valve , hydraulic solenoids, Pilot valves, Proportional valves, Position feedback transmitter (if applicable)	1 no of each type
8	Hydraulic actuators seals(set), Piston/Stem	1 no of each type
2.05.02	**PNEUMATICALLY OPERATED ISOLATION / BLOCK VALVES, ACTUATORS & ACCESSORIES (FOR ALL SERVICES UNDER THIS CHAPTER)**	
1.	Pneumatic actuator assembly	1 No. of each type, model and rating,
2.	Diaphragms, O' rings, seals etc. of all types make etc.	5 Nos.
3.	Limit switches (complete unit) & accessories (link assembly)	2 nos.
4.	Pneumatic air-filter/Regulator of each type, make rating etc.	2 nos.
2.06.00	**MICROPROCESSOR BASED / PLC BASED /ELECTRONIC BASED CONTROL PANEL (IF APPLICABLE)**	
1.	Fully programmed controllers and electronic module of each type (as applicable)	10% or 1 no. whichever is more
2.	Power supply Module (If applicable)	10% or 1 no. whichever is more
2.07.00	**FGD (SOx)**	
a	Analyzer for SOx, pH	1 no complete instrument of each type and model.
b	Electronic card assembly/ PCBs, moisture/condensate monitor, power supply modules	2 Nos. of each type
c	Set of gaskets/O-rings/ seals	4 Nos. of each type
d	Temp. Sensor	2 Nos. of each type
e	Heater assembly, Cooler assembly	2 Nos. of each type
f	Complete Probe with shield assembly (Not applicable for Insitu- path).	1 no. of each type and model
g	Solenoids	2 nos. of each type, model and rating
h	Filters, light source, sensor, detector, etc.	2 Nos. of each type
i	Calibration gases, Calibration cell and other consumables for calibration: - of all types and ranges	2 Nos. of cylinders of each type of calibration gas
j	Heavy duty blower assembly	1 no. of each type, size and rating.
k	Rota meter/Air flow meter	2 nos. of each type, model and rating
2.08.00	**Electrical Actuators**	

SI. NO.	PARTICULARS	QUANTITY
(i)	Electronic PCB of all types	10% of each type & model
(ii)	Absolute Encoder (Replaceable part)	5% of each type & model
(iii)	Electronic Torque sensor	5% of each type & model
(iv)	Electrical Actuator	1 no. of each type, class, size and model
(v)	Actuators gear box assembly of each type	5% or 1nos whichever max of each type and model
3.00.00	**Elevator**	
A	Goods Elevator	1 Lot (The lot price quoted will apply without any change to the applicable items only (In the list of items specified below) as applicable for the particular vendor finally selected during execution)
1	Friction block	2 of each type
2	Guide roller of each type	1 Lot comprising 20% of total population or 3 nos. of type whichever is higher
3	Contactors of each type and rating	2 Nos
4	Control transformer	1 No. of each type and rating
5	Time device	2 Nos. of each type and rating
6	Rectifiers	2 Nos. of each type and rating
7	Overcurrent relay	3 Nos. of each type and rating
8	Auxiliary relay	3 Nos. of each type and rating
9	Resistor	3 Nos. of each type and rating
10	Fuses of each rating	1 Lot comprising 20% of the total population
11	Limit switches of each type	3 Nos. of each type and rating
12	Push button	Complete set of replacement for one elevator
13	Contact device (if applicable)	3 Nos. of each type
14	Brake motor	3 Nos. of each type and rating
15	Transmitters	2 Nos. of each type and rating
16	Switches of each type and rating	3 Nos
17	Receiver	2 Nos. of each type and rating
18	Bearings of each type & size	2 Nos.
19	Roller of each type	3 Nos.
20	Worm gear spares	
a	'O' rings	3 Sets*
b	Sealing ring of each type	3 Sets*

SI. NO.	PARTICULARS	QUANTITY
21	Spares for brake	
a	Fan	2 Nos. of each type and rating
b	Magnetic coil	3 Nos. of each type and rating
c	Brake disc	2 Sets*
d	Brake pad	2 Sets*
22	Bushing (for door front)	2 Sets*
23	Pinion	2 Sets*
24	Lift Main drive motor	01 no of each type and rating
25	Door opening motor	01 no of each type and rating
26	Landing door complete	01 set*
27	Car door complete	01 set*
28	VFD drive	01 no of each type
B	Passenger Elevator	1 Lot (The lot price quoted will apply without any change to the applicable items only (In the list of items specified below)as applicable for the particular vendor finally selected during execution)
1	Friction block	2 Nos. of each type
2	Guide roller of each type	1 Lot comprising 20% of total population or 3 nos. of type whichever is higher
3	Contactors of each type	2 nos.
4	Control transformer	2 nos. of each type
5	Time device	2 nos. of each type
6	Rectifiers	2 nos. of each type
7	Overcurrent relay	3 nos. of each type
8	Auxiliary relay	3 nos. of each type
9	Resistor (if applicable)	3 nos. of each type
10	Fuses of each rating	1 Lot comprising 20% of the total population
11	Limit switches of each type	3 nos.
12	Push button	Complete set of replacement for one elevator
13	Contact device (if applicable)	3 nos. of each type
14	Brake motor	2 nos. of each type
15	Transmitters	2 nos. of each type
16	Switches of each type	3 nos.

SI. NO.	PARTICULARS	QUANTITY
17	Receiver	2 nos. of each type
18	Bearings of each type & size	2 nos.
19	Roller of each type	3 nos
20	Worm gear spares of each type	
a	'O' rings	4 Sets*
b	Sealing ring of each type	4 Sets*
21	Spares for brake for each type	
a	Fan	2 Nos.
b	Magnetic coil	3 Nos.
c	Brake disc	2 Sets*
d	Brake pad	2 Sets*
22	Bushing (for door front)	2 Sets* of each type
23	Pinion	2 nos. of each type
24	Lift Main drive motor	01 no. of each type
25	Door opening motor	01 no of each type
26	Landing door complete	01 no.
27	Car door complete	01 no.
28	VFD drive	01 no. of each type
	**One set means one complete replacement for a unit.	
	*One set means one complete replacement for an equipment.	
4.00.00	NOT USED	

5.01.00	**Electrostatic precipitator (ESP)**	
1	Support insulator	4 nos. Of each type & rating
2	Shaft insulator	6 Nos. of each type & rating
3	Emitting electrodes (as applicable for the specific design)	
	(a) Helical wire type	5% of the installed quantity in one ESP
	(b) Wire pipe in rigid frame	10% of the installed quantity in one ESP
	(c) Mast type	2 % of the installed quantity in one ESP
4	Collecting electrode	2% of the installed quantity in one ESP
5	Inner arm assembly	20 nos. each for collecting & emitting system.
6	Outer arm assembly	10 nos. each for collecting & emitting system.
7	Plain bearing	20 nos. of each type & size.
8	Shock bar/anvil	20 nos. of each type & size.
9	Shock Bar Guide	100 nos. of each type and size
10	Big Pin Wheel and Small pin wheel	10 nos. each type and size
11	Rappers (As applicable for the specific design)	
	(a) For electric rappers	
	(i) Assembled rapper/drop rods	20 nos. of each type & size.
	(ii) Coil assembly along with sleeve	4 nos.
	(iii) Casing	4 nos.
	(iv) Gaskets & packing	10 nos. of each type & size.

	(b) For tumbling rappers	
	(i) Hammers	20 nos. of each type & size.
	(ii) Bearing components	4 nos.
	(iii) Shafts	4 nos.
	(iv) Gear motors	4 nos. of each type & rating
10	Gaskets (One set means complete replacement for all TR sets, one ESP pass)	1 set*
11	Control system	
	(a) Push buttons for	
	(i) TR set controller	10 nos. Of each type & rating
	(ii) Others	5 nos. Of each type & rating
	(b) Indicator lamps	10 nos. Of each type & rating
	(i) Control fuse	10 nos. Of each type & rating
	(c) Power fuse	10 nos. Of each type & rating
	(d) Thyristor fuse	2 nos. Of each type & rating
	(e) Thyristor of transformer controller rectifier	4 nos. Of each type & rating
12	Ash level indicator for ESP	10 nos. Of each type & rating
13	Opacity monitor	2 Nos.
14	Power supply modules for remote control unit of opacity monitor	2 nos. Of each type, make & model.
15	Transformer rectifier set (Complete)	3 nos. of each type and rating
16	Control system	

	(a) Transformer-rectifier set controller	5 nos.
	(b) Rapper controller complete (if applicable)	2 Nos.
	(c) Communication controller complete (if applicable)	1 no.
	(d) Disconnecting Switch assembly	3 nos.
17	High Frequency/Mid Frequency Transformer Rectifier set (If applicable)	
	a) Complete HFTR/MFTR Set	3 nos.
	b) Gaskets for HFTR sets (One set means complete replacement for all TR sets, one ESP pass)	1 set*
	c) Control system	
	1.) High voltage unit	1 set*
	2.) Power electronic unit	1 set*
	3.) Board for power Electronic Controller Unit	1 no.
	4.) Cooling fans	1 no.
	5.) Measurement module for HV unit	1 no.
	6.) Fuses	1 set*
5.02.00	**Passenger Elevator for ESP Rapper Panel room on Roof (If applicable)**	
	1) Friction block	2 nos. of each type
	2) Guide roller of each type	20 of total population or 3 nos. whichever is higher
	3) Contactors	2 nos. of each type and rating
	4) Bushing (for door front)	2 sets* of each type
	5) Pinion	2 nos. of each type

	6) Worm gear spares of each type	
	7) 'O' rings	4 sets*
	8) Sealing ring of each type	4 sets*
	9) Time device/Timer card (as applicable)	2 nos. of each type and rating
	10) Rectifiers	2 nos. of each type and rating
	11) Resistor (if applicable)	3 nos. of each type and rating
	12) Fuses/MCB/Switches (as applicable)	2 nos. of each type & rating
	13) Limit switches	3 nos. of each type and rating
	14) Push button	Complete replacement of one elevator
	15) Contact device (if applicable)	3 nos. of each type and rating
	16) Brake motor/ magnet (as applicable)	01 no. of each type and rating
	17) Bearings	01 no. of each type & size
	18) Magnetic coil	03 nos.
	19) Floor indicator Display unit	01 no. of each type
	20) Over current relay	03 nos. of each type & size
	21) Control Transducers	01 no. of each type & size
	22) Roller	03 nos. of each type & size
	23) Brake Disk and Pad	01 no. of each type & size
	24) Lift Main drive motor	01 no. of each type
	25) Door opening motor	01 no. of each type

	26) Landing door complete	01 set*
	27) Car door complete	01 set*
	28) VFD drive	01 no. of each type
5.03.00	**Passenger Elevator for ESP Control Room**	
	1) Friction block	2 nos. of each type
	2) Guide roller of each type	20 of total population or 3 nos. whichever is higher
	3) Contactors	2 nos. of each type and rating
	4) Bushing (for door front)	2 sets* of each type
	5) Pinion	2 nos. of each type
	6) Worm gear spares of each type	
	7) 'O' rings	4 sets*
	8) Sealing ring of each type	4 sets*
	9) Time device/Timer card (as applicable)	2 nos. of each type and rating
	10) Rectifiers	2 nos. of each type and rating
	11) Resistor (if applicable)	3 nos. of each type and rating
	12) Fuses/MCB/Switches (as applicable)	2 nos. of each type & rating
	13) Limit switches	3 nos. of each type and rating
	14) Push button	Complete replacement of one elevator
	15) Contact device (if applicable)	3 nos. of each type and rating
	16) Brake motor/ magnet (as applicable)	01 no. of each type and rating

	17)	Bearings	01 nos. of each type & size
	18)	Magnetic coil	03 nos.
	19)	Floor indicator Display unit	01 no. of each type
	20)	Lift Main drive motor	03 nos. of each type & size
	21)	Door opening motor	01 no. of each type & size
	22)	Landing door complete	01 set*
	23)	Car door complete	01 set*
	24)	VFD drive	01 no of each type and rating

* One set means one complete replacement for an equipment

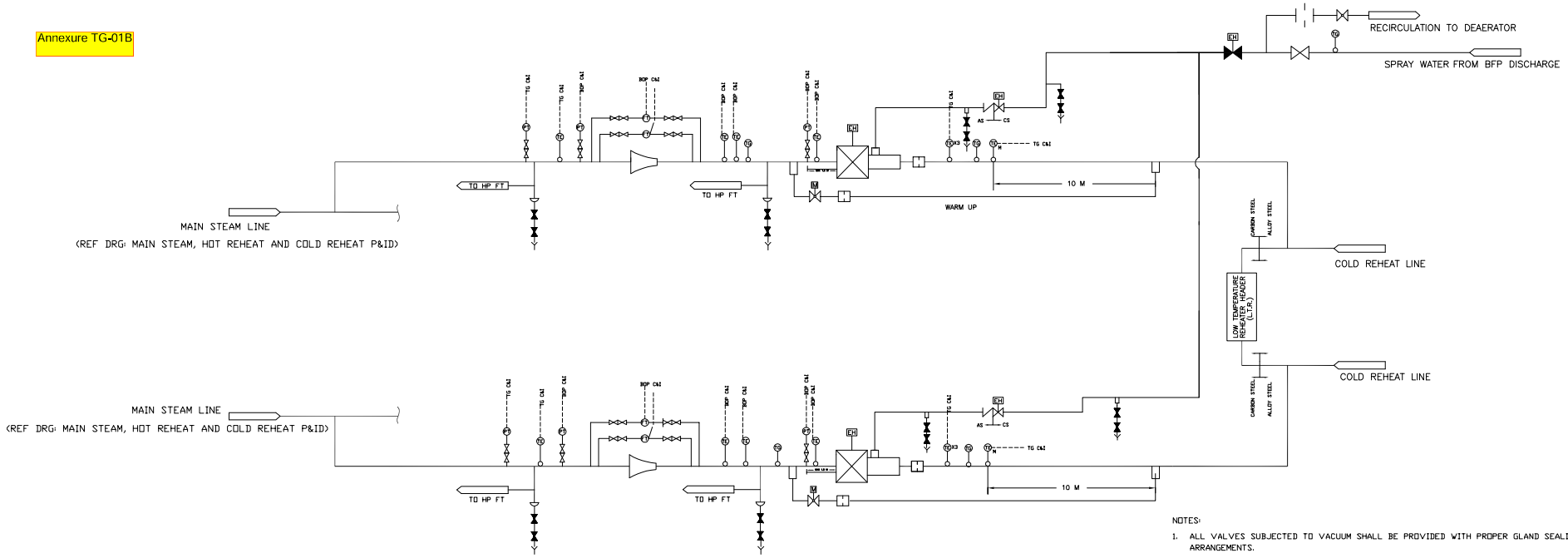
MANDATORY SPARES FOR CHIMNEY ELEVATOR
(Qty. indicated are for one (1) No. Chimney Elevator)

A.	BRAKE ASSEMBLY		Qty.
	1.	Brake Assembly complete	1 No.
B.	GEAR ASSEMBLY		
	2.	Gear Assembly complete	1 No.
C.	DOOR FRONT		
	3.	Bearing	3 Nos.
	4.	Roller	3 Nos.
	5.	Bushing (if applicable)	2 Nos.
D.	LIMIT CAMS		
	6.	Sensor	3 Nos.
	7.	Switch arm	3 Nos.
E.	CAB		
	8.	Guide roller	100% of the total ones installed each type or min. 1 no. whichever is higher
	9.	Switch	3 Nos.
F.	SLIDING DOOR		
	10.	Rollers (if applicable)	4 Nos. each type
G.	MACHINERY		
	11.	Guide roller	2 Nos.
	12.	Pinion	2 Nos.

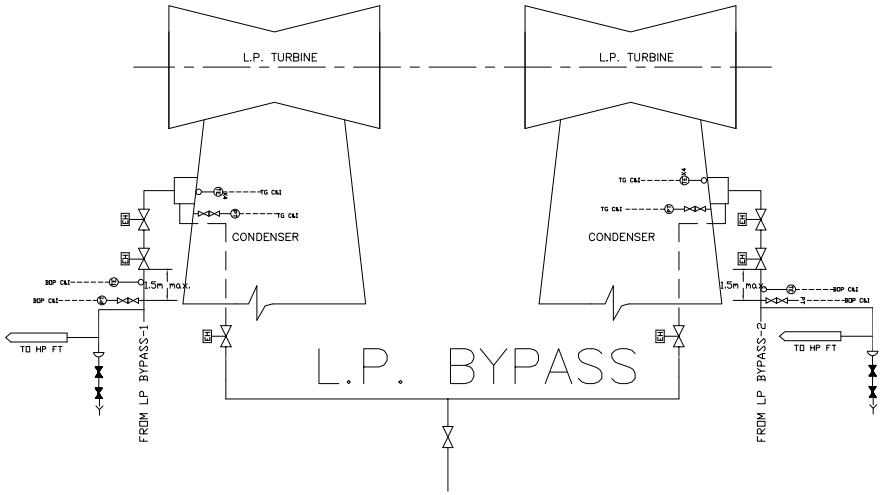
	13.	Rubber inserts (if applicable)	12 Nos.
	14.	Groove ring (if applicable)	6 Nos.
	15.	Brake motor	1 No.
H.		CABLE TROLLEY BEARING (if applicable)	
	16.	Bearing	3 Nos. of each type
I.		ELECTRICAL EQUIPMENTS	
	17.	Contactors	1 No. of each type
	18.	Auxiliary transformer	1 No.
	19.	Relays	1 No. of each type & rating
	20.	Switch	2 Nos. each type
	21.	Rectifier	3 Nos.
	22.	Limit switch	3 Nos. each type
	23.	Transmitter (if applicable)	1 No. if applicable
	24.	Receiver (if applicable)	1 No. if applicable
	25.	Battery charger	1 No.
	26.	Push Buttons	3 Nos. of each type
	27.	Timers	2 Nos. of each type & rating
	28.	Main drive motor with control system	1 Set

Wherever quantity has been specified as percentage (%), it shall mean percentage (%) of the total population of the item in the station (project), unless specified otherwise and the fraction will be rounded off to the next higher whole number.

Annexure TG-01B



H.P. BYPASS



NOTES:

1. ALL VALVES SUBJECTED TO VACUUM SHALL BE PROVIDED WITH PROPER GLAND SEALING ARRANGEMENTS.
2. BIDDER TO PROVIDE MINIMUM TWO NOS. OF LP BYPASS VALVES AND THE OUTLET OF EACH LP BYPASS VALVE SHALL BE CONNECTED TO EACH CONDENSER NOZZLE. IN CASE THE NO. OF LP BY PASS DUMP STEAM INLET NOZZLES ON CONDENSER IS MORE THAN 2, THE NO. OF LP BYPASS VALVES SHALL ALSO TO BE PROVIDED ACCORDINGLY SO AS TO AVOID INTER-CONNECTION/HEADER ARRANGEMENT AT LP BYPASS VALVE DOWN STREAM PIPING.
3. BIDDER TO PROVIDE SUITABLE WARMING ARRANGEMENTS FOR HP & LP BYPASS PIPINGS AND VALVES AS PER ITS STANDARD & PROVEN PRACTICE.
4. ALSO REFER DRG. : MAIN STEAM, HOT REHEAT AND COLD REHEAT P&ID
5. NOZZLE TYPE OF FLOW EEMENT IS SHOWN HERE, HOWEVER ,BIDDER MAY OFFER VENTURI TYPE OF FLOW ELEMENT BASED ON HIS STANDARD PRATICE OR AS PER THE RANGE OF REYNOLDS NO AS MENTIONED IN ISO-5167.
6. ALL THE INSTRUMENTS SHALL BE IN THE SCOPE OF BIDDER.THE MEASURING INSTRUMENTS INDICATED IN THE TENDER P&ID ARE MINIMUM THAT ARE REQUIRED TO BE PROVIDED BY THE BIDDER.IN CASE ADDITIONAL INSTRUMENTS ARE REQUIRED AS PER THE STANDARD & PROVEN PRACTICE OF BIDDER/SUB-VENDOR, THE SAME SHALL BE SUPPLIED WITHIN THIS CONTRACT.
7. SG-C&I, TG-C&I & BOP-C&I PART OF DDCMIS ARE IN CONTRACTORS SCOPE OF SUPPLY.
8. THE SIZE OF DRAIN LINES SHALL NOT BE LESS THAN 50 NB.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.			APPD.	DATE
B	RELEASED FOR TENDER	VCG	AS	PKD			AA	21.05.24
A	RELEASED FOR TENDER	AS	AS	PKD			AA	06/06/22
					M	C&I		
					CLEARED BY			

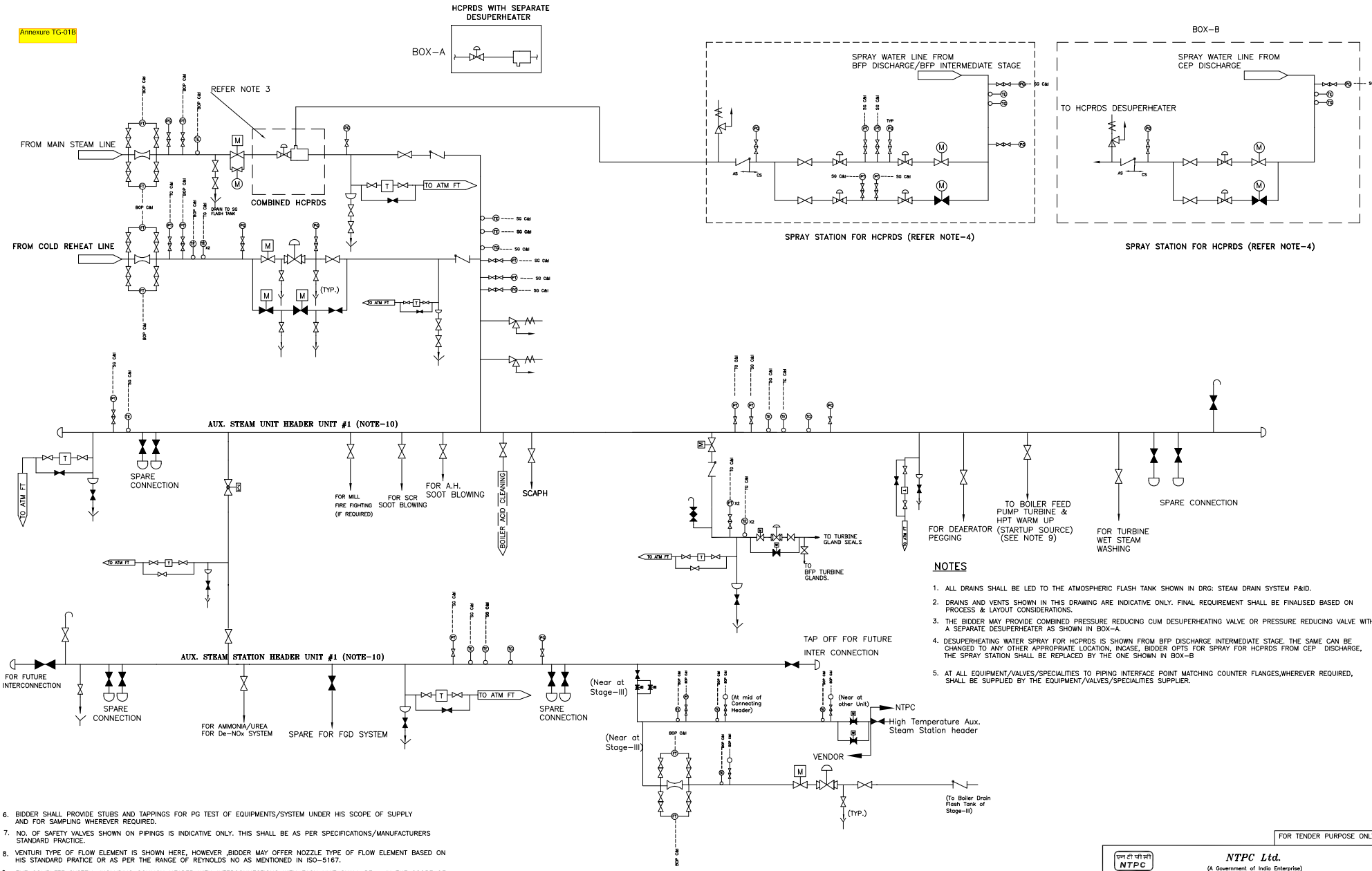
NTPC Ltd.
(A Government of India Enterprise)
ENGINEERING DIVISION

PROJECT: SIPAT STPP STAGE-III (1X800 MW)
(EPC PACKAGE)

TITLE: HP & LP BYPASS SYSTEM P&ID

SIZE	SCALE	DRG NO.	REV. NO.
A-1	NTS	XXXX-999-PDM-A-005	B

Annexure TG-01B



NOTES

1. ALL DRAINS SHALL BE LED TO THE ATMOSPHERIC FLASH TANK SHOWN IN DRG: STEAM DRAIN SYSTEM P&ID.
2. DRAINS AND VENTS SHOWN IN THIS DRAWING ARE INDICATIVE ONLY. FINAL REQUIREMENT SHALL BE FINALISED BASED ON PROCESS & LAYOUT CONSIDERATIONS.
3. THE BIDDER MAY PROVIDE COMBINED PRESSURE REDUCING CUM DESUPERHEATING VALVE OR PRESSURE REDUCING VALVE WITH A SEPARATE DESUPERHEATER AS SHOWN IN BOX–A.
4. DESUPERHEATING WATER SPRAY FOR HCPRDS IS SHOWN FROM BFP DISCHARGE INTERMEDIATE STAGE. THE SAME CAN BE CHANGED TO ANY OTHER APPROPRIATE LOCATION, INCASE, BIDDER OPTS FOR SPRAY FOR HCPRDS FROM CEP DISCHARGE, THE SPRAY STATION SHALL BE REPLACED BY THE ONE SHOWN IN BOX–B
5. AT ALL EQUIPMENT/VALVES/SPECIALITIES TO PIPING INTERFACE POINT MATCHING COUNTER FLANGES,WHEREVER REQUIRED, SHALL BE SUPPLIED BY THE EQUIPMENT/VALVES/SPECIALITIES SUPPLIER.
6. BIDDER SHALL PROVIDE STUBS AND TAPPINGS FOR PG TEST OF EQUIPMENTS/SYSTEM UNDER HIS SCOPE OF SUPPLY AND FOR SAMPLING WHEREVER REQUIRED.
7. NO. OF SAFETY VALVES SHOWN ON PIPINGS IS INDICATIVE ONLY. THIS SHALL BE AS PER SPECIFICATIONS/MANUFACTURERS STANDARD PRACTICE.
8. VENTURI TYPE OF FLOW ELEMENT IS SHOWN HERE, HOWEVER ,BIDDER MAY OFFER NOZZLE TYPE OF FLOW ELEMENT BASED ON HIS STANDARD PRATICE OR AS PER THE RANGE OF REYNOLDS NO AS MENTIONED IN ISO–5167.
9. THE COMPLETE SYSTEM, INCLUDING COMMON HEADER WITH INTERCONNECTIONS WITH EACH UNIT SHALL BE IN THE SCOPE OF VENDOR AND THE SYSTEM SHALL BE DESIGNED SO AS TO ENABLE STARTUP OF ANY UNIT WITH TDBFP BY TAKING MOTIVE STEAM FROM OTHER RUNNING UNITS.
10. #THE OPERATING PRESSURE AND TEMPERATURE OF AUX. STEAM UNIT STATION HEADER SHALL BE OPTIMIZED BY THE BIDDER MAINTAINING A MINIMUM 50C SUPERHEAT AND MINIMUM TEMPERATURE OF 310°C.
11. ALL THE INSTRUMENTS SHALL BE IN THE SCOPE OF BIDDER.THE MEASURING INSTRUMENTS INDICATED IN THE TENDER P&ID ARE MINIMUM THAT ARE REQUIRED TO BE PROVIDED BY THE BIDDER.IN CASE ADDITIONAL INSTRUMENTS ARE REQUIRED AS PER THE STANDARD & PROVEN PRACTICE OF BIDDER, THE SAME SHALL BE SUPPLIED WITHIN THIS CONTRACT.
12. SG–C&I,TG–C&I AND BOP–C&I PART OF DDCMIS ARE IN THE CONTRACTOR'S SCOPE OF SUPPLY.
13. ALL THE REMOTE INSTRUMENTS TO BE HOOKED UP TO THE SG CONTROL SYSTEM (AUX. PRDS CONTROL SYSTEM) UNLESS INDICATED OTHERWISE.

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.			APPD.	DATE
C	REVISED FOR TENDER							31.05.24
B	REVISED FOR TENDER							
A	RELEASED FOR TENDER							
		VCG	AS	PKD	M	C&I	AA	
					CLEARED BY			

FOR TENDER PURPOSE ONLY

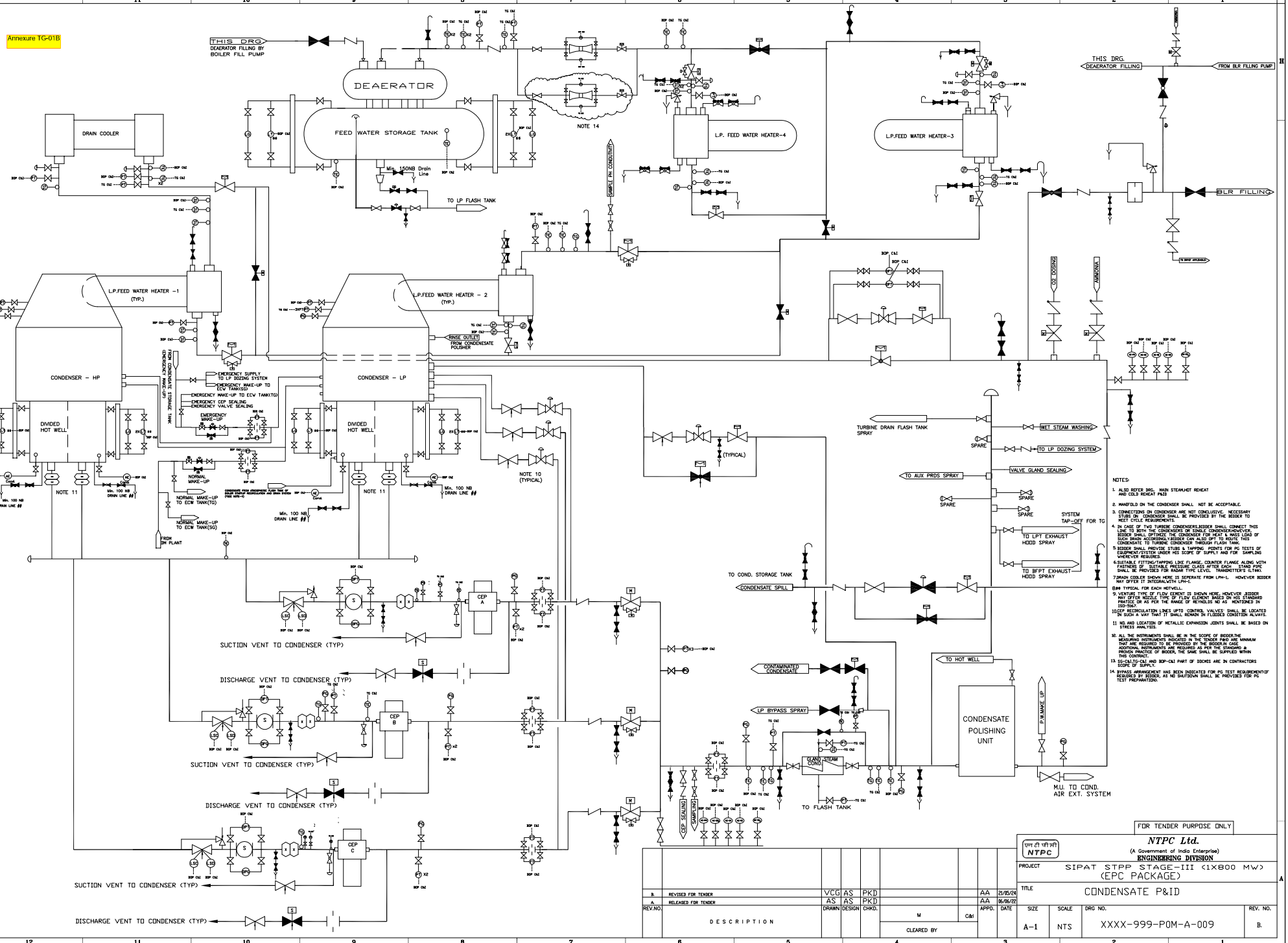
NTPC Ltd.
(A Government of India Enterprise)
ENGINEERING DIVISION

PROJECT: SIPAT STPP STAGE–III (1X800 MW) (EPC PACKAGE)

TITLE: AUXILIARY STEAM SYSTEM P&ID

SIZE	SCALE	DRG NO.	REV. NO.
A–1	NTS	XXXX–999–POM–A–006	C.

Annexure TG-01B



NOTES:

1. ALSO REFER DRG. MAIN STEAM,HOT REHEAT AND COLD REHEAT P&ID
2. MANIFOLD ON THE CONDENSER SHALL NOT BE ACCEPTABLE.
3. CONNECTIONS ON CONDENSER ARE NOT CONCLUSIVE. NECESSARY STUBS ON CONDENSER SHALL BE PROVIDED BY THE BIDDER TO MEET CYCLE REQUIREMENTS.
4. IN CASE OF TWO TURBINE CONDENSERS,BIDDER SHALL CONNECT THIS LINE TO BOTH THE CONDENSERS OR SINGLE CONDENSER,HOWEVER, BIDDER SHALL OPTIMIZE THE CONDENSER FOR HEAT & MASS LOAD OF SUCH DRAIN ACCORDINGLY.BIDDER CAN ALSO OPT TO ROUTE THIS CONDENSATE TO TURBINE CONDENSER THROUGH FLASH TANK.
5. BIDDER SHALL PROVIDE STUBS & TAPPING POINTS FOR PG TESTS OF EQUIPMENT/SYSTEM UNDER HIS SCOPE OF SUPPLY AND FOR SAMPLING WHEREVER REQUIRED.
6. SUITABLE FITTING/TAPPING LIKE FLANGE, COUNTER FLANGE ALONG WITH FASTNERS OF SUITABLE PRESSURE CLASS AFTER EACH STAND PIPE SHALL BE PROVIDED FOR RADAR TYPE LEVEL TRANSMITTER'S (LT##).
7. DRAIN COOLER SHOWN HERE IS SEPERATE FROM LPH-1. HOWEVER BIDDER MAY OFFER IT INTEGRAL WITH LPH-1.
8. ## TYPICAL FOR EACH HOTWELL.
9. VENTURI TYPE OF FLOW ELEMENT IS SHOWN HERE, HOWEVER ,BIDDER MAY OFFER NOZZLE TYPE OF FLOW ELEMENT BASED ON HIS STANDARD PRATICE OR AS PER THE RANGE OF REYNOLDS NO AS MENTIONED IN ISO-5167.
10. CEP RECIRCULATION LINES UPTO CONTROL VALVES SHALL BE LOCATED IN SUCH A WAY THAT IT SHALL REMAIN IN FLOODED CONDITION ALWAYS.
11. NO. AND LOCATION OF METALLIC EXPANSION JOINTS SHALL BE BASED ON STRESS ANALYSIS.
12. ALL THE INSTRUMENTS SHALL BE IN THE SCOPE OF BIDDER.THE MEASURING INSTRUMENTS INDICATED IN THE TENDER P&ID ARE MINIMUM THAT ARE REQUIRED TO BE PROVIDED BY THE BIDDER.IN CASE ADDITIONAL INSTRUMENTS ARE REQUIRED AS PER THE STANDARD & PROVEN PRACTICE OF BIDDER, THE SAME SHALL BE SUPPLIED WITHIN THIS CONTRACT.
13. SG-CW1,TG-CW1 AND BOP-CW1 PART OF DCMS ARE IN CONTRACTORS SCOPE OF SUPPLY.
14. BYPASS ARRANGEMENT HAS BEEN INDICATED FOR PG TEST REQUIREMENT(IF REQUIRED BY BIDDER, AS NO SHUTDOWN SHALL BE PROVIDED FOR PG TEST PREPARATION.

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	APPD.	DATE
B.	REVISED FOR TENDER	VCG	AS	PKD	AA	21/05/24
A.	RELEASED FOR TENDER	AS	AS	PKD	AA	06/06/22

CLEARED BY: M C&I

FOR TENDER PURPOSE ONLY

NTPC Ltd.
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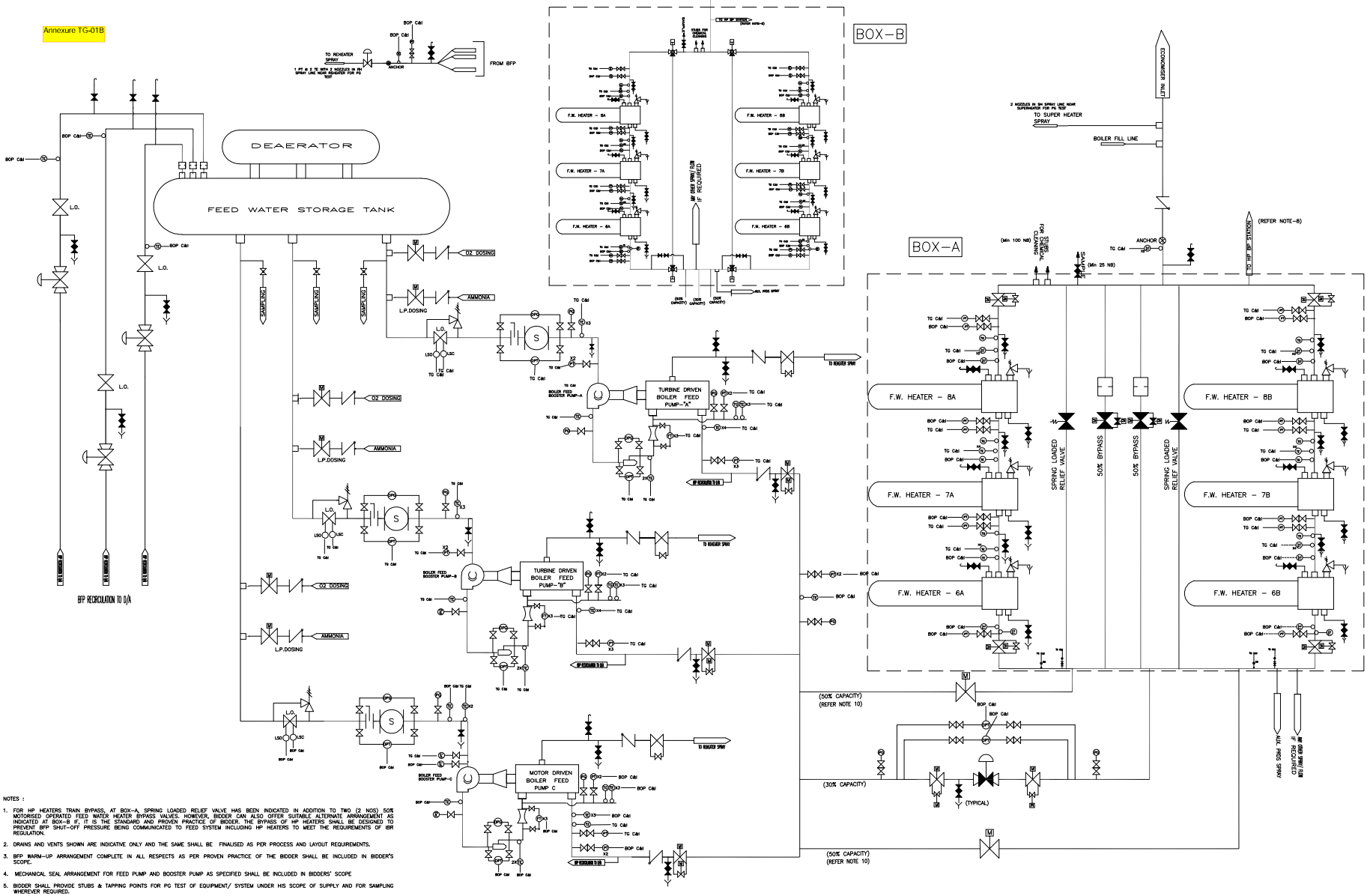
ENGINEERING DIVISION

PROJECT: SIPAT STPP STAGE-III (1X800 MW) (EPC PACKAGE)

TITLE: CONDENSATE P&ID

SIZE	SCALE	DRG NO.	REV. NO.
A-1	NTS	XXXX-999-POM-A-009	B.

Annexure TG-01B



NOTES :

1. FOR HP HEATERS TRAIN BYPASS, AT BOX-A, SPRING LOADED RELIEF VALVE HAS BEEN INDICATED IN ADDITION TO TWO (2 NOS) 50% MOTORISED OPERATED FEED WATER HEATER BYPASS VALVES. HOWEVER, BIDDER CAN ALSO OFFER SUITABLE ALTERNATE ARRANGEMENT AS INDICATED AT BOX-B IF, IT IS THE STANDARD AND PROVEN PRACTICE OF BIDDER. THE BYPASS OF HP HEATERS SHALL BE DESIGNED TO PREVENT BFP SHUT-OFF PRESSURE BEING COMMUNICATED TO FEED SYSTEM INCLUDING HP HEATERS TO MEET THE REQUIREMENTS OF IBR REGULATION.
2. DRAINS AND VENTS SHOWN ARE INDICATIVE ONLY AND THE SAME SHALL BE FINALISED AS PER PROCESS AND LAYOUT REQUIREMENTS.
3. BFP WARM-UP ARRANGEMENT COMPLETE IN ALL RESPECTS AS PER PROVEN PRACTICE OF THE BIDDER SHALL BE INCLUDED IN BIDDER'S SCOPE.
4. MECHANICAL SEAL ARRANGEMENT FOR FEED PUMP AND BOOSTER PUMP AS SPECIFIED SHALL BE INCLUDED IN BIDDERS' SCOPE
5. BIDDER SHALL PROVIDE STUBS & TAPPING POINTS FOR PG TEST OF EQUIPMENT/ SYSTEM UNDER HIS SCOPE OF SUPPLY AND FOR SAMPLING WHEREVER REQUIRED.
6. 2X50% LINE IS SHOWN HERE ALONG WITH 30% CAPACITY FEED CONTROL VALVE. HOWEVER INSTEAD OF 2X50% LINE ,BIDDER MAY OFFER 1X100% LINE ALONG WITH 30% CAPACITY FEED CONTROL VALVE.
7. VENTURI TYPE OF FLOW ELEMENT IS SHOWN HERE, HOWEVER ,BIDDER MAY OFFER NOZZLE TYPE OF FLOW ELEMENT BASED ON HIS STANDARD PRACTICE OR AS PER THE RANGE OF REYNOLDS NO AS MENTIONED IN ISO-5167.
8. TAPPING FOR HP BYPASS SPRAY HAS BEEN SHOWN DOWNSTREAM OF HP HEATERS. HOWEVER, BIDDER MAY TAKE THIS TAPPING UPSTREAM OF HP HEATER AS PER THEIR STANDARD PRACTICE.
9. ALL THE INSTRUMENTS SHALL BE IN THE SCOPE OF BIDDER.THE MEASURING INSTRUMENTS INDICATED IN THE TENDER P&ID ARE MINIMUM THAT ARE REQUIRED TO BE PROVIDED BY THE BIDDER.IN CASE ADDITIONAL INSTRUMENTS ARE REQUIRED AS PER THE STANDARD & PROVEN PRACTICE OF BIDDER, THE SAME SHALL BE SUPPLIED WITHIN THIS CONTRACT.
10. SG-C&I,TG-C&I AND BOP-C&I PART OF DDCMIS ARE IN THE CONTRACTOR'S SCOPE OF SUPPLY.
11. THE SIZE OF DRAIN LINES SHALL NOT BE LESS THAN 50 NB.

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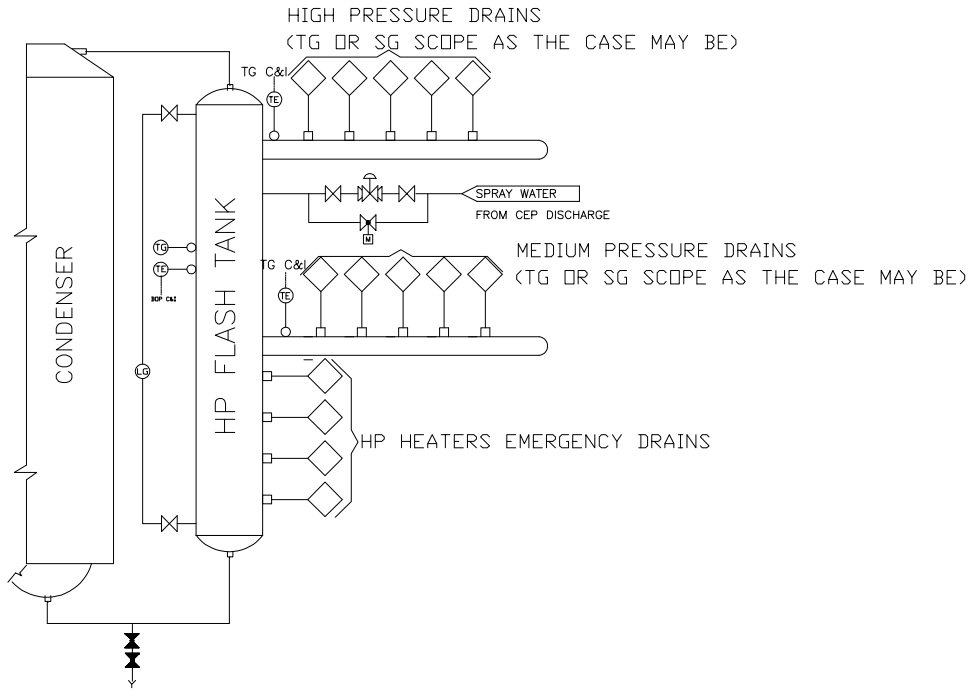
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	CLEARED BY	APPD.	DATE
B.	REVISED FOR TENDER	AS	AS	PKD	M	AA	21/05/24
A.	RELEASED FOR TENDER	AS	AS	PKD	C&I	AA	06/06/22

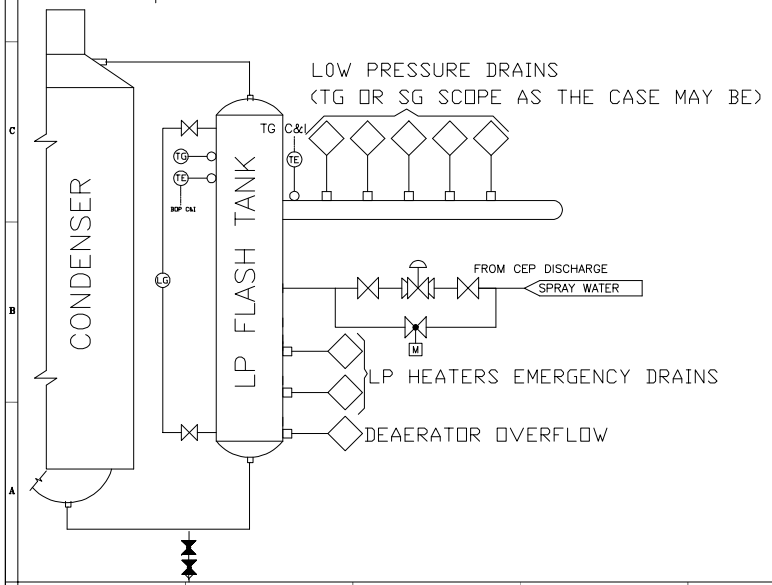
PROJECT: SIPAT STPP STAGE-III (1X800 MW) (EPC PACKAGE)

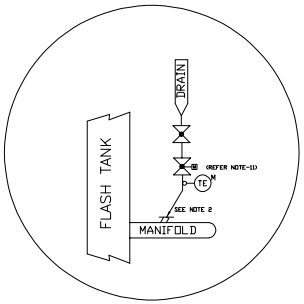
TITLE: FEED WATER P&ID

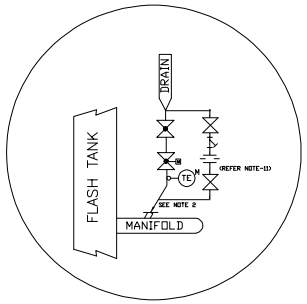
SIZE	SCALE	DRG NO.	REV. NO.
A-1	NTS	XXXX-999-POM-A-010	B.

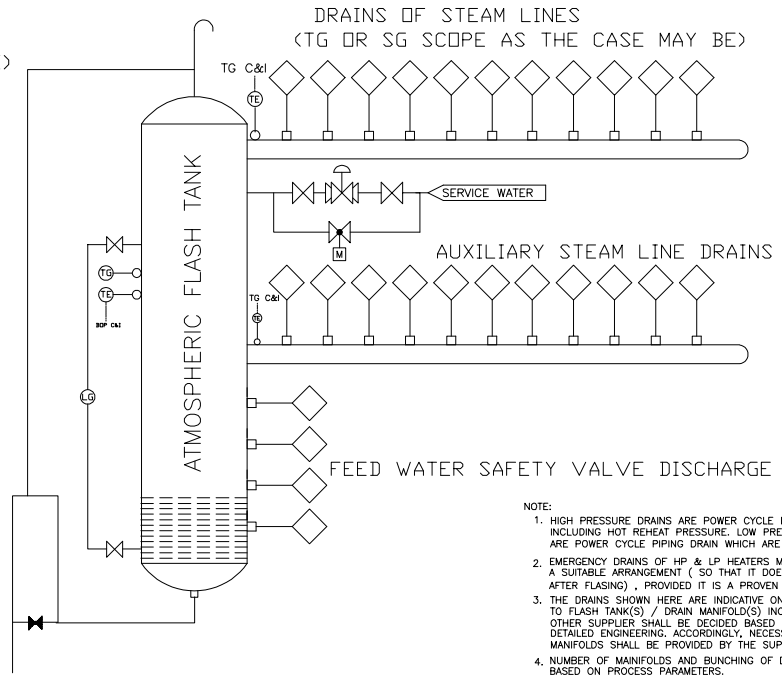
Annexure TG-01B











NOTE:

1. HIGH PRESSURE DRAINS ARE POWER CYCLE DRAINS WHICH ARE AT PRESSURE ABOVE AND INCLUDING HOT REHEAT PRESSURE. LOW PRESSURE DRAINS AND MEDIUM PRESSURE DRAINS ARE POWER CYCLE PIPING DRAIN WHICH ARE AT A PRESSURE BELOW HOT REHEAT PRESSURE.
2. EMERGENCY DRAINS OF HP & LP HEATERS MAY BE LED TO THE CONDENSER THROUGH A SUITABLE ARRANGEMENT (SO THAT IT DOES NOT DAMAGE THE CONDENSER COMPONENTS AFTER FLASING) , PROVIDED IT IS A PROVEN PRACTICE OF THE SUPPLIER.
3. THE DRAINS SHOWN HERE ARE INDICATIVE ONLY. FINAL REQUIREMENT OF DRAIN CONNECTIONS TO FLASH TANK(S) / DRAIN MANIFOLD(S) INCLUDING DRAINS FROM PIPING/EQUIPMENT OF OTHER SUPPLIER SHALL BE DECIDED BASED ON PROCESS/LAYOUT CONSIDERATION DURING DETAILED ENGINEERING. ACCORDINGLY, NECESSARY STUBS ON THE FLASH TANK(S)/DRAIN MANIFOLDS SHALL BE PROVIDED BY THE SUPPLIER.
4. NUMBER OF MAINIFOLDS AND BUNCHING OF DRAINS ON MANIFOLDS MAY BE CHANGED BASED ON PROCESS PARAMETERS.
5. IN ADDITION TO WHAT IS INDICATED IN THIS DRG. ALL THE REQUIREMENTS OF ASME-TDP (LATEST) SHALL BE DULY MET BY THE BIDDER. IN ADDITION, THE SUPPLIER SHALL INCLUDE THE SUPPLIES WHICH ARE AS PER SUPPLIERS STANDARD PRACTICE.
6. MINIMUM TWO NOS. OF STUBS ON EACH MANIFOLD ON EACH FLASH TANK SHALL BE PROVIDED BY THE SUPPLIER AS SPARE , AFTER FINALISATION OF TOTAL REQUIREMENT.
7. ALL THE INSTRUMENTS SHALL BE IN THE SCOPE OF BIDDER.THE MEASURING INSTRUMENTS INDICATED IN THE TENDER P&ID ARE MINIMUM THAT ARE REQUIRED TO BE PROVIDED BY THE BIDDER.IN CASE ADDITIONAL INSTRUMENTS ARE REQUIRED AS PER THE STANDARD & PROVEN PRACTICE OF BIDDER, THE SAME SHALL BE SUPPLIED WITHIN THIS CONTRACT.
8. ALSO REFER DRG. NO. XXXX-999-POM-A-004 TO XXXX-999-POM-A-011
9. IN LIEU OF HP & LP FLASH TANKS, BIDDER MAY ALSO OFFER FLASH BOXES ATTACHED TO CONDENSER, IF IT IS A STANDARD AND PROVEN PRACTICE OF THE BIDDER. HOWEVER, NUMBER OF FLASH TANKS/ FLASH BOXES SHALL BE AS INDICATED IN THIS TENDER P&ID.
10. TEMPRATURE ELEMENTS TE TO BE PROVIDED AT THE DOWNSTREAM OF ALL REMOTE CONTROLLED ON/OFF DRAIN VALVES. TEMPERATURE ELEMENT IS TO BE CONNECTED TO CONTROL SYSTEM WHEREIN UPSTREAM DRAIN VALVE IS BEING CONNECTED.
11. SG-C&I,TG-C&I AND BOP-C&I PART OF DDCMIS ARE IN CONTRACTORS SCOPE OF SUPPLY.
12. THE MOTORISED VALVE IN DRAIN LINES HAVE BEEN SHOWN IN THIS P&ID. HOWEVER, BIDDER MAY OFFER PNEUMATIC VALVES IN DRAIN LINES, IF IT IS A STANDARD & PROVEN PRACTICE OF THE BIDDER.
13. SIZING OF ATMOSPHERIC FLASH TANK AND SPRAY WATER TO IT, SHALL BE DONE BY THE BIDDER SUCH THAT WASTE WATER,IF DRAINED TO OPEN PIT,ITS TEMPERATURE SHOULD NOT BE MORE THAN 60 DEG C.
14. THE SIZE OF DRAIN LINES SHALL NOT BE LESS THAN 40 NB.

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.			APPD.	DATE
B	REVISED FOR TENDER PURPOSE	VCG	AS	PKD			AA	21/05/24
A	RELEASED FOR TENDER PURPOSE							06/06/22
		AS	AS	PKD	M	C&I	AA	
					CLEARED BY			

FOR TENDER PURPOSE ONLY

NTPC Ltd.
(A Government of India Enterprise)
ENGINEERING DIVISION

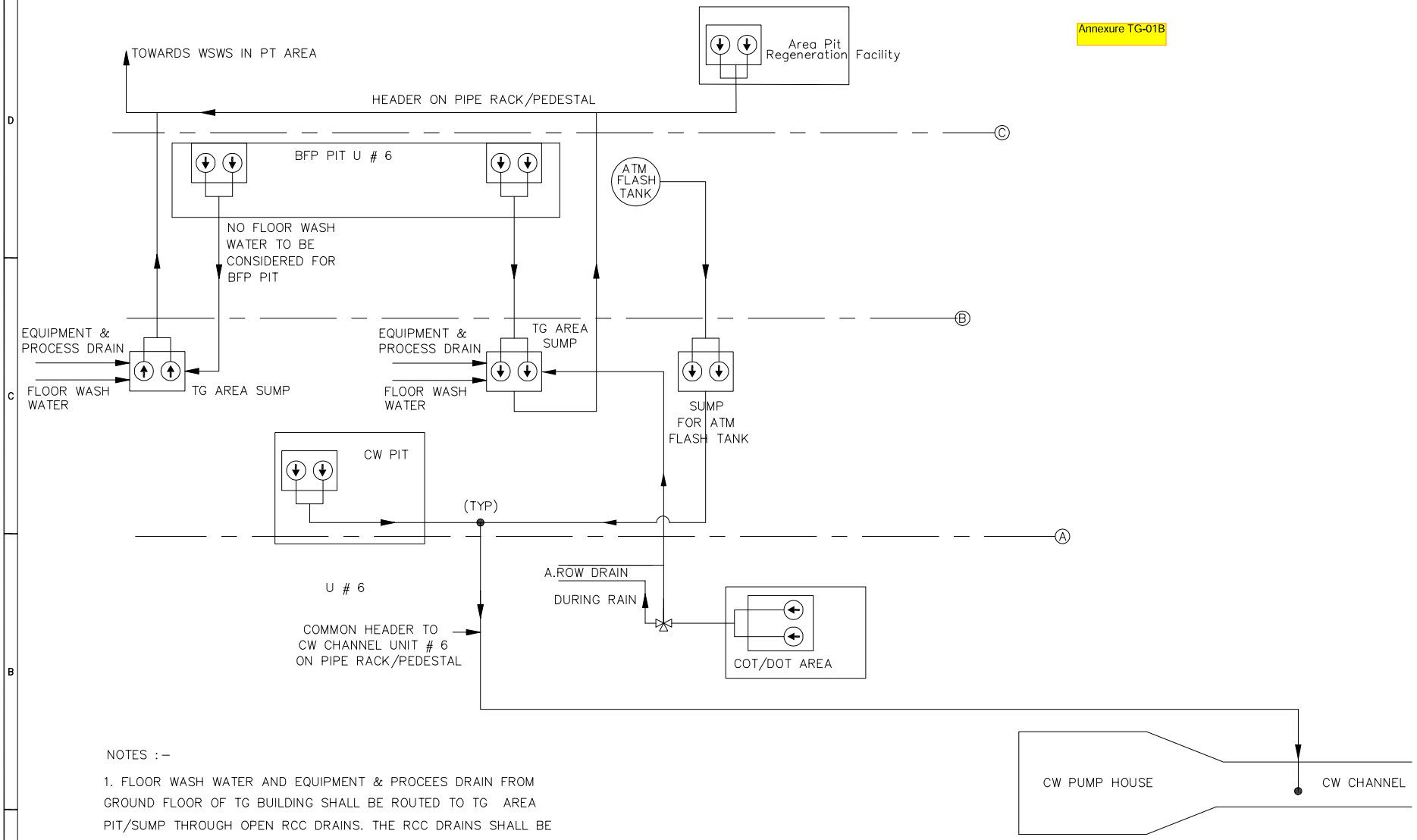
PROJECT: SIPAT STPP STAGE-III (1X800 MW)
(EPC PACKAGE)

TITLE: STEAM DRAIN SYSTEM P&ID

SIZE	SCALE	DRG NO.	REV. NO.
A-1	NTS	XXXX-999-POM-A-012	B

AUTOCAD DRG. NO.MJAISYS12

Annexure TG-01B



NOTES :–

1. FLOOR WASH WATER AND EQUIPMENT & PROCEES DRAIN FROM GROUND FLOOR OF TG BUILDING SHALL BE ROUTED TO TG AREA PIT/SUMP THROUGH OPEN RCC DRAINS. THE RCC DRAINS SHALL BE PROVIDED WITH REMOVABLE GI ELECTROFORGED GRATING COVER.

2. FLOOR WASH WATER AND EQUIPMENT & PROCEES DRAIN FROM VARIOUS UPPER FLOORS OF TG BUILDING SHALL BE ROUTED TO TG AREA PIT/SUMP THROUGH DOWNCOMER ALONG COLUMN.

FOR TENDER PURPOSE ONLY

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
B.	REVISED FOR TENDER PURPOSE	VCG	AS	PKD				AA		21.05.24
A.	RELEASED FOR TENDER PURPOSE				P	WS	PL	TG		

CLEARED BY

एन टी पी सी लिमिटेड
NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

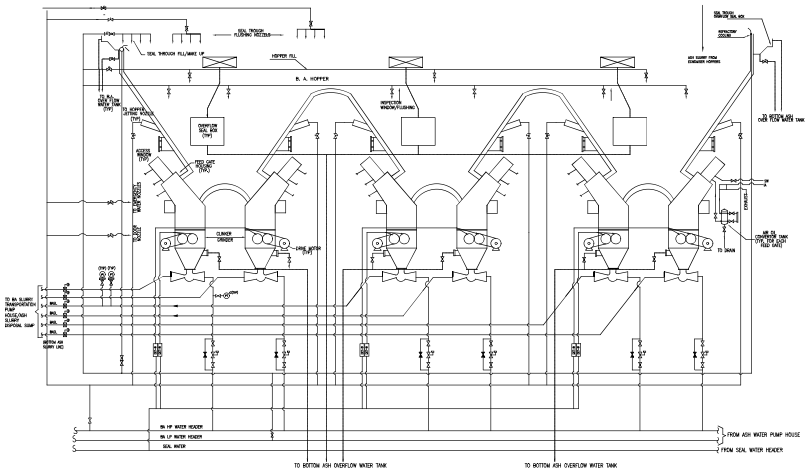
PROJECT: SIPAT STPP STAGE-III (1X800 MW) (EPC PACKAGE)

TITLE: SCHEME FOR PLANT EFFLUENT SEPARATION TG AREA

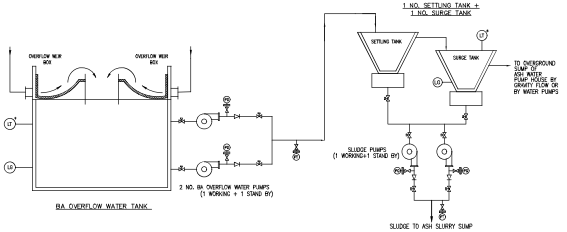
SIZE	SCALE	DRG.NO.	REV.
A3	NTS	XXXX-001-POM-A-015A	B.

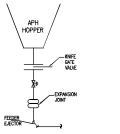
CAD FILE NAME : XXXX-001-POM-A-015A

Annexure MH-03B

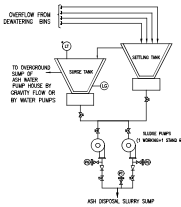


JET PUMP SYSTEM

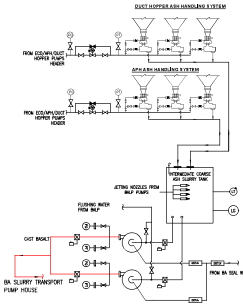


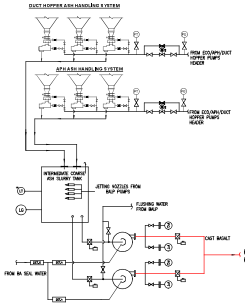


DETAIL-A

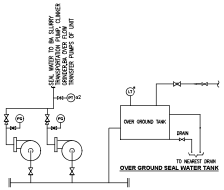


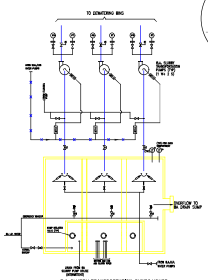
ASH DISPOSAL SLURRY SUMP



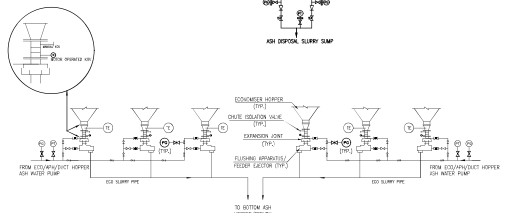


COARSE ASH SLURRY DISPOSAL SYSTEM

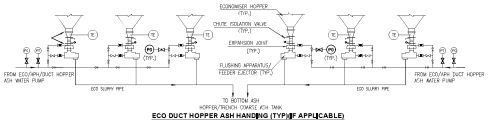




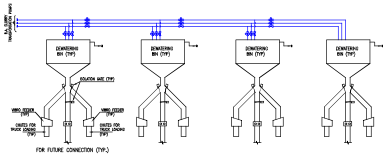
BA SLURRY TRANSPORTATION PUMPS HOUSE

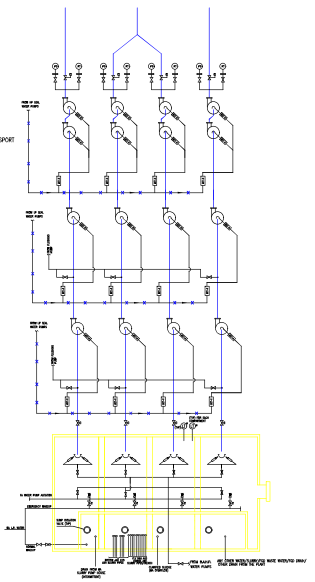


ECONOMISER HOPPERS (TYP)



ECO DUCT HOPPER ASH HANDING (TYP)(IF APPLICABLE)

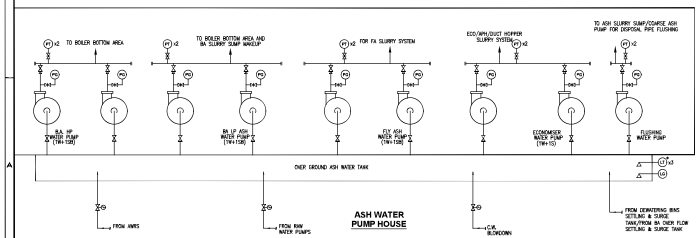


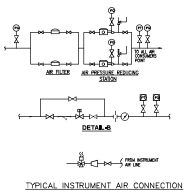


NOTES

1. BOTTOM ASH / ECO ASH / APH ASH / DUCT HOPPER ASH HANDLING SYSTEM SHOWN IS INDICATIVE. COMPLETE ASH HANDLING SYSTEM SHALL BE DESIGNED & SUPPLIED MEETING FUNCTIONAL REQUIREMENTS FOR THE SAME. THE NOS. OF ECONOMISER, DUCT HOPPERS AND AIR PREHEATER HOPPERS SHALL BE DECIDED BY THE BIDDER.
2. THE SCHEME & NO. OF PUMPS/EQUIPMENT SHALL BE FINALISED BASED ON STIPULATIONS OF TECHNICAL SPECIFICATION & SYSTEM REQUIREMENTS.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH TECH.SPECS. AND OTHER TENDER DOCUMENTS. BIDDER MAY OPTIMIZE THE LAYOUT MEETING THE FUNCTIONAL AND TECHNICAL REQUIREMENTS.
4. INSTRUMENTS SHOWN ARE INDICATIVE ONLY. COMPLETE INSTRUMENTATION SHALL BE PROVIDED AS PER SYSTEM & FUNCTIONAL REQUIREMENTS SPECIFIED.
5. THE BOTTOM ASH HOPPER OVERFLOW WATER SHALL BE LED TO AN OVERFLOW TANK. BOTTOM ASH OVERFLOW WATER PUMP SHALL TAKE SUCTION FROM THIS OVERFLOW TANK AND PUMP THE WATER TO THE REQUIRED TREATMENT FACILITIES. SUITABLE CHEMICAL TREATMENT / FILTRATION / CLARIFICATION ETC. SHALL BE PROVIDED SO THAT TSS OF OUTLET WATER AT DISCHARGE OF SETTLING TANK/SURGE TANK SHALL NOT BE MORE THAN 100 PPM BEFORE THE WATER IS BEING DISCHARGED TO THE SUMP OF ASH WATER PUMP HOUSE.
6. OVER FLOW FROM DEWATERING BINS SHALL BE TAKEN TO SETTLING TANK.SUITABLE CHEMICAL TREATMENT/ FILTRATION / CLARIFICATION ETC. SHALL BE PROVIDED SO THAT TSS OF OUTLET WATER AT DISCHARGE OF SETTLING TANK/SURGE TANK SHALL NOT BE MORE THAN 100 PPM BEFORE THE WATER IS BEING DISCHARGED TO THE SUMP OF ASH WATER PUMP HOUSE.
7. THE ASH SLURRY PIPING FROM THE DISCHARGE OF JET PUMP UP TO BA SLURRY TRANSPORTATION SUMP AND ASH SLURRY DISPOSAL SUMP SHALL BE BASALT LINED. ASH SLURRY TRANSPORTATION PIPING WITH IN SLURRY PUMP HOUSE AND UP TO DEWATERING BINS SHALL BE BASALT LINED.
8. FOR MEETING THE FLUSHING APPARATUS WATER REQUIREMENT OF ECO HOPPERS, TWO(2) NOS. (ONE WORKING AND ONE STANDBY) ECONOMISER ASH WATER PUMPS ALONG WITH VALVES, PIPES & FITTINGS SHALL BE PROVIDED FOR ALL UNITS.THESE PUMPS SHALL BE LOCATED IN ASH WATER PUMP HOUSE.
9. FOR SEALING OF BA COOLING WATER OVERFLOW PUMPS, COOLING OF BA OVERFLOW PUMP FLUID COUPLING, SEALING OF CLINKER GRINDERS ETC, BIDDER SHALL PROVIDE TWO (2) NOS. (1 WORKING + 1 STANDBY) SEAL WATER PUMPS.
10. LIMIT SWITCHES ARE TO BE PROVIDED FOR MANUAL VALVES AS PER SYSTEM REQUIREMENTS & CONTROL PHILOSOPHY.
11. FOR ALL INSTRUMENTS AND DRIVES, SUPPLIER TO ASSIGN UNIQUE TAG NUMBERS FOR IDENTIFICATION. THIS TAG NUMBERS SHALL BE INDICATED ON DOCUMENTS/DRAWINGS/DATA SHEETS APPLICABLE FOR THE RESPECTIVE INSTRUMENT/DRIVE.
12. FOR SEALING OF BA SLURRY TRANSPORTATION PUMPS, BIDDER SHALL PROVIDE TWO (2) NOS. (1 WORKING + 1 STANDBY) BA SEAL WATER PUMPS. IN CASE, BA SLURRY TRANSPORTATION PUMPS SHALL BE LOCATED INSIDE ASH SLURRY DISPOSAL PUMP HOUSE, HP & LP SEAL WATER PUMPS (AS SPECIFIED ELSEWHERE) FOR SLURRY DISPOSAL PUMP MAY BE PROVIDED FOR BOTH BA SLURRY TRANSPORTATION PUMPS & ASH SLURRY DISPOSAL PUMPS, IF FEASIBLE.
13. RECIRCULATION LINE ALONG WITH VALVES AND INSTRUMENTATION IN ASH WATER PUMPS SHALL BE PROVIDED.
14. ALL ACCESSORIES, ITEMS OF WORK, THOUGH NOT INDICATED BUT REQUIRED TO MAKE THE SYSTEM COMPLETE FOR ITS SAFE, EFFICIENT, RELIABLE AND TROUBLE FREE OPERATION AND MAINTENANCE SHALL ALSO BE INCLUDED IN BIDDER'S SCOPE UNLESS SPECIFICALLY EXCLUDED.

FOR TENDER PURPOSE ONLY





TYPICAL INSTRUMENT AIR CONNECTION

LEGEND :

PLUG VALVE	STRAINER	DIFFERENTIAL PRESSURE GUAGE
GLOBE VALVE	SOLENOID VALVE (PNEUMATICALLY OPERATED)	LEVEL INDICATOR
NON RETURN VALVE	MOTORISED VALVE	DIAPHRAGM SEAL
ISOLATION VALVE	ASH SLURRY VALVE	PNEUMATIC VALVE
ISOLATION VALVE (PNEUMATICALLY OPERATED)	PRESSURE TRANSMITTER	FLOW INDICATOR
RELIEF VALVE	LEVEL TRANSMITTER (ULTRASONIC TYPE)	BASL BOTTOM ASH SLURRY LINE
PUMP	LEVEL GAUGE	IA INSTRUMENT AIR LINE
PRESSURE SWITCH	INSTRUMENT VALVE	LS LEVEL SWITCH
PRESSURE GUAGE		

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&M CLEARED BY	APPD.	DATE
C	REISSUED FOR TENDER	ASHISH	ASHISH							17.05.24
B	REISSUED FOR TENDER	ASHISH	ASHUT							24.11.23
A	REISSUED FOR TENDER	ARPITA/ASHISH	ASHUT							10.08.23

CONSULTANT: एनटीपीसी NTPC

एनटीपीसी लिमिटेड
NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

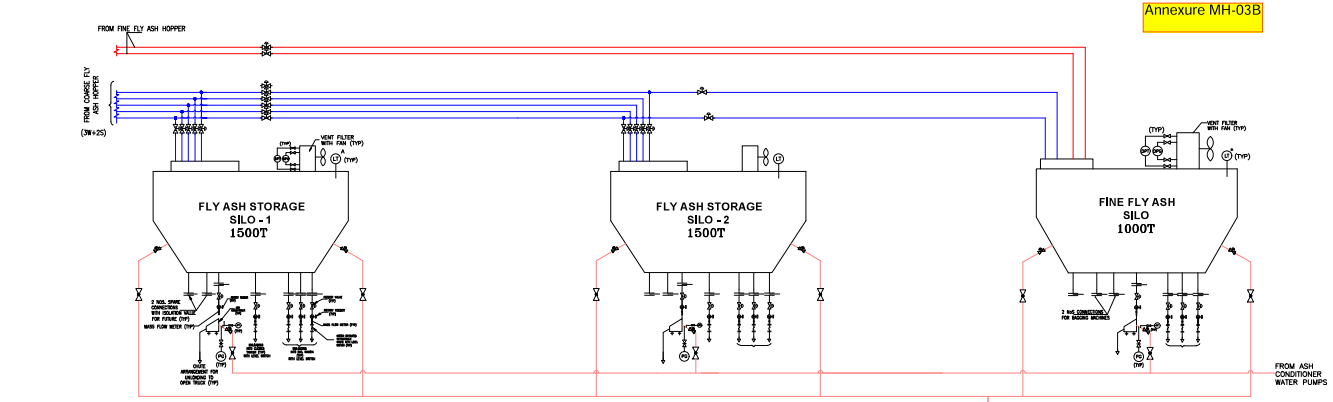
PROJECT: SIPAT THERMAL POWER STATION
STAGE-II (1×800 MW)

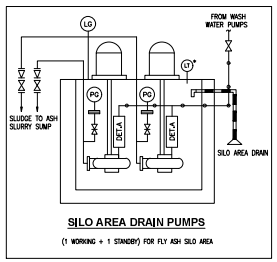
TITLE: EPC PACKAGE
SINGLE LINE FLOW DIAGRAM OF BOTTOM ASH HANDLING SYSTEM (JET PUMP SYSTEM) ASH DISPOSAL & ASH WATER SYSTEM

SIZE: A0 | SCALE: | DRG.NO.: XXXX-001-POM-A-025 | REV.: C

cad file name : XXXX-001(A)-POM-A-025.dwg

Annexure MH-03B



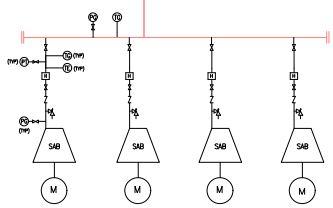


SILO AREA DRAIN PUMPS

(1 WORKING + 1 STANDBY) FOR FLY ASH SILO AREA

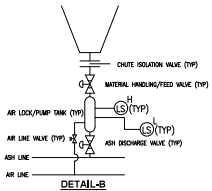
LEGEND :

- VACUUM BREAKER
- SOLENOID VALVE
- GLOBE VALVE
- BALL VALVE
- GATE VALVE
- NON RETURN VALVE
- Y-STRAINER
- PRESSURE RELEASE VALVE
- CHECK VALVE
- PNEUMATIC VALVE
- ISOLATION VALVE
- ISOLATION VALVE (CYL. OP.)
- H HEATER
- OLS OPEN LIMIT SWITCH
- DS DUST SENSOR
- FI FLOW INDICATOR
- PT PRESSURE TRANSMITTER
- PS PRESSURE SWITCH
- PG PRESSURE GAUGE
- ST SLURRY FLOW TRANSMITTER
- NDM NUCLEONIC DENSITY METER
- DM DENSITY METER (CORIOUS TYPE)
- M MOTOR
- VFD VARIABLE FREQUENCY DRIVE
- DPT DIFF PRESSURE TRANSMITTER
- DPS DIFF PRESSURE SWITCH
- DPG DIFF PRESSURE GAUGE
- LT* LEVEL TRANSMITTER (ULTRASONIC TYPE)
- LT** LEVEL TRANSMITTER (RADAR TYPE)
- LS LEVEL SWITCH
- LG LEVEL GAUGE
- LI LEVEL INDICATOR
- TE TEMP ELEMENT
- TG TEMP GAUGE
- VT VACUUM TRANSMITTER
- VG VACUUM GAUGE
- DP DEW POINT METER
- LT^ LEVEL TRANSMITTER-ACOUSTIC FREQUENCY BASED
- FT FLOW TRANSMITTER

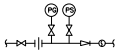


FLY ASH SILO-AERATION BLOWERS

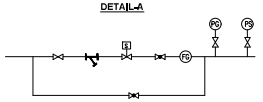
(3 WORKING + 1 COMMON STANDBY)



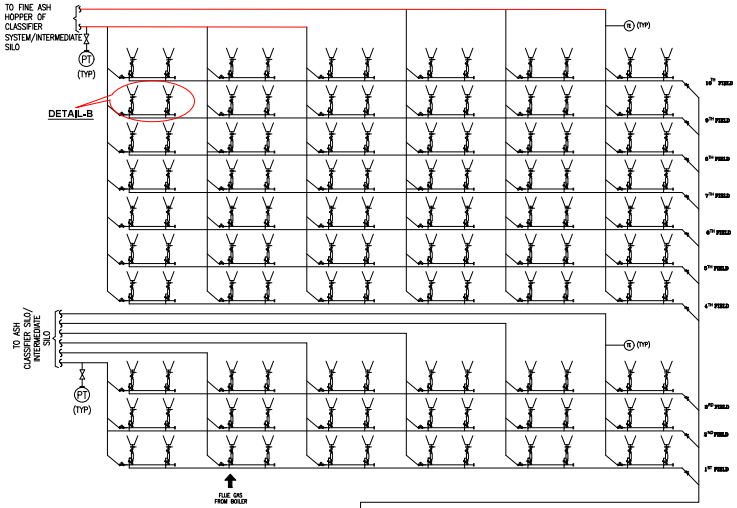
DETAIL-B

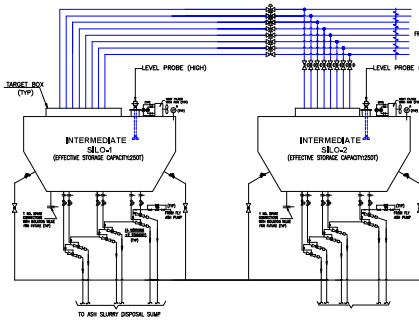


DETAIL-A



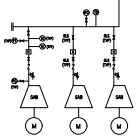
DETAIL-C

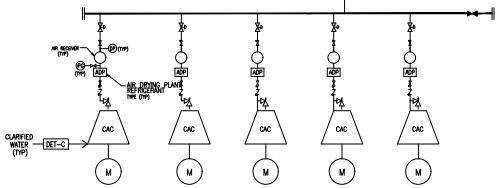




INTERMEDIATE SILOS

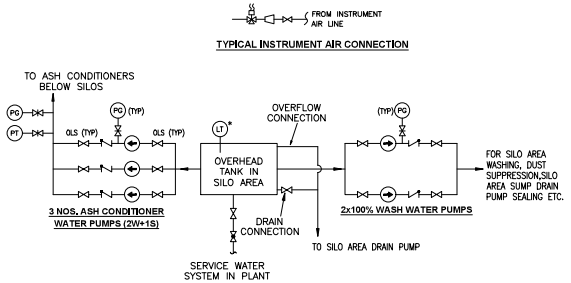
(1 WORKING + 1 STANDBY)





FIVE (5) CONVEYING AIR COMPRESSORS (CAC)

(3 WORKING +2 STANDBY)



WATER SCHEME FOR SILO AREA

TYPICAL INSTRUMENT AIR CONNECTION

NOTES:

1. FLY ASH CONVEYING SYSTEM FOR FLY ASH HOPPERS SHOWN IS INDICATIVE AND IS FOR ONE UNIT ONLY AND THE SAME SHALL BE IDENTICAL FOR OTHER UNIT. BIDDER TO PROVIDE FOR SEGREGATION OF COARSE AND FINE ASH FROM ESP HOPPERS. THE NUMBER OF ESP HOPPERS SHALL BE DECIDED BY BIDDER.
2. MATERIAL OF SEAL USED IN MATERIAL HANDLING VALVE SHALL BE SUITABLE FOR CONTINUOUS OPERATING TEMPERATURE AND ALSO SUITABLE FOR OCCASIONAL EXPOSURE TO MAXIMUM TEMPERATURE. BIDDER SHALL ALSO PROVIDE SUITABLE ARRANGEMENT TO TAKE CARE OF HOT AIR COMING OUT OF BUFFER HOPPER. BAG FILTERS SHALL BE SELECTED SUITABLE FOR TEMPERATURE SUITABLE UPTO 50°C MORE THAN THE PREDICTED TEMPERATURE AT BUFFER HOPPERS/MAIN STORAGE.
3. CONVEYING AIR COMPRESSORS, TRANSPORT AIR COMPRESSOR & INSTRUMENT AIR COMPRESSORS SHOWN ARE TYPICAL.
4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TECH. SPEC. AND OTHER TENDER DOCUMENTS.
5. INSTRUMENTS SHOWN ARE INDICATIVE ONLY. COMPLETE INSTRUMENTATION SHALL BE PROVIDED AS PER SYSTEM & FUNCTIONAL REQUIREMENTS AS SPECIFIED.
6. INSTRUMENT AIR PIPING IS NOT SHOWN IN THE DRG. IT SHALL BE ROUTED TO DIFFERENT VALVES, BAG FILTERS ETC. IN FLY ASH HANDLING SYSTEM AS PER SYSTEM DESIGN AND REQUIREMENTS.
7. SUITABLE DUST SUPPRESSION FACILITIES SHALL BE PROVIDED IN SILO AREA. RING HEADER WITH SUITABLE FOGGING NOZZLES (PLAIN WATER) ALONG THE PERIPHERY OF EACH SILO SHALL BE PROVIDED.
8. EACH TRANSPORT AIR COMPRESSOR AND CONVEYING AIR COMPRESSOR SHALL BE PROVIDED WITH INDEPENDENT AIR DRYING PLANT (REFRIGERANT TYPE, IF APPLICABLE) AND AIR RECEIVER AS PER TECH. SPECIFICATION.
9. a).EACH SILO AERATION BLOWER & BUFFER HOPPER AERATION BLOWER SHALL BE PROVIDED WITH INDEPENDENT AIR HEATERS AND ACCESSORIES AS PER TECH. SPEC.
   b) HOT AIR LINE FROM DISCHARGE OF HEATER (HEATER IF APPLICABLE) OF SILO AERATION BLOWER UP TO SILOS SHALL BE INSULATED.
10. NECESSARY HEAD ROOM (6.8M. MIN.) TO BE PROVIDED BELOW SILOS FOR TRUCK/RAIL WAGON MOVEMENT. THE SILO UNLOADING FACILITY SHALL BE SUITABLE FOR OPEN TRUCK/CLOSED TANKER/RAIL WAGON LOADING. HOWEVER, BIDDER SHALL ENSURE THAT THE CLEARANCE OF ASH SILOS OVER THE RAILWAY TRACKS SHALL BE AS PER RAILWAYS/RDSO GUIDELINES. THE SCOPE ALSO INCLUDES GETTING APPROVALS FROM RAILWAYS.
11. BOTH SILO AERATION AND BUFFER HOPPER AERATION BLOWERS SHALL BE AIR COOLED.
12. ALL DEVICES REQUIRING INSTRUMENT AIR SHALL BE PROVIDED WITH MANUAL ISOLATION VALVE IN IA LINE. THIS IS APPLICABLE FOR ENTIRE ASH HANDLING SYSTEM.
13. LIMIT SWITCHES ARE TO BE PROVIDED FOR MANUAL VALVES AS PER SYSTEM REQUIREMENTS & CONTROL PHILOSOPHY.
14. FOR ALL INSTRUMENTS AND DRIVES, SUPPLIER TO ASSIGN UNIQUE TAG NUMBERS FOR IDENTIFICATION. THIS TAG NUMBER SHALL BE INDICATED ON ALL DOCUMENTS/DRAWINGS/DATA SHEETS APPLICABLE FOR THE RESPECTIVE INSTRUMENT/DRIVE.
15. PRESSURE MEASUREMENT (TRANSMITTER) TO BE PROVIDED FOR INSTRUMENT AIR HEADER PRESSURE MEASUREMENT IN SILO AREA.
16. ONE NO. PT AND ONE NO. PG SHALL BE PROVIDED IN PULSE JETTING INSTRUMENT AIR HEADER/MANIFOLD OF SILO VENT FILTER.
17. BIDDER TO FURNISH ALL INSTRUMENTS/CONTROLS AS PER SYSTEM REQUIREMENT. INSTRUMENT AND CONTROLS FOR AUTOMATIC OPERATION OF PUMPS & EQUIPMENTS ARE NOT SHOWN FOR CLARITY IN THIS DRG. THE SAME SHALL BE PROVIDED AS PER SYSTEM REQUIREMENT AND AS SPECIFIED IN TECH. SPECIFICATION.
18. TWO (2) NOS. (ONE AT ENTRY & ONE AT EXIT) PITLESS TYPE WEIGH BRIDGE SHALL BE PROVIDED AT MAIN FLY ASH SILO AREA COMPLETE WITH ALL ELECTRICAL, CONTROLS, CIVIL AND STRUCTURAL WORKS FOR WEIGHMENT OF TRUCKS/TANKER FILLED FROM SILOS, ONE (1) NO. WEIGH BRIDGE FOR RAIL LOADING BELOW EACH MAIN FLY ASH SILO COMPLETE WITH ALL ELECTRICAL, CONTROLS, CIVIL AND STRUCTURAL WORKS. FOR WEIGHMENT FROM SILOS. MASS FLOW METER /SOLID FLOW METER FOR ONLINE WEIGHMENT OF TOTAL LOADED ASH OF WAGON/TRUCK DURING LOADING SHALL BE PROVIDED FOR EACH MAIN FLY ASH SILO, AS SPECIFIED.
19. ALL ACCESSORIES, ITEMS OF WORK, THOUGH NOT INDICATED BUT REQUIRED TO MAKE THE SYSTEM COMPLETE FOR ITS SAFE, EFFICIENT, RELIABLE AND TROUBLE FREE OPERATION AND MAINTENANCE SHALL ALSO BE INCLUDED BIDDER'S SCOPE UNLESS SPECIFICALLY EXCLUDED.

FOR TENDER PURPOSE ONLY

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
C	RELEASED FOR TENDER	NAKEN	ASHISH							17-05-22
B	RELEASED FOR TENDER	NAKEN	ABHIJIT							28-11-20
A	RELEASED FOR TENDER	NAKEN	ABHIJIT							31-05-20

CLEARED BY

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NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

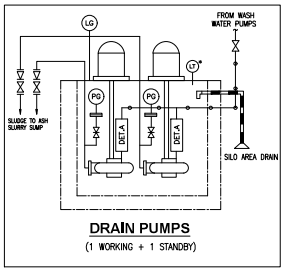
PROJECT: SIPAT SUPER THERMAL POWER PROJECT
STAGE-III (1x800MW)

TITLE: EPC PACKAGE
SINGLE LINE FLOW DIAGRAM FOR FLY ASH HANDLING SYSTEM (PRESSURE SYSTEM)

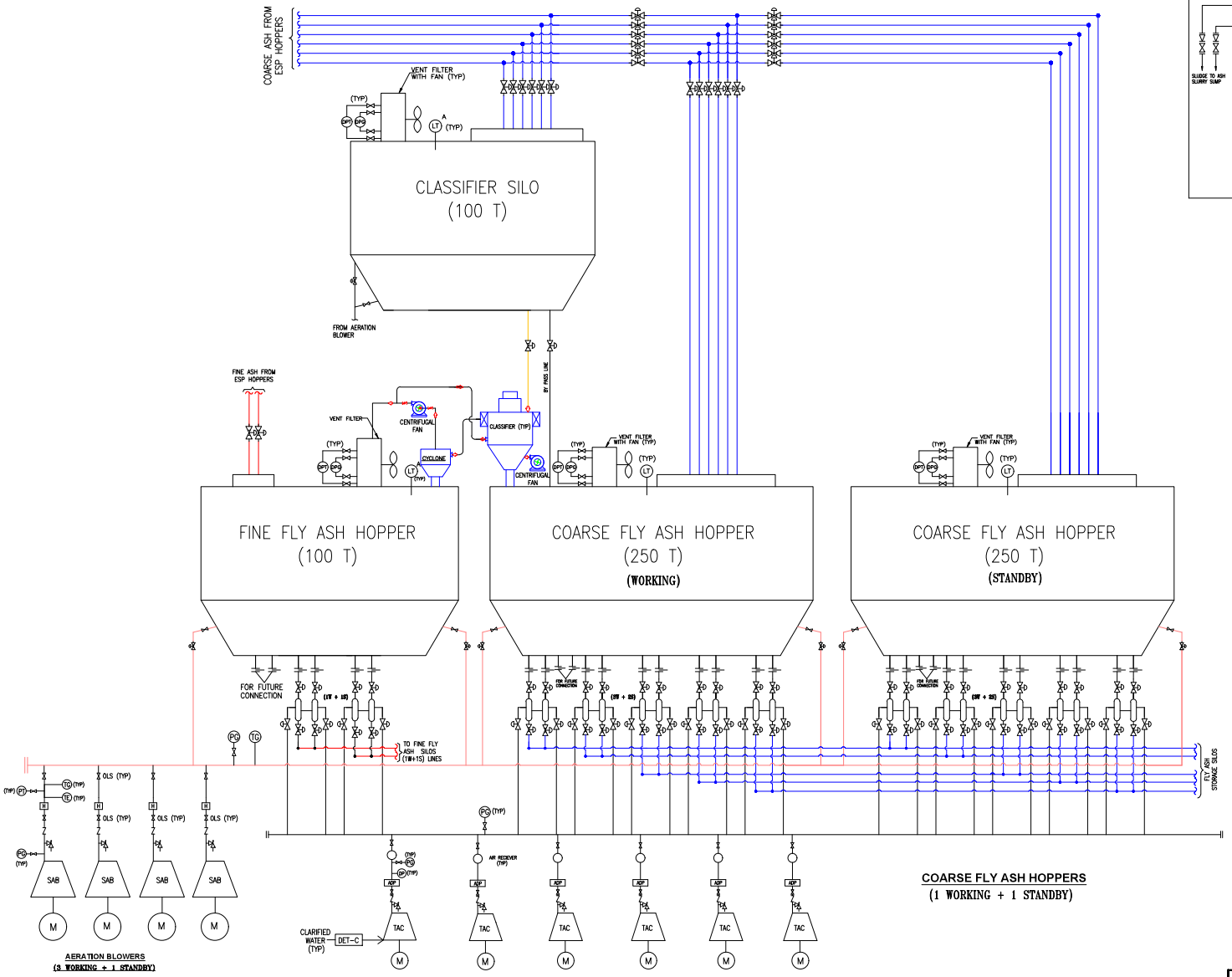
SIZE: A0 | SCALE: -- | DRG.NO.: XXXX-001-POM-A-028 | REV.: C

cad file name : XXXX-001(R)-POM-A-028.dwg

Annexure MH-03B



DRAIN PUMPS
(1 WORKING + 1 STANDBY)



COARSE FLY ASH HOPPERS
(1 WORKING + 1 STANDBY)

NOTES

1. ASH CLASSIFIER SYSTEM SHOWN IS INDICATIVE ONLY. ASH CLASSIFIER SYSTEM SHALL BE DESIGNED & SUPPLIED MEETING FUNCTIONAL REQUIREMENTS FOR THE UNIT. ASH CLASSIFIER SYSTEM SHALL BE COMPLETE WITH ALL EQUIPMENT & ACCESSORIES LIKE AIR SLIDE/SCREW CONVEYOR/BLOWER/WEIGHING BIN/FLOW CONTROL VALVE/FAN/VALVES ETC AS APPLICABLE.
2. THE SCHEME & NO. OF EQUIPMENT SHALL BE FINALISED BASED ON STIPULATIONS OF TECHNICAL SPECIFICATION & SYSTEM REQUIREMENTS.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH TECH.SPECS. AND OTHER TENDER DOCUMENTS. BIDDER MAY OPTIMIZE THE LAYOUT MEETING THE FUNCTIONAL AND TECHNICAL REQUIREMENTS.
4. INSTRUMENTS SHOWN ARE INDICATIVE ONLY. COMPLETE INSTRUMENTATION SHALL BE PROVIDED AS PER SYSTEM & FUNCTIONAL REQUIREMENTS SPECIFIED.
5. LIMIT SWITCHES ARE TO BE PROVIDED FOR MANUAL VALVES AS PER SYSTEM REQUIREMENTS & CONTROL PHILOSOPHY.
6. FOR ALL INSTRUMENTS AND DRIVES, SUPPLIER TO ASSIGN UNIQUE TAG NUMBERS FOR IDENTIFICATION. THIS TAG NUMBERS SHALL BE INDICATED ON DOCUMENTS/DRAWINGS/DATA SHEETS APPLICABLE FOR THE RESPECTIVE INSTRUMENT/DRIVE.
7. THIS OPTION IS APPLICABLE FOR SYSTEM WHERE ESP BUFFER HOPPER IS NOT ENVISAGED. OUT OF TWO NUMBERS COARSE ASH HOPPERS, ONE WILL BE WORKING AND ONE WILL BE STANDBY.
8. ALL ACCESSORIES, ITEMS OF WORK, THOUGH NOT INDICATED BUT REQUIRED TO MAKE THE SYSTEM COMPLETE FOR ITS SAFE, EFFICIENT, RELIABLE AND TROUBLE FREE OPERATION AND MAINTENANCE SHALL ALSO BE INCLUDED IN BIDDER'S SCOPE UNLESS SPECIFICALLY EXCLUDED.
9. QUANTITY, NUMBER OF LINES & CAPACITY OF EQUIPMENTS, AS INDICATED ARE MINIMUM.

FOR TENDER PURPOSE ONLY

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
C	RELEASED FOR TENDER	NAVEEN	ASHISH							17.09.24
B	RELEASED FOR TENDER	NAVEEN	ABHIJIT							29.11.23
A	RELEASED FOR TENDER	NAVEEN	ABHIJIT							01.06.23

CLEARED BY

एनटीपीसी NTPC

NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

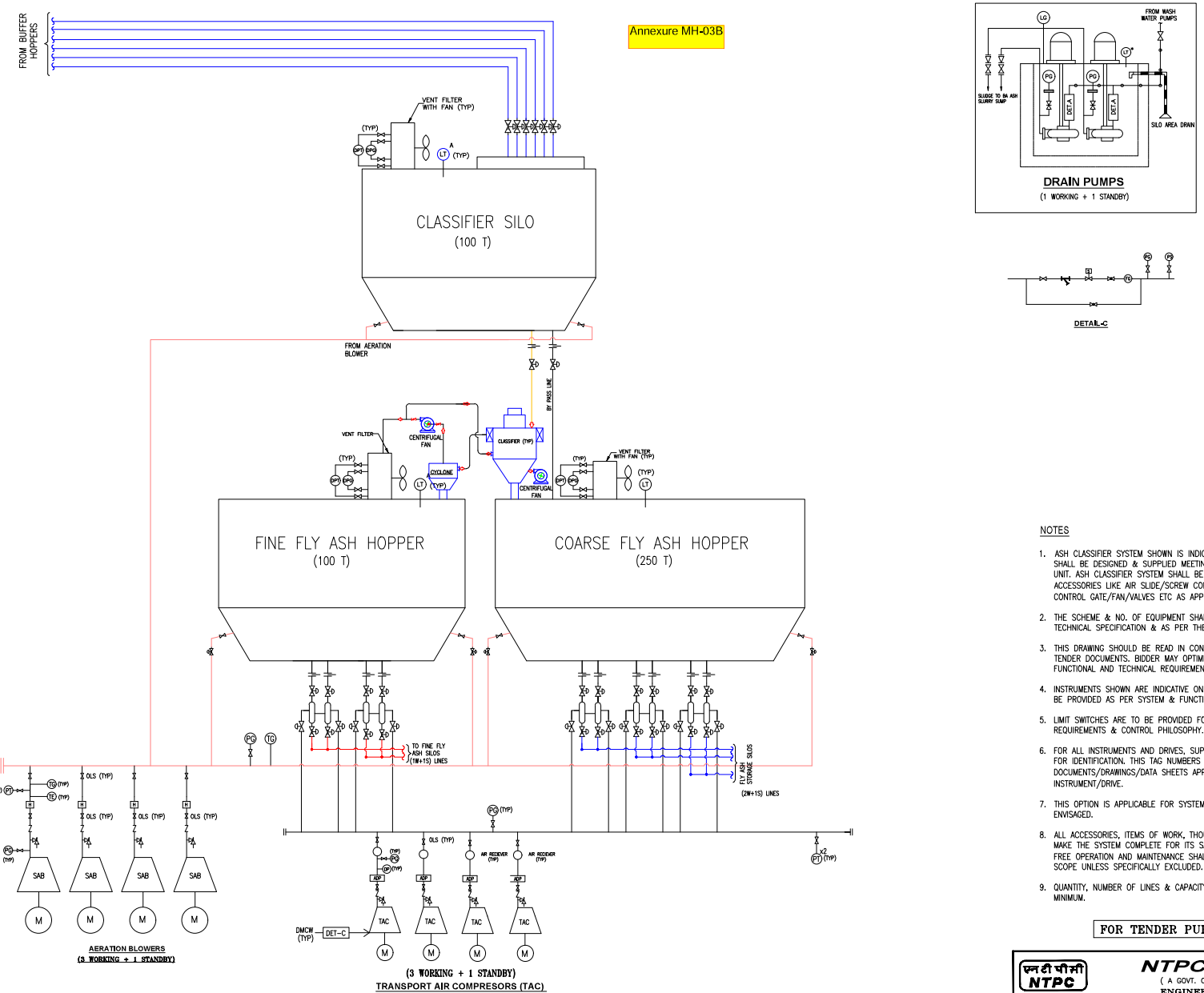
PROJECT: SIPAT SUPER THERMAL POWER PROJECT
STAGE-III (1x800MW)

TITLE: EPC PACKAGE
SINGLE LINE DIAGRAM FOR ASH CLASSIFIER SYSTEM (PRESSURE SYSTEM)

SIZE	SCALE	DRG.NO.	REV.
A1	--	XXXX-001-POM-A-029	C

CAD FILE NAME : XXXX-001-POM-A-029.dwg

Annexure MH-03B



NOTES

1. ASH CLASSIFIER SYSTEM SHOWN IS INDICATIVE ONLY. ASH CLASSIFIER SYSTEM SHALL BE DESIGNED & SUPPLIED MEETING FUNCTIONAL REQUIREMENTS FOR THE UNIT. ASH CLASSIFIER SYSTEM SHALL BE COMPLETE WITH ALL EQUIPMENT & ACCESSORIES LIKE AIR SLIDE/SCREW CONVEYOR/BLOWER/WEIGHING BIN/FLOW CONTROL GATE/FAN/VALVES ETC AS APPLICABLE.
2. THE SCHEME & NO. OF EQUIPMENT SHALL BE FINALIZED IN CONJUNCTION WITH TECHNICAL SPECIFICATION & AS PER THE SYSTEM REQUIREMENTS.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH TECH.SPECS. AND OTHER TENDER DOCUMENTS. BIDDER MAY OPTIMIZE THE LAYOUT MEETING THE FUNCTIONAL AND TECHNICAL REQUIREMENTS.
4. INSTRUMENTS SHOWN ARE INDICATIVE ONLY. COMPLETE INSTRUMENTATION SHALL BE PROVIDED AS PER SYSTEM & FUNCTIONAL REQUIREMENTS SPECIFIED.
5. LIMIT SWITCHES ARE TO BE PROVIDED FOR MANUAL VALVES AS PER SYSTEM REQUIREMENTS & CONTROL PHILOSOPHY.
6. FOR ALL INSTRUMENTS AND DRIVES, SUPPLIER TO ASSIGN UNIQUE TAG NUMBERS FOR IDENTIFICATION. THIS TAG NUMBERS SHALL BE INDICATED ON DOCUMENTS/DRAWINGS/DATA SHEETS APPLICABLE FOR THE RESPECTIVE INSTRUMENT/DRIVE.
7. THIS OPTION IS APPLICABLE FOR SYSTEM WHERE ESP BUFFER HOPPER IS ENVISAGED.
8. ALL ACCESSORIES, ITEMS OF WORK, THOUGH NOT INDICATED BUT REQUIRED TO MAKE THE SYSTEM COMPLETE FOR ITS SAFE, EFFICIENT, RELIABLE AND TROUBLE FREE OPERATION AND MAINTENANCE SHALL ALSO BE INCLUDED IN BIDDER'S SCOPE UNLESS SPECIFICALLY EXCLUDED.
9. QUANTITY, NUMBER OF LINES & CAPACITY OF EQUIPMENTS, AS INDICATED ARE MINIMUM.

FOR TENDER PURPOSE ONLY

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
C	RELEASED FOR TENDER	NAVEEN	ASHISH							
B	RELEASED FOR TENDER	NAVEEN	RAJESH							
A	RELEASED FOR TENDER	NAVEEN	RAJESH							

CLEARED BY

एनटीपीसी NTPC

NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: SIPAT THERMAL POWER STATION
STAGE-III (1x800MW)
EPC PACKAGE

TITLE: SINGLE LINE DIAGRAM FOR ASH CLASSIFIER SYSTEM (FOR VACUUM CONVEYING SYSTEM)

SIZE	SCALE	DRG.NO.	REV.
A1	--	XXXX-001(R)-POM-A-029	C

CAD FILE NAME : XXXX-001(R)-POM-A-029.dwg

Amendment-4B to Technical Specifications (Section VI) of SIPAT-III (1X800 MW) EPC Package

S. NO.	SPECIFICATION REFERENCE				EXISTING	Read as
	SEC/ PART	SUB-SEC.	PAGE NO.	CLAUSE NO.		
GEN-2B	Amendment Sl. No. GEN-1B of Amend-ment-01B to Technical Specifications (Section VI) of Sipat-III EPC Package				New Chapter added for Scope of Work for "Limited Notice to Proceed" (LNTP). Bidder to refer Annexure-C of Errata 01 to Commercial Amendment No. 05 to Bidding Document No: CS-9551/8003-001-2	New Chapter added for Scope of Work for "Limited Notice to Proceed" (LNTP). Bidder to refer Annexure-C of **Errata No 02 to Amend-ment No. 05** to Commercial portion of Bidding Document No: CS-9551/8003-001-2

1.0 Add the following new provisions regarding Limited Notice to Proceed (LNTP):

1.1 <u>Section II: Instructions to Bidders</u>

Modify the existing provision of ITB as under:

(i) Add the following Para at the end of ITB sub clause 13.1 (Period of Validity of Bid):

In case the Employer decides to proceed with the award of contract for Limited Notice to Proceed (LNTP) before awarding the Contract for the complete scope of work pursuant to ITB clause 32.0 (Notification of Award), the successful bidder shall be required to extend the validity of its bid such that it is valid for Two hundred ten (210) days from the date of award of LNTP.

(ii) Add the following Para at the end of ITB sub clause 30.1 (Award Criteria):

Alternatively, the Employer may initially grant Limited Notice to Proceed (LNTP) to such successful bidder for completing the Main plant basic engineering work and other works, if any, as detailed in the Technical Specification before awarding the Contract for the complete scope of work pursuant to ITB clause 32.0 (Notification of Award).

(iii) Add the following new sub clause 30.5 under ITB clause 30 (Award Criteria):

In case the Employer decides to proceed with the award of contract for Limited Notice to Proceed (LNTP) before awarding the Contract for the complete scope of work pursuant to ITB clause 32.0 (Notification of Award), the successful bidder shall be initially awarded a LNTP Contract for the Main plant basic engineering activities related to Equipment design/ Civil Construction design / drawing and other works, if any, as defined in Technical Specification at a price equivalent to 0.15% of FOB/Ex-Works Price component of Main Equipment in Bid Price.

In such an event, the successful bidder shall be required to furnish within ten (10) days from the date of award of LNTP the extension of bid security valid for a period of 45 days beyond the extended bid validity pursuant to clause 13.1 (Period of Validity of Bid).

(iv) The ITB sub clause 32.1 (Notification of Award) shall be modified as under:

Upon the successful Bidder’s furnishing of the performance securities of all the contracts or the performance security of LNTP whichever is earlier, pursuant to ITB clause 34, EMPLOYER will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to ITB Sub-Clause 12.5.

(v) Add the following Para at the end of ITB sub clause 34.1 (Performance Security):

In the event the Employer awards the Contract for LNTP to the successful Bidder pursuant to ITB Clause 30.5 (Award Criteria), the successful bidder shall be required to furnish within Fifteen (15) days from the date of award of LNTP the performance security for ten percent (10%) of Contract Price of LNTP as per the format enclosed with the bidding documents.

Performance Security shall be released after placement of NOA or foreclosure/closure of LNTP.

(vi) Add the following Para at the end of ITB sub clause 36 (Time Schedule):

Work Schedule & Deliverables of LNTP

(a) The LNTP activities shall be carried out in following three phases:

The bidder shall execute the main plant basic engineering of the equipment design/ Civil Construction design/drawing and other works, if any in Technical Specification and furnish the deliverables in three phases as detailed hereunder:

Phase-I – Finalization of drawing/documents and other works, if any, as defined in Technical Specification within 60 days from the date of issue of LNTP.

Phase-II – Finalization of drawing/documents and other works, if any, as defined in Technical Specification within 120 days from the date of issue of LNTP.

Phase-III:- Finalization of drawing/documents and other works, if any, as defined in Technical Specification within 180 days from the date of issue of LNTP.

(b) The Time for Completion of Facilities for each Unit identified in the Main Contract for the complete scope of work pursuant to ITB clause 36 (Time Schedule) shall be reduced by the period of work executed under LNTP, subject to maximum reduction of 4 months.

(c) The Time of Completion of the Facilities shall be determined from the date of Notification of Award.

1.2 Section V: Special Conditions of Contract

Add new provision of LNTP in Section V: Special Conditions of Contract as under:

1.2.1 The work under LNTP shall be executed in accordance with the terms & conditions specified hereunder:

(i) **Contract price of LNTP**

The Contract Price of LNTP shall be as specified in the LNTP and payment shall be made in the currencies mentioned therein.

(ii) T**he Terms of Payment of LNTP contract shall be as under:**

The contract price for LNTP shall be released upon phase wise completion of work for the main plant basic engineering activities related to Equipment design/Construction design/drawing and other work as defined in Technical Specification (Section-VI-Part-A) and subject to certification by the Engineer-in Charge in accordance with following terms and conditions:

a) 30% of LNTP price shall be paid upon successful completion of scope of work identified under Phase-I.

b) 30% of LNTP price shall be paid upon successful completion of scope of work identified under Phase-II.

c) 40% of LNTP price shall be paid upon successful completion of scope of work identified under Phase-III.

The payment for Phase-I shall be released only after receipt of performance security for LNTP & requisite bid security extension. Further, in the event LNTP is terminated by the Employer prior to its completion, the contractor shall not be eligible for any payment of any uncompleted portion of work.

The payments already made during LNTP shall be reduced from Initial Advance amount payment for FOB/Ex-Works Price Component after issuance of NOA.

(iii) **Performance Security for LNTP**

The Contractor shall, within fifteen (15) days of issuance of LNTP, provide security for the due performance of work for ten percent (10%) of the Contract Price of LNTP, with an initial validity upto ninety (90) days beyond the end of scheduled Completion of Work of LNTP.

The performance security shall be denominated in the currency or currencies of the LNTP Contract, or in a freely convertible currency acceptable to the Employer, and shall be in the form of unconditional bank guarantee provided in Section-VII (Forms and Procedures)-Form of Performance Security of the bidding documents.

Performance Security shall be released after placement of NOA or foreclosure/closure of LNTP.

The Bank Guarantee for LNTP shall be submitted from any of the banks as being acceptable for other performance securities in the bidding documents.

(iv) **Time for Commencement and Completion of LNTP**

The entire scope of work covered under LNTP shall be completed within 180 days from the date of LNTP.

Further, the Time for Completion of Facilities for each Unit identified in the Contract for the complete scope of work pursuant to GCC clause 8 (Time for Commencement and Completion) shall be reduced by the period of work executed under LNTP, subject to maximum reduction of 4 months.

In case NOA is issued to the successful Bidder within 6 months' period of issuance of LNTP, Payments already made shall be adjusted from Initial Advance against Ex works/CIF Supply and work schedule shall be proportionately adjusted commensurate with completed work during LNTP period.

However, in case NOA could not be placed beyond 6 months after LNTP, Employer and Contractor may mutually agree for NOA date and price bid validity extension and subsequent adjustment in Work Schedule.

(v) **Taxes and Duties on LTNP**

Taxes and duties shall be governed by GCC clause 14.

(vi) **Termination of LNTP**

In addition to the GCC sub clause 42.1.1 to 42.1.3 (Termination for Employer's Convenience), the LNTP contract shall automatically stand terminated (short closed) upon issuance of NOA by NTPC and furnishing the performance securities for ten percent (10%) of Contract Price for all the contracts as per GCC clause 13.3 by the Contractor. In such case, balance work shall be subsumed in scope of work defined in NOA.

Employer reserves its right not to issue NOA during or after LNTP and may terminate the Contract. In such a case, Employer shall be liable only for payments for completed work under scope of LNTP as certified by Engineer-in-Charge. No payment for balance work under LNTP shall be made and LNTP contract will be terminated.

(vi) The provisions of GCC which are relevant and not contrary to the provisions mentioned herein above, shall apply during the execution of work under LNTP. In case of any conflict, the provisions of LNTP mentioned herein above shall prevail over the GCC provisions.

1.3 **Section-VII: Forms & Procedures**

1.3.1 **Section-VII-2 of 3 (Bid Form-Price Bid)**

Add the following new clause in the Bid Form (Price Bid)

"In case you decide to proceed with Limited Notice to Proceed (LNTP) before placement of Notification of Award (NOA) on us, our Envelop-II (Price) Bid including Envelop-I (Techno- Commercial) Bid shall remain valid for Two hundred ten(210) days from the date of LNTP and it shall remain binding upon us."

1.3.2 **Section-VII-3 of 3 (Forms & Procedures)**

(i) **Appendix-1 (Terms and Procedures of Payment)**

Add the following Notes in S.No. A1 (FOB Price Component) and S.No. B1 (Ex-Works price component)

"The initial advance payment for FOB/Ex-Works Price Component (as applicable) shall be reduced by the payment made/due to the extent of work executed under LNTP contract. Accordingly Initial Advance payment Security shall also be reduced."

(ii) Add new Form as '**FORM OF 'LIMITED NOTICE TO PROCEED**' enclosed at **Annexure-A**.

(iii) Add new Form as **'Performance Security Form for LNTP'** enclosed at **Annexure-B**.

***Note:** The Scope of Work during the LNTP is attached as **Annexure-C.**

Annexure-A

FORM OF 'LIMITED NOTICE TO PROCEED'

NOTE : INSTRUCTIONS INDICATED IN ITALICS IN THIS LIMITED NOTICE TO PROCEED ARE TO BE TAKEN CARE OF BY THE ISSUING AUTHORITY.

Ref. No. :

Date :

..(Contractor's Name & Address)...

Attn : Mr...

Sub : Limited Notice to Proceed (LNTP) for... .....*(Package Name)* ..... as per Bid Document No.....

Dear Sir,

1.0 This has reference to the following :

(i) Our Invitation for Bids (IFB) No. .. ..dated……..

(ii) Bidding Documents for the subject package comprising the following: ……..***(List out all the Sections/Volumes of the Bidding Documents along with Tender Drawings etc. as issued to the bidder)……....*** Errata/Amendment No..... ... to.....***(Name of Section/Volume of the Bidding Documents to which Errata/ Amendment pertains)...*** issued.

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

(iii) Clarifications furnished to you on the Bidding Documents vide Clarification No…….. based on the query raised by **you/ one of the prospective bidders.** ***(Use as applicable)***

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO THE DATE OF BID OPENING)

(iv) Your Proposal for the subject package submitted vide Proposal ref No.... dated…..

(v) Our Fax message/letter No. .....dated.....regarding extension of validity of bid and that of the Bank Guarantee towards Bid Security.

(Applicable only if any extension has been sought subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO OR BY THE BIDDER AFTER BID OPENING)

(vi) Our Fax message/letter No. .. .. dated.....inviting you for post bid discussions.

(vii) Post bid discussions and meetings we had with you from……..... to …….. resulting into the following Minutes of Meeting :

(a) Minutes of Meeting regarding Commercial issues (APPENDIX-….)

(b) Minutes of Meeting on Technical issues (APPENDIX - ….. .)

(c) Minutes of Meeting regarding Work Schedule (APPENDIX - ….....)

(d) Minutes of Meeting regarding Quality Assurance Aspects (APPENDIX-…)

2.0 Based on your proposal submitted vide Proposal ref no. ……dated ….read in conjunction with all the specifications, terms & conditions of the Bidding Documents, **Your subsequent letters*(Use if relevant)*** and agreed Minutes of Meeting referred to in para 1.0 above, we hereby award on you the Limited Notice to Proceed to commence the basic engineering activities ***..*** of***... (Name of Package)*** ... .for ***(Name of project)***.. .. as per Bid Document No. :……. (hereinafter referred to as the 'LNTP').

3.0 **PRICE**

The total consideration for the entire scope of work covered under this LNTP shall be …(specify the amount and currency)……. as per the following break-up:

S.No.	Particulars	Amount
(i)	**Price for LNTP for basic engineering activities related to Equipment design/ Civil Construction design/ drawing and other works as defined in Technical Specification**	

4.0 You shall furnish performance security for ten percent (10%) of the Contract Price of LNTP within ten (10) days from the date of award of LNTP as per the format provided in the bidding documents.

5.0 Within ten (10) days from the date of award of LNTP, you shall also furnish extension of bid security valid till 255 days from the date of award of LNTP.

6.0 This LNTP is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorised signatory of your company as a proof of your acknowledgement and confirmation.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,
for and on behalf of
..***(Name of the Employer)...***

(Authorised Signatory)

Encl. : As above.

Annexure-B

Performance Security Form for LNTP

(To be stamped in accordance with the Stamp Act, if any, of the Country of the issuing Bank) :

Bank Guarantee No...

Date...

To,
[Employer's Name & Address]

Dear Sirs,

In consideration of the ... .*[Employer's Name]*... (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) having awarded to M/s .....*[Contractor's Name]*... with its Registered /Head Office at .....(hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Employer's Limited Notice to Proceed No. ..... dated……valued at ……..[LNTP Contract Price]……....for….....[Name of the Package & Project]…….(hereinafter referred to as the 'Contract') and the same having been unequivocally accepted by the contractor, and the Contractor having agreed to provide a Performance Guarantee for the faithful performance of the entire Contract equivalent to ……(*).....% (……percent) of the said value of the Contract to the Employer.

We .....*[Name & Address of the Bank]*... .....having its Head Office at..... ...(hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any and all monies payable by the Contractor to the extent of ... ...(*)..... as aforesaid at any time upto ... .(@)... *[days/month/year]* without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the Bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantee herein contained shall be enforceable till ninety (90) days after expiry of its validity.

The Employer shall have the fullest liberty, without affecting in any way the liability of the Bank under this guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any

other course or remedy or security available to the Employer. The Bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving the Bank.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to..... .(*)... ..... and it shall remain in force upto and including ...(@)..... and shall be extended from time to time for such period, as may be desired by M/s... .. ..*[Contractor's Name}*..... on whose behalf this guarantee has been given.

Dated this .... day of ..... 20..... at...

WITNESS

(Signature)...

(Signature)

(Name)...

(Name)

(Official Address)

(Designation with Bank Stamp)

Authorised Vide Power of Attorney No...
Dated...

Notes :1. (*) This sum shall be 10% of the LNTP Contract price.

(@) This date will be ninety (90) days after the schedule period of completion of work under LNTP.

2. The Bank Guarantee shall be from a Bank as per provisions of Section-V (SCC) of the bidding documents.

3. The stamp papers of appropriate value shall be purchased in the name of guarantee issuing Bank or the Party on whose behalf the BG is being issued. The Bank Guarantee shall be issued on a stamp paper of value as applicable in the State of India from where BG has been issued or the State of India from where the BG shall be operated, whichever is higher.

4. While getting the Bank Guarantee issued, the contractor is required to ensure compliance to the points mentioned in Form 16-Form of Bank Guarantee Verification Check List enclosed with the bidding documents. Further, the Contractor is required to fill up this Form 16 and enclose the same along with the Bank Guarantee.

[This scope of work is a part of Technical Specification (Section-VI-Part-A)]

The contractor shall be required to carry out basic engineering of the main plant systems/equipments in line with requirements stipulated in tender documents and subsequently adhere to the same while carrying out the detail engineering of the plant.

In case of Vendor finalization for sub-QR items identified below, contractor shall complete all necessary activities during LNTP period to be ready for award including opening of Price Bid.

The scope of works under LNTP shall include but not limited to the following:

Basic Engineering of Main plant area i.e. SG and STG including civil works, finalization of sub-vendors

Basic engineering of Main Plant area consisting of SG, TG and Civil works shall be included in scope of LNTP. Broad scope under basic engineering is divided under three phases and will cover the following:

A. **Phase-I** – Submission/Review of following drawings/documents within 60 days from the date of issue of letter of award for LNTP:

i) General layout plan
ii) BTG layout from transformer yard to centerline of stack
iii) Heat Balance Diagrams
iv) Water balance diagram
v) Boiler Predicted Performance Data at different loads & firing with different coals
vi) Boiler and turbine start-up curve
vii) Sizing Calculations – Boiler area (Furnace, Heat Duty, Boiler Efficiency, Air & gas weight, Circulation, Burner sizing , NOx, Buckstay, Ducts, Pressure Parts), Mills, APH, SCAPH, Fans, Boiler circulation pump, Safety valve, ESP, FGD, Fuel oil system, TG Hall EOT Crane capacity selection, HP & LP Heaters, GSC, Deaerator, BFP, CEP, Drip Pump, Condenser, Critical piping including HP/LP Bypass piping, Coal bunkers.
viii) Finalization of System P&IDs –Main steam, CRH, HRH and Feed water.
ix) Design basis for support structures for Boiler/ESP/FGD

Details submitted in the phase-I as mentioned above during LNTP period shall be updated and re-submitted within 10 days, taking into accounts observations /comments furnished by NTPC on the 1st submission. Completion of scope of Phase-I shall be considered when minimum 70% of drawings/documents identified under Phase-I are approved in Cat-I/IV and no drawings/documents will be in Cat-III.

B. **Phase-II** – Submission of following drawings/documents within next 60 days (after submission of Phase–I drawings/documents) i.e. within 120 days from the date of issue of letter of award for LNTP:

i) Power house equipment layouts i.e. layout arrangement drawings for Turbine hall (all floors) bays, Boiler area and ESP up to Chimney drawings indicating unit pitch, column spacing, passages and maintenance bays/spaces etc.
ii) Crane clearance diagram
iii) Finalization of System P&IDs – Boiler (Steam & water, Air & flue gas, APH, Fuel oil), Steam Drain system, Condenser & air extraction system, condensate system, HP & LP Bypass system, Extraction steam for HP & LP Heaters, CW System (as applicable), Heaters/Deaerator Drain & vents, Auxiliary steam, etc.
iv) Critical piping layout
v) General Arrangement Drawings for Boiler, Mill bay, Turbine, Generator and Coal bunkers.

[This scope of work is a part of Technical Specification (Section-VI-Part-A)]

vi) Pressure parts arrangement, Pressure parts expansion movement diagram, fuel piping arrangement & loading plan
vii) Submission of loading data for Boiler and A/B/C column of TG building.
viii) Sizing calculation: CW pump (as applicable), HP-LP Bypass.
ix) Sub-vendor finalization for critical equipment i.e. EOT crane, FGD, major transformers like Generator Transformer, Unit Transformer, Station transformer.
x) Plant Electrical System design calculations and equipment sizing like- Generator, Power Transformers, MV transformers and MV switchgear sizing calculations, short circuit calculations.
xi) Submission of Key Single Line Diagrams for main plant & off-site.
xii) Plan & Sections for site levelling works
xiii) Layout, design and cross section details of Roads, drains and culverts
xiv) Boundary wall layout, details and calculations.
xv) Standard details and General notes for Structural, Civil works.
xvi) Design and drawings of Safety Control room
xvii) Design and drawings of Safety Park building
xviii) Design and drawings of Sheds for Construction workers and O&M Workers.
xix) Geotechnical investigation & report and recommendations and Topography work & report

Details submitted in the phase-II as mentioned above during LNTP period shall be updated and re-submitted within 10 days, taking into accounts observations /comments furnished by NTPC on the 1st Submission. Completion of scope of Phase-II shall be considered when minimum 70% of drawings/documents identified under Phase-II are approved in Cat-I/IV and no drawings/documents will be in Cat-III.

C. **Phase-III** :- Submission of following drawings/documents within next 60 days (after submission of Phase –II drawings/documents) i.e. within 180 days from the date of issue of letter of award for LNTP:

i. Civil construction drawings for foundation of following including foundation load details, base plate & anchor bolt arrangement:
   a. Main TG Building and column
   b. TG foundation
   c. Main boiler
   d. Mill bay building and Mills
ii. Switchyard single line diagram and Protection SLD.
iii. Sub-vendor finalization for ACC/WCC (as applicable), IDCT (as applicable), Construction Power, Civil Enabling Works (as identified in Phase-II).
iv. Scheme/scope drawings for Main TG building
v. Switchyard Earth mat design and battery sizing.

Details submitted in the phase III as mentioned above during LNTP period shall be updated and re-submitted within 14 days, taking into accounts observations /comments furnished by NTPC on the 1st submission. Completion of scope of Phase-III shall be considered when minimum 70% of drawings/documents identified under Phase-III are approved in Cat-I/IV and no drawings/documents will be in Cat-III.

NOTE –

1. For the payment purpose billing break-up shall be submitted by the contractor.
2. List of drawings/documents is attached at **Appendix-I** and shall be part of LNTP scope.
3. The LNTP scope will include both (scope as well as drawings/documents.

APPENDIX-I

DRAWINGS/DOCUMENTS FOR LNTP SCOPE

			Area	Phase-I	Phase-II	Phase-III
S. NO.	**NTPC_DRG_NO**	**DRG_TITLE**				
1	XXXX-110-110-PVM-U-032	HEAT BALANCE DIAGRAMS	TG	I		
2	XXXX-110-110-PVM-N-004	TURBINE START UP CURVES	TG	I		
3	XXXX-110-110-PVM-U-021	BFP SIZING INCLUDING NPSH CALCULATION	TG	I		
4	XXXX-110-110-PVM-U-010	CEP & DRIP PUMP SIZING INCLUDING NPSH CALCULATION	TG	I		
5	XXXX-110-110-PVM-B-064A	HP & LP Bypass sizing	TG		II	
6	XXXX-110-110-PVM-U-014B	THERMAL & HYDRAULIC DESIGN CALCULATIONS FOR LP HEATERS, HP HEATERS AND EXTERNAL DE-SUPERHEATERS	TG			
7	XXXX-001-110-PVM-U-015	THERMAL and HYDRAULIC DESIGN CALCULATIONS FOR GSC	TG	I		
8	XXXX-110-110-PVM-U-018A	THERMAL AND HYDRAULIC DESIGN CALCULATIONS OF DEAERATOR	TG	I		
9	XXXX-110-110-PVM-U-028	TG HALL EOT CRANE CAPACITY SELECTION CALCULATION	TG	I		
10		Load data (Not to exceed) for Main Turbine Hall equipment : BFPs, Heaters and D/A etc	TG	I		
11	XXXX-001-110-PVM-F-026	LEGEND for P& IDs	TG		II	
12	XXXX-001-110-PVM-B-395	CRANE CLEARANCE DIAGRAM OF TG HALL EOT CRANES			II	
13	XXXX-001-110-PVM-B-416	CRANE CLEARANCE DIAGRAM OF BFP HANDLING EOT CRANE	TG		II	
14	XXXX-110-110-PVM-F-027	P & ID CONDENSATE SYSTEM	TG		II	
15	XXXX-110-110-PVM-F-028	P & ID FEED WATER SYSTEM	TG	I		
16	XXXX-110-110-PVM-F-029	P & ID - HP/LP BYPASS SYSTEM	TG		II	
17	XXXX-110-110-PVM-F-030	P & ID EXTRACTION STEAM SYSTEM FOR HP & LP HEATERS	TG		II	
18	XXXX-110-110-PVM-F-031	P & ID HEATER DRAINS & VENT SYSTEM	TG		II	
19	XXXX-110-110-PVM-F-033	P & ID STEAM DRAINS SYSTEM	TG		II	
20	XXXX-110-110-PVM-F-035	P&ID OF MS, CRH & HRH	TG	I		
21	XXXX-110-110-PVM-F-036	P & ID AND WRITE-UP FOR AUXILIARY STEAM SYSTEM	TG		II	
22	XXXX-110-110-PVM-B-110	GA, CROSS SECTION ARRANGEMENT DRAWING OF STEAM TURBINE & TURBINE CLEARANCE DIAGRAM	TG		II	
23	XXXX-110-110-PVM-N-110	CORRECTION CURVES AS PER SPECIFICATION	TG		II	
24	XXXX-001-999-PGM-F-001	Main Plant Equipment Layout at EL(+/-) 0.0M	Layout	I		
25	XXXX-001-110-PVM-H-008	PIPE SCHEDULE FOR POWER CYCLE PIPING WITH DESIGN PARAMETER CALCULATIONS INCLUDING DM & CT SYSTEM	Piping	I		
26	XXXX-001-102-PVM-U-031	PRESSURE DROP CALCULATION FOR MS,CRH AND HRH PIPING.	Piping	I		
27	XXXX-001-110-PVM-H-007	VALVE SCHEDULE FOR POWER CYCLE PIPING INCLUDING DM WATER SYSTEM	Piping	I		
28	XXXX-001-110-PVM-F-053	MAIN PLANT TG HALL CROSS SECTION	Layout		II	
29	XXXX-001-110-PVM-F-049	TG EQUIPMENT LAYOUT DRAWING AT 0 M	Layout		II	
30	XXXX-001-110-PVM-F-050	TG EQUIPMENT LAYOUT DRAWING AT MEZANINE FLOOR 9 M	Layout		II	
31	XXXX-001-110-PVM-F-051	TG EQUIPMENT LAYOUT DRAWING AT OPERATING GLOOR, 18M	Layout		II	
32	XXXX-001-110-PVM-F-052	TG EQUIPMENT PLAN AT UPPER FLOORS IN B-C BAY	Layout		II	
33	XXXX-110-110-PVM-F-0375A	P&ID - Service water System	Piping		II	
34	XXXX-001-110-PVM-P-050	COMPOSITE CRITICAL PIPING LAYOUT	Piping/Layout		II	
35	XXXX-136-PVM-F-017B	WATER BALANCE DIAGRAM	WS	I		
36	XXXX-133-PVM-F-047	P&ID FOR CW PUMPING SYSTEM (if applicable)	WS		II	
37	XXXX-133-PVM-U-049	SIZING CALCULATION OF CW SYSTEM (If applicable)	WS		II	
38	XXXX-001-110-PVE-V-150E	General arrangement drawing of Generator	Elect		II	
39	XXXX-001-299-PVE-U-001	DESIGN PHILOSOPHY FOR ELECTRICAL EQUIPMENT LAYOUT	Elect		II	
40	XXXX-001-299-PVE-U-007	DESIGN MEMORANDUM FOR GROUNDING SYSTEM	Elect		II	
41	XXXX-001-299-PVE-U-003	DESIGN CALCULATIONS FOR MV/LV CABLES SELECTION & SIZING	Elect			III
42	XXXX-001-299-PVE-U-008	DESIGN MEMORANDUM FOR LIGHTNING PROTECTION SYSTEM	Elect			III
43	XXXX-001-299-PVE-U-010	ELECTRICAL SINGLE LINE DIAGRAM FOR AUXILIARY POWER DISTRIBUT	Elect		II	
44	XXXX-001-299-PVE-U-011	DESIGN CALCULATIONS FOR GENERATOR AND MV SYSTEMS	Elect		II	
45	XXXX-001-299-PVE-U-012	DESIGN CALCULATIONS FOR EMERGENCY SUPPLY DG SIZING	Elect		II	
46	XXXX-001-299-PVE-U-013	DESIGN MEMORANDUM FOR 220V/110V DC STSTEM	Elect		II	
47	XXXX-001-299-PVE-U-009	DESIGN MEMORANDUM FOR LIGHTING SYSTEM	Elect			III
48	XXXX-001-572-PVE-P-0002	765kV Single Line Diagram	Switchyard			III
49	XXXX-001-572-PVE-F-0034	765 kV - Earthmat Layout	Switchyard			III
50	XXXX-001-572-PVE-F-0038	765 kV - Equipment Earthing Philosophy & Details	Switchyard			III
51	XXXX-001-572-PVE-P-0011	SLD of AC/DC DB	Switchyard			III
52	XXXX-001-572-PVE-B-1090	BATTERY SIZING CALCULATION FOR 765kV SWITCHYARD	Switchyard			III
53	XXXX-301C-POC-F-001	General Layout of Plant	CIVIL	I		
54	XXXX-301C-POC-C-107	Layout of Roads	CIVIL		II	
55	XXXX-301C-POC-C-108	Cross Section Details of Roads	CIVIL		II	
56	XXXX-301C-POC-C-111	Layout of Drains	CIVIL		II	
57	XXXX-301C-POC-C-112	Cross Section Details of Drains	CIVIL		II	
58	XXXX-301C-POC-U-107	Design Calculation for Road	CIVIL		II	
59	XXXX-301C-POC-C-101	Site Levelling Works - Plan & Sections	CIVIL		II	
60	XXXX-301-PVC-C-00	Geotechnical Investigation Scheme	CIVIL		II	
61	XXXX-301C-POC-C-113	Layout of Culverts	CIVIL		II	
62	XXXX-301C-POC-C-114	Details of Culverts	CIVIL		II	
63	XXXX-301C-POC-U-111	Design Calculation for Drain	CIVIL		II	
64	XXXX-301C-POC-U-114	Design Calculation for Culvert	CIVIL		II	
65	XXXX-001-315-PVC-C-0451B	GENERAL NOTES & STD. DETAILS FOR CIVIL WORKS	CIVIL		II	
66	XXXX-001-315-PVC-C-0089A	GENERAL NOTES FOR STRUCTURAL STEEL WORKS	CIVIL		II	
67	XXXX-001-XXX-XXX-X-XXX	Design and drawings of Safety Control room	CIVIL		II	
68	XXXX-001-XXX-XXX-X-XXX	Design and drawings of Safety Park building	CIVIL		II	
69	XXXX-001-XXX-XXX-X-XXX	Design and drawings of Sheds for Construction workers and O&M Workers	CIVIL		II	
70	XXXX-301-PVC-C-00	Geotechnical Investigation Report and Recommendations	CIVIL			III
71	XXXX-001-315-PVC-C-0003A	MPH BUILDING - LAYOUT & DETAILS OF BASE PLATE UNIT-1	CIVIL			III

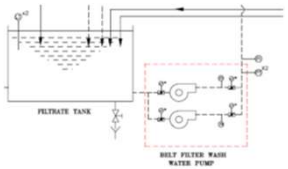
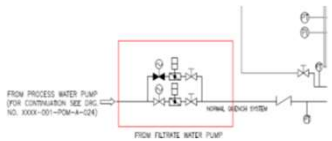
72	XXXX-001-315-PVC-C-0004	MPH BUILDING - STRUCTURAL FRAMING & COLUMN DETAILS ALONG A ROW INCLUDING CONDUCTOR ANCHORAGE & BUS DUCT SUPPORTING STRUCTURE BRACKETS UNIT-1	CIVIL			III
73	XXXX-001-315-PVC-C-0007	MPH BUILDING - STRUCTURAL FRAMING & COLUMN DETAILS ALONG B ROW UNIT-1	CIVIL			III
74	XXXX-001-315-PVC-C-0010	MPH BUILDING - STRUCTURAL FRAMING & COLUMN DETAILS ALONG C ROW UNIT-1	CIVIL			III
75	XXXX-001-315-PVC-C-0454A	MPH BUILDING - G.A. & R.C. OF COLS FDN ON ROW A to F UNIT-1	CIVIL			III
76	XXXX-001-315-PVC-U-0003B	MPH BLDG. - UNIT-1 ANALYSIS AND DESIGN OF MAIN FRAME	CIVIL			III
77	XXXX-001-315-PVC-C-0454D	MPH BUILDING - G.A. & R.C. DTLS OF INTERMEDIATE COLS. (AB BAY) FDN UNIT-1	CIVIL			III
78	XXXX-001-315-PVC-C-0301	T.G. FDN -GA OF RAFT	CIVIL			III
79	XXXX-001-315-PVC-C-0302	R/F DETAIL OF TG RAFT AND COLUMNS	CIVIL			III
80	XXXX-001-315-PVC-U-1680	T.G. FOUNDATION : STATIC ANALYSIS	CIVIL			III
81	XXXX-001-315-PVC-U-1681	T.G. FOUNDATION : DESIGN OF T.G. DECK GIRDERS	CIVIL			III
82	XXXX-001-315-PVC-U-0452A	DESIGN OF INTEGRATED BOILER FOUNDATION - UNIT 1	CIVIL			III
83	XXXX-001-315-PVC-C-0452A	G.A. OF BOILER FOUNDATIONS AND PEDESTALS- UNIT-1	CIVIL			III
84	XXXX-001-315-PVC-C-0452B	R.C. DETAILS OF BOILER FOUNDATIONS AND PEDESTALS - UNIT-1	CIVIL			III
85	XXXX-001-315-PVC-U-0452C	DESIGN OF BUNKER BUILDING FOUNDATIONS AND PEDESTALS - UNIT-1	CIVIL			III
86	XXXX-001-315-PVC-C-0452C	G.A. & R.C. DETAILS OF BUNKER BUILDING FOUNDATIONS AND PEDESTALS - UNIT-1	CIVIL			III
87	XXXX-001-315-PVC-U-0401A	DESIGN OF BOWL MILL FOUNDATION	CIVIL			III
88	XXXX-001-315-PVC-C-0401A	BOWL MILL FOUNDATION - GA DETAILS	CIVIL			III
89	XXXX-001-315-PVC-C-0401B	BOWL MILL FOUNDATION - RCC DETAILS	CIVIL			III
90	XXXX-001-315-PVC-U-0453A	DESIGN OF ESP FOUNDATIONS - UNIT-1	CIVIL			III
91	XXXX-001-315-PVC-C-0453A	G.A. OF ESP FOUNDATIONS - UNIT-1	CIVIL			III
92	XXXX-001-315-PVC-C-0453B	R.C. DETAILS OF ESP FOUNDATIONS - UNIT-1	CIVIL			III
93	XXXX-109-PVC-B-101	FGD Wet Stack-General Arrangement of Wet Stack	CIVIL			III
94	XXXX-109-PVC-B-102	FGD Wet Stack- Foundation Details including shell dowels & duct pedestals	CIVIL			III
95	XXXX-109-PVC-U-102	FGD Wet Stack-Analysis and design of foundation	CIVIL			III
96	XXXX-109-PVC-U-103	FGD Wet Stack-Analysis & design of RCC shell,platforms and extra reinforcement around platform beam recess and other miscellaneous openings	CIVIL			III
97	XXXX-001-102-PVM-U-001	Furnace performance & sizing criteria & calculation	SG	I		
98	XXXX-001-102-PVM-U-002	BOILER HEAT DUTY CALCULATION	SG	I		
99	XXXX-001-102-PVM-U-004	Duct design data & calculation	SG	I		
100	XXXX-001-102-PVM-U-006	Boiler efficiency calculation	SG	I		
101	XXXX-001-102-PVM-U-008	Furnace Residence Time calculation	SG	I		
102	XXXX-001-102-PVM-U-009	NOX CALCULATION	SG	I		
103	XXXX-001-102-PVM-W-010	BOILER PERFORMANCE PARAMETER	SG	I		
104	XXXX-001-102-PVM-W-011	Predicted performance for indigeneous best coal, design coal & worst coal and variable pressure operation for 50,60,80, & 100% TMCR load and 60% BMCR & 100% BMCR load and HP heaters out condition	SG	I		
105	XXXX-001-102-PVM-W-012	Predicted performance for best coal, design coal & worst indigeneous coal blended with best & worst imported coal (individually) for variable pressure operation for 100% and 105% TMCR load and 60% BMCR & 100% BMCR load and HP heaters out condition	SG	I		
106	XXXX-001-102-PVM-U-003	AIR AND GAS WEIGHT CALCULATION	SG	I		
107	XXXX-001-102-PVM-U-005	Circulation calculation	SG	I		
108	XXXX-001-102-PVM-U-010	Buckstay arrangement and sizing calculations	SG	I		
109	XXXX-001-102-PVM-U-015	Coal drying calculations	SG	I		
110	XXXX-001-102-PVM-U-016	Fuel piping sizing data	SG	I		
111	XXXX-001-102-PVM-U-017	Fuel oil system sizing calculations including pressure drop calculations, NPSH, drain oil system etc.	SG	I		
112	XXXX-001-102-PVM-U-018	Mill Sizing Calculation & Performance Curves	SG	I		
113	XXXX-001-102-PVM-U-025	APH sizing calculation	SG	I		
114	XXXX-001-102-PVM-W-010	BOILER PERFORMANCE PARAMETER	SG	I		
115	XXXX-001-102-PVM-U-020	Fan (ID,FD,PA and Seal Air) sizing calculation	SG	I		
116	XXXX-001-102-PVM-U-026	Steam coil Air heater selection data	SG	I		
117	XXXX-001-102-PVM-U-013A	Safety valve and ERV sizing & selection for SH, RH	SG	I		
118	XXXX-001-102-PVM-B-007	GEN. ARRG'T OF BOILER-PLAN-	SG		II	
119	XXXX-001-102-PVM-B-007A	GEN. ARRG'T OF BOILER-PLAN-"C-C'	SG		II	
120	XXXX-001-102-PVM-B-011A	GEN. ARRG'T OF BOILER-FRONT ELEVATION-	SG		II	
121	XXXX-001-102-PVM-B-012	GEN. ARRG'T OF BOILER-FRONT ELEVATION-"G-G"	SG		II	
122		GEN. ARRG'T OF BOILER-SECTIONAL SIDE ELEVATION	SG		II	
123	XXXX-001-102-PVM-B-008	BOILER PLAN AT 0.0M LEVEL	SG		II	
124	XXXX-001-102-PVM-F-010A	GEN. ARRG'T-DUCT LAYOUT-COLD PRI. AIR DUCT TO APH & MILLS	SG		II	
125	XXXX-001-102-PVM-F-010B	GEN. ARRG'T-DUCT LAYOUT-COLD SEC. AIR DUCT TO APH	SG		II	
126	XXXX-001-102-PVM-F-011A	GEN. ARRG'T-DUCT LAYOUT-HOT PRI. AIR DUCT TO MILLS	SG		II	
127	XXXX-001-102-PVM-F-011B	GEN. ARRG'T-DUCT LAYOUT-HOT SEC. AIR DUCT TO WINDBOX CONN. DUCT	SG		II	
128	XXXX-001-102-PVM-F-011C	GEN. ARRG'T-DUCT LAYOUT-HOT SEC. AIR DUCT TO SOFA-	SG		II	
129	XXXX-001-102-PVM-F-012A	GEN. ARRG'T-DUCT LAYOUT-GAS DUCT FROM ECO. DUCT TO APH	SG		II	
130	XXXX-001-102-PVM-F-012B	GEN. ARRG'T-DUCT LAYOUT-GAS DUCT FROM APH TO BOF	SG		II	
131	XXXX-001-102-PVM-F-001	P & I Diagram for Water and steam circuit with valves, Fittings and Instrumentation	SG		II	
132	XXXX-001-102-PVM-F-002	P & I Diagram for flue gas path with instrumentation	SG		II	
133	XXXX-001-102-PVM-F-003	P & I diagram for fuel oil system	SG		II	

134	XXXX-001-102-PVM-L-004	P&ID of fuel oil system in FOPH area from terminal point including write-up/ procedure	SG		II	
135	XXXX-001-102-PVM-L-006	P&ID of Fuel oil system in Boiler front area	SG		II	
136	XXXX-001-102-PVM-L-007	Scheme of Air Heater(s) with instrumentation	SG		II	
137	XXXX-001-102-PVM-L-010	P&ID of pulveriser system	SG		II	
138	XXXX-001-102-PVM-L-022	P&ID High Pressure Boiler Startup and Warmup System	SG		II	
139	XXXX-001-102-PVM-L-025	P&ID Sootblower System	SG		II	
140	XXXX-001-102-PVM-L-036A	P&ID OF Reheater System	SG		II	
141	XXXX-001-102-PVM-L-036C	P&ID OF SuperHeater System	SG		II	
142	XXXX-001-102-PVM-L-036G	P&ID OF Evaparator System	SG		II	
143	XXXX-001-102-PVM-L-036H	P&ID OF Water Separator System	SG		II	
144	XXXX-001-102-PVM-L-036J	P&ID OF Economiser System	SG		II	
145	XXXX-001-102-PVM-L-041	P&ID for Boiler Water Circulation Pump System	SG		II	
146	XXXX-001-102-PVM-L-208	P&ID for Oxygen Dosing System	SG		II	
147	XXXX-001-102-PVM-L-003	Combustion air & Flue gas system along with instrumentation - Write up /Procedure	SG	I		
148	XXXX-001-102-PVM-H-002	Pressure part schedule along with summary of pr drop for SH system, RH system , Eco system, seperator , Circulation system/ evaporator system	SG	I		
149	XXXX-001-102-PVM-B-032	Pressure parts arrangement	SG		II	
150	XXXX-001-102-PVM-W-037	Soot blower selection sheets	SG	I		
151	XXXX-001-102-PVM-Y-001	Oil/Coal Burner data	SG	I		
152	XXXX-001-102-PVM-W-029	Pressure parts expansion movement diagram	SG		II	
153	XXXX-001-104-PVM-U-001	ESP sizing selection data	SG	I		
154	XXXX-001-104-PVM-U-XXX	FGD sizing selection Criteria	SG	I		
155	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for EOT crane for TG Hall		II		
156	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for IDCT (if applicable)			III	
157	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for Air Cooled Condenser (if applicable)			III	
158	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for FGD		II		
159	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for Generator Transformer		II		
160	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for Unit Transformer		II		
161	XXXX-001-XXX-XXX-X-XXX	Sub-Vendor approval for Station transformer		II		

Errata-01B to Amendment to Technical Specifications (Section VI) of Sipat-III EPC Package

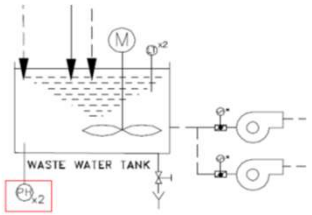
SN	Reference Amendment	Existing	To be read as
Errata-1.	Amendment no. 2B, SN: EE-04B	Section VI, Part A, Sub Section VI (Mandatory Spares), Chapter 01 SG & Auxiliaries, Page 20 of 38, Clause no: 1.22.06 (2) Thyristor bridge leg: 1 set (complete qty for one phase)	Section VI, Part A, Sub Section VI (Mandatory Spares), Chapter 01 SG & Auxiliaries, **Page 24 of 41, Clause no: 1.22.06 A (2)** Thyristor bridge leg: 1 set (complete qty for one phase)

CLARIFICATION 01A FOR Darlipali STPP, Stage-II (1X800 MW) EPC PACKAGE (BULK TENDER)

SL. NO	ENQUIRY SPECIFICATION				SPECIFICATION REQUIREMENT	COMMENTS / CLARIFICATIONS	Employer's Response
	SEC/ PART	SUBSEC.	PAGE NO.	CLAUSE NO.			
1	VI / A		26 of 44	4.26.1 4.26.2	1. If qualification sought as per clause 4.26.1 then the details of the sub vendor (manufacturer) shall be filled by the bidder in the format A to G. 2. If the qualification sought as per the clause 4.26.2, then the details of JV/Subsidiary Company formed for manufacturing of such equipments in India shall be furnished individually for each equipment by the bidder such as	We are public sector company. We conduct open tender process with NTPC QR condition for procurement of FGD BOI. Therefore, Attachment 3K, which pertains to FGD BOI components such as Agitators, Slurry Recirculation Pumps, etc., will be submitted after the award of the contract. Please accept.	The Attachment 3K for provenness of the identified equipment suppliers is to be submitted as as per the schedule identified in the bidding documents. Bidder to comply with the requirements of the technical specification.
2	VI / A		26 of 44	4.26.1 4.26.2	The Bidder / Bidder's sub-vendor(s) is required to meet the provenness criteria and/or qualification requirement for critical equipment, auxiliaries, system and bought out items as per criteria stipulated below: Slurry Recirculation Pumps, Oxidation Blowers, Wet Limestone Grinding Mills, Slurry Pumps, Agitators & Vacuum Belt Filters for the Wet Limestone based Flue Gas Desulphurisation (FGD) System offered by the Bidder shall be only from such manufacturer(s) who has previously designed (either by itself or under collaboration / licensing agreement), manufactured / got manufactured the respective equipment(s) of the type, application and minimum equipment rating as stipulated below such that the respective equipment(s) should have been in successful operation in at least one (1) plant for a period not less than one(1) year:	**MODIFIED QUALIFICATION REQUIREMENT:** **AGITATOR:** Bidder should have designed, manufactured, tested, supplied / commissioned at least 1 No. of Horizontal or Side Entry Agitator in either for Wet Limestone based Flue Gas Desulphurization (FGD) application or any other industrial / process application such as petrochemicals, metals, mining, sugar, paper, fertilizers etc. and the equipment should have been in successful operation in at least one (1) plant for a period not less than one(1) year reckoned as on the date of consideration for approval but not later than one (1) year to award date of contract". **SLURRY PUMPS:** Bidder should have designed, manufactured, tested, supplied / commissioned at least 1 No. of Slurry pump having Flow 50 m3/hr (min.) with head 30 Meters of Liquid Column (min.) in either for Wet limestone based Flue Gas Desulphurization (FGD) application or Ash Slurry Application or any other industrial / process application and the equipment should have been in successful operation in at least one (1) plant for a period not less than one(1) year reckoned as on the date of consideration for approval but not later than one (1) year to award date of contract.	Bidder's proposal is not acceptable. Bidder to comply with the specification requirements.
3	VI / E	Tender Drawing	26 of 70	-	Tender Drg. No. xxxx-001-POM-A-024 (zone A7) Scheme of Gypsum Dewatering System 	In the tender drawing, it is observed that the belt filter wash water pump is drawing its suction from the filtrate tank. However, the filtrate tank contains slurry with solids, making the filtrate water unsuitable for belt filter washing. Hence, as per our proven practise, process water will be used for Belt filter wasing. Please confirm.	The Bidder may use process water for belt filter wash water. However, equipments like tank, pumps, valves and instrumentation shall be provided as the specification requirememt
4	VI / E	Tender Drawing	24 of 70		Tender Drg. No. xxxx-001-POM-A-022 (zone D8) Scheme of FGD Absorber System 	In tender drawing, normal quench system is shown. Howvever, in tender specification, there is no mentioning of normal quench system. As per our collaborator proven FGD design also, normal quench system is not applicable. Kindly clarify what is the purpose of normal quench system and if it is mandatorily required, kindly provide the specification for the same.	The scheme for the normal quenching system is used for washing the wet-dry duct interface to prevent scaling in the zone. The requirements of the scheme are indicated in the tender P&ID. The same is to be complied with by the Bidder.

5	VI / E	Tender Drawing	24 of 70		Scheme of FGD-Absorber system: Note 6- All instruments in slurry lines shall be provided isolation valves and diaphragm.	Bidder does not recommend valves in the impulse lines of slurry pipes in order to keep the stub length as minimum as possible and to prevent slurry settlement/blockage issues. Bidder request NTPC to review and confirm.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
6	VI / A	IB	14 of 18	4	The above represent limestone quality to be considered for basic sizing and guarantees. Further the bidder is required to collect limestone samples from site for analysing is characteristic including reactivity. Bidder shall indicate in its bid the quantity of limestone required for such testing.	Kindly clarify whether limestone reactivity test is to be carried out after award of contract or before award of contract.	The specification requirement is clear in this regard. The scheduling of the limestone reactivity is based on the assessment by the Bidder of the sensitivity of the Bidder's offered FGD design to the FGD reactivity, design margins required etc. while meeting the requirments of the bidding documents.
7	VI / A	IIA-04	1 of 7	1.02.00	In case of higher pressure /flow requirements are envisaged for instrument & service air and water Contractor shall make its own arrangement.	As per this clause, we understand instrument air & service air will be provided by customer upto certain predefined limit. Kindly specify the ceiling limit for instrument & service air.	BIdder's understanding is not correct. The complete compressed air system for the EPC package is in the scope of the Bidder.
8	VI / A	IIA-04	2 of 7	2.06.00	The waste water from the system shall be collected and neutralized using lime and shall be pumped to FGD waste water treatment plant or in any other area with suitable treatment so as to suit/not disturb the destination fluid quality.	Kindly specify a. type of treament required for FGD waste water and b. quality of waste water required after treament so as to bring uniformity among bidders	Bidder to refer clause 1.03.06 of sub section IIA-10, Part A & clause 3.12.00 of sub section A-14, Part B of Section VI for FGD wastewater treatment system in case of Dry Ash handling system. In other cases, bidder to suitably treat the FGD wastewater for reuse in Ash handling / dust suppression system. The functional requirement of the treatment is already specified. The details of the same shall be finalised based on the location to which the neutralised waster water is sought to be pumped.
9	VI / A	IIA-04	3 of 7	4.01.04	2x100 heaters for absorber outlet gate & **bypass gate**	We understand that FGD bypass gate is not applicable. The reference to the bypass gate in this clause is a typographical error. Please confirm.	The referred specification requirement is not from Darlipali II. Bidder to check.
10	VI / A	IIA-04	3 of 7	4.01.09	Piping from gypsum bleed pumps to gypsum dewatering system, along with recirculation lines (if required) necessary isolation and **control valves**	Control valve is not required in gypsum bleed pump line as per our proven practise. All valves (as per tender P&ID) will be provided for gypsum bleed pump line. Please accept. If control valve is mandatory in gypsum bleed pump line, please inform the purpose of control valve and type of control valve required.	Bidder's proposal is not acceptable. Bidder to comply with the specification requirements.
11	VI / A	IIA-04	5 of 7	7.00.00	PROCESS WATER& COOLING WATER STORAGE & PUMPING SCHEME	This section does not stipulate any specific requirement for cooling water storage. Kindly confirm whether cooling water stoarge is required. If cooling water storage is required, provide specification for cooling water stoarge if required.	Bidder to follow the water storage requirements along with the pumping scheme as detailed in the technical specifications.
12	VI / A	IV	1 of 77	1.00.01	All CAT-1 Performance Guarantee tests shall be conducted along with initial operation except following a) Coal Pulverisor Wear Parts Warranty b) Particulate Emission/ESP Efficiency, **FGD.**	Kindly specify when FGD PG test is to be done. Is it after completion of initial operation?	The PG test of the FGD shall be carried out during the initial operation or soon after the completion of the initial operation. The Contractor shall make the FGD system ready for conducting the functional guarantee tests in line with the requirements laid out in the bidding documents.
13	VI / A	IV	21 of 77	1.01.07.01 note 5	Guaranteed Unit Auxiliary Power Consumption of FGD system shall be taken by considering the additional pressure drop in the FGD system during FGD SO2 removal efficiency test at specified guarantee point conditions. For this purpose, difference of FGD system pressure drop during FGD SO2 removal efficiency test and that at Unit Auxiliary Power Consumption test shall be loaded as additional Auxiliary Power Consumption.	We understand that if booster fan is not provided, difference in ID fan power consumption measured during FGD SO2 removal efficiency test and that measured during Unit Auxiliary Power Consumption Test will be considered for FGD Power Consumption on account of FGD pressure loss. If booster fan is provided, booster fan power consumption only will be considered for FGD power consumption on account of FGD pressure loss. Kindly confirm our understanding is right.	The requirement of the specification is clear in this regard. Bidder to comply with the specification requirement.

14	VI / A	IV	22 of 77	1.01.07.02 c)	c) FGD System i.Not used ii. Vacuum Belt Filter, Vacuum Pump and its integral auxiliaries iii. Booster water pump iv. Waste water pump v. Limestone Slurry Tank Agitators vi. Filtrate Pump(s) vii. Belt Filter Wash Water Pump viii. Hydro-cyclone Waste Water Sump Pump and Waste Water Pump	Wet Ball Mill System and Gypsum Dewatering System along with their associated equipment do not run continuously and are operated in batch mode. As per ASME PTC 40, Bidder calculates duty factors based on running time of equipment at guarantee point conditions and accordingly guaranteed auxiliary power will be furnished. Please accept. Otherwise NTPC is requested to specify duty factors for equipment indicated at sl. no. i to viii.	The formulation of duty factors for limestone grinding system and gypsum dewatering system shall be finalised during detail engineering and shall consider correction of the Auxiliary Power Consumption values measured during the Performance Guarantee Test to the guaranteed conditions.
15	VI / A	IV	22 of 77	1.01.07.02 c)	c) FGD System viii. **Hydro-cyclone Waste Water Sump Pump** and Waste Water Pump	The name of this pump (Hydro-cyclone Waste Water Sump Pump) is ambiguous, and we are unable to understand its intended purpose or service. We kindly request clarification	Bidder to Refer Amendment No. SG7
16	VI / A	IV	31 of 77	1.03.03 iv)	Pressure Drop across FGD The contractor shall demonstrate that the total pressure drop in the gas path across the FGD System shall not exceed the guaranteed values for the range of coal and loads specified in the Technical Specification	FGD pressure drop is directly related to power consumption of ID fan or booster fanas the case may be. There is guarantee for Auxiliary Power Consumption envisaged in the tender. FGD pressure drop is already accounted in auxiliary power cosumption guarantee. Hence, we request NTPC to remove FGD pressure drop guarantee for this project in line with other NTPC tenders.	The requirement of the specification is clear in this regard. Bidder to comply with the specification requirement.
17	VI / A	IV	31 of 77	1.03.03 vii)	The Contractor guarantees that the maximum purge flow rate to waste water treatment system from FGD system for 1x800 MW unit shall be less than **10m3/h** averaged over a 24 hour period for a the range of specified coal(s).	FGD waste water purge flow quantity is arrived to limit chloride content in absorber slurry < 20000 ppm. Source of chloride in absorber slurry is mainly from coal. Kindly provide coal chloride content to check adequacy of FGD waste water purge flow quantity.	For FGD design and guarantee conditions-HCL (ppm) wet-45 & HF (ppm) wet-12 may be considered. Bidder to Refer Amendment No. SG3 and further, Bidder to comply with the specification requirement.
18	VI / A	IV	31 of 77	1.03.03 vii)	The Contractor guarantees that the maximum purge flow rate to waste water treatment system from FGD system for 1x800 MW unit shall be less than **10m3/h** averaged over a 24 hour period for a the range of specified coal(s).	FGD waste water purge flow of 10 m3/hr is too less for 1x800 MW unit. Bidder recommends that atleast 15 m3/hr waste water purge flow per unit otherwise it will result in accumulation of high TDS/chloride content in the recirculated slurry which will impact FGD performance. NTPC is requested to review the clarification and provide necessary amendments.	Bidder's proposal is not acceptable. Bidder to comply technical specification requirement.
19	VI / B	A-01	17 of 88	3 viii)	Pressure drop through FGD System 150mm WC or actual whichever is higher (Alternately, separate booster fans for FGD system may be provided. if pressure drop through FGD system exceeds 150 mm WC. In such case, specified pressure drop through FGD system shall not be considered for sizing of ID fan.)	We understand that separate booster is not mandatory even if FGD pressure drop is more than 150 mmwc. ID fan taking care of FGD pressure drop will be provided. Please confirm our understanding is correct.	Bidder's understanding is correct.
20	VI / B	A-05	7 of 27	iv)	The slurry recirculation pumps shall have motor /pneumatic driven knife gate valve at pump suction.	Based on the proven practices of our collaborators, it is highly advisable to install a pneumatic butterfly valve at the suction point of the slurry recirculation pumps. Knife gate valves have a longer opening and closing time, approximately 5 minutes, in comparison to butterfly valves(15 sec). If a knife gate valve is used at the pump suction, it may cause delays in starting the recirculation pump, as one would have to wait until the suction gate valve is fully open. Please accept pneumatic butterfly valve at the suction point of the slurry recirculation pumps.	Bidder's proposal is not acceptable. Bidder to comply technical specification requirement.
21	VI / B	A-05	9 of 27	5.04.00	Provision shall also be provide in the Gypsum Bleed Pumping system by provision of tap off, valves etc. for pumping the gypsum bleed to alternate source.	We understand that only provision for tap off with isolation valve will be provided in gypsum bleed pump discharge header pipe. Piping from tap off to alternate destination is not in bidder's scope. Please confirm.	Bidder's understanding is correct.
22	VI / B	A-05	4 of 27	2.00.00	The complete installation of liners shall be made under the supervision of the liner supplier as per their guidelines.	Since absorber is made of C276 clad plate, no liner is applicable. Hence, clause related to "supervision of the liner supplier" may be deleted.	The requirement of the specification is clear in this regard. Bidder to comply with the specification requirement. The referred clause refers to the liners

23	VI / B	A-05	17 of 27	7.07.05	In case Bidder opts to provide additionally Lamella separator before the waste water tank and after the secondary hydro cyclone for removing impurities from the system, the solids con-centration in waste water up to max 10% can be acceptable.	Kindly clarify whether Lamella separator (before the waste water tank and after the secondary hydro cyclone) is mandatory or not.	The requirement of the specification is clear in this regard. Bidder to comply with the specification requirement.
24	VI / B	A-05	17 of 27	7.07.07	A pH monitor shall be provided at the discharge of the pumps for measurement and control.	As per Part B, pH analyser to be provided at discharge of the waste water pump. As per Tender drawing, ph analyser to be provided in waste water tank. Both clauses are contradictory. As per our proven practise, ph analyser will be provided in waste water tank. Please confirm.	Bidder's understanding is correct. Refer to Amendment C-01 in this regard.
25	VI / E	Tender Drawing	26 of 70	-	Tender Drg. No. xxxx-001-POM-A-024 (zone F3) Scheme of Gypsum Dewatering System 		
26	VI / B	A-05	18 of 27	7.08.01	Bidder to provide the portable pumps of suitable capacity to drain the remaining slurry from the tank in max 2 hour into absorber area sump.	As per our proven practise, by opening drain valves in absorber, remaining slurry in absorber will flow automatically by gravity to absorber area sump via trench within 2hrs. Portable pumps to drain absorber tank is therefore not required. Please confirm.	Bidder's proposal is not acceptable. The specification requirement is clear in this regard. Bidder to comply with technical specification requirements.
27	VI / B	A-05	19 of 27	8.04.00	All the slurry pumps shall be provided with motorized suction and discharge valves.	As per Part B, All the slurry pumps to be provided with motorized suction and discharge valves. However, the tender drawings allow for the provision of pneumatic valves based on the proven practices of the bidder for slurry pump suction/discharge. as per our proven practise, we will provide pneumatic valves for slurry pump suction/discharge. Please confirm.	The requirement of the specification is clear in this regard. Bidder to comply with the specification requirement.
28	VI / B	A-05	19 of 27	9.01.00	Contractor shall make arrangements for pumping the drainage water back to the respective system with 2x100% vertical sump pumps.	As per referred clause, 2x100% sump pumps to be provided. However, in tender drawings, only one no. sump pump is shown for each of the respective sumps. Both are contradictory. Kindly clarify.	Bidder to provide 2x100% sump pumps as per the specification requirement in the referred clause
29	VI / B	A-05	20 of 27	10.01.00	Slurry tanks: Replaceable Chlorobutyl/Bromobutyl rubber lining of minimum 5 mm thickness	We interpret that the lining material and lining thickness for slurry tanks, such as the limestone slurry tank, wastewater tank, filtrate tank, and secondary hydrocyclone feed tank, should conform to the specifications provided in their respective sections or headings. The lining material and lining thickness details mentioned in this clause are intended for other slurry tanks for which such specifics are not explicitly stated.	The specification requirement is clear in this regard. Bidder to comply with the specification requirement.
30	VI / B	A-05	20 of 27	10.01.00	Coarse-screen(s) at suction-side of slurry recirculation pumps shall be provided	Both clauses are contradictory. As per our proven practise, Suction screens shall be installed inside the Absorber vessel to protect the Slurry recirculation pumps. Please confirm.	The requirements of the specification are clear. Bidder to provide the screens in the locations as specified in the referred clauses.
31	VI / B	A-05	12 of 27	5.06.22	Suction screens shall be installed inside the Absorber vessel to protect the Slurry recirculation pumps.		
32	VI / B	A-05	23 of 27	14.03.00	An adequately sized manhole with platform (min. 2 sq. m) shall be provided above each spray level	Manhole size (min. 2 sq.m) asked in tender is very large and there is a risk of fall asscoiated with larger manhole. As per our proven practise, manhole of size 600 x 900 mm is adequate and will be provided above spray level. Please accept.	The specification requirement is clear in this regard. The larger size of the manhole provides for easing mobility and, hence, safety. The Bidder is to make necessary system improvements to nullify the risk cited by the Bidder in its clarification. Bidder to comply with the specification requirement.
33	VI / B	A-02	40 of 67	13.01.02 c	For flue gas ducts downstream of ESP, additional fly ash loading on the surface or for one tenth of duct full of ash or for maximum possible accumulation of ash in the ductwork, under	Kindly provide additional fly ash loading for absorber outlet duct upto bypass duct.	The requirement of fly ash loading to be considered for duct design, as specified in the referred clause, is also applicable for absorber inlet and absorber outlet duct sections.

34	VI / B	A-01	20 of 88	1.05.14.01 a 3	Maximum Flue gas velocity from ESP out-let to chimney inlet shall be 15 m/sec.	We understand that maximum Flue gas Velocity for Absorber inlet duct and absorber outlet shall be 15 m/s. Please confirm.	Bidder's understanding is correct.
35	VI / A	IIA-04	3 of 7	3.01.05	On/Off type Diaphragm valves in Limestone circulation lines to be provided instead of pinch control valve.	Similar to limestone recirculation line, on/off type Diaphragm valves shall be provided in gypsum bleed pump recirculation line instead of pinch control valve. Please accept. Note. There is no requirement of control valve in recirulation line as per our proven design.	Bidder's query is not clear. The referred specification requirement as per cl. no. 3.01.05 may be checked. Specification requirement is clear. Bidder to comply with the specification requiremnets..
36	VI / B	A-05	4 of 27	3.01.00	5. Maximum flue gas velocity through the Absorber (M/sec) - Not more than 4 m/s at Design Point Conditions (not applicable for bubbling type absorber)	Gas Velocity inside the Absorber are design specific parameter and as per our DCFS FGD standard design practice, maximum flue gas velocity through the Absorber is maintained at 4.5m/s. Bidder request NTPC to review and kindly accept.	Bidder's proposal is not acceptable. The specification requirement is clear in this regard. Bidder to comply with technical specification requirements.
37	VI / B	A-01	26 of 88	1.05.21.01	7. SO2 Removal Efficiency **Guarantee Point** To be worked out by the Bidder to achieve SO2 emission in the chimney to less than 60 mg/nm3 (6% O2 dry basis) **Design Point** To be worked out by the Bidder to achieve SO2 emission in the chimney to less than 80 mg/Nm3 (6% O2 dry basis)	Bidder proposes the following Outlet SO2 limits 1.Guarantee Point : 80 mg/Nm3 (6% O2 dry basis) 2.Design Point : 90 mg/Nm3 (6% O2 dry basis) The above mentioned SO2 emission limits are below the Emission norms and it will ensure optimized FGD design. Bidder request NTPC to review and kindly accept the proposal.	Bidder's proposal is not acceptable. The specification requirement is clear in this regard. Bidder to comply with technical specification requirements.
38	VI / B	A-05	11 of 29	5.06.11	The complete absorber vessel (absorber oxidation tank, absorber tower & absorber outlet duct upto absorber outlet flange) shall be made of clad sheet of C276 / Alloy 59 (minimum 2 mm thickness) by explosion bonding or hot rolling, having minimum 7 mm thick carbon steel as base material.	Glass flake lining is the preferred material for FGD absorber linings worldwide owing to its inherent advantages. Our collaborator, MHI Japan, widely recommends the use of Glass Flake Resin Lining in absorber, citing its ease of application and maintenance. MHI Japan has successfully executed over 80% of their supplied absorbers with Resin Lined Carbon Steel globally. Glass Flake Resin Lining is a cost-effective alternative to alloy material, providing substantial savings in both material and installation costs. This alternative can significantly reduce the overall project budget. Glass Flake Resin Lining offers exceptional resistance to a wide range of corrosive chemicals and temperature conditions typically found in FGD systems. It can withstand the high corrosive/abrasive environment effectively, ensuring a longer service life for FGD. In view of the above, we request NTPC to review and accept 3 mm thickness vinyl ester based glass flake lining for absorber.	Bidder's proposal is not acceptable. The specification requirement is clear in this regard. Bidder to comply with technical specification requirements.
39	VI / B	A-05	5 of 27	3.02.04	Absorber outlet to bypass duct & duct after by pass damper/gate to chimney inlet shall be made of cladded sheet of minimum 2 mm thickness of either Titanium (Grade 2 as per ASME SB265) or C-276 over 7 mm thick (minimum) mild steel base metal	Glass Flake Resin Lining offers exceptional resistance to a wide range of corrosive chemicals and temperature conditions typically found in absorber outlet duct. It can withstand the high corrosive/abrasive environment effectively, ensuring a longer service life for FGD ducts. In view of the above, we request NTPC to review and accept 2 mm thickness vinyl ester based glass flake lining for absorber outlet duct in line with NTPC Dadri FGD.	Bidder's proposal is not acceptable. The specification requirement is clear in this regard. Bidder to comply with technical specification requirements.
40	SECTION – VI, PART-A BID DOC. NO. CS-9551-001-2	SUB-SECTION-VI CHAPTER -01 SG & AUXILIARIES	5 OF 41	1.05.00 / A.6.3	**ID Fans** Pressure Regulator : 3 nos. of each type	Pressure Regulator is not applicable. We are offering PRV instead of Pressure regulator which is already quoted in 1.05.00/A.6.4. Hence,we request NTPC to amend the item as "**if applicable**".	Bidder to supply the item as specified, based on the bidder's offered type/design of the fan, which shall be discussed during detail engineering. Further Bidder to please also refer provisions specified in Mandatory spare chapter sub-section-VI, Part-A/section-VI.

41	SECTION – VI, PART-A BID DOC. NO. CS-9551-001-2	SUB-SECTION-VI CHAPTER -01 SG & AUXILIARIES	6 OF 41	1.05.00 / B.4.3	**FD Fans** Pressure Regulator : 4 nos. of each type	Pressure Regulator is not applicable for ID LOS. We are offering PRV instead of Pressure regulator which is already quoted in 1.05.00/A.4.4. Hence ,we request NTPC to amend the item as "**if applicable**".	Bidder to supply the item as specified, based on the bidder's offered type/design of the fan, which shall be discussed during detail engineering. Further Bidder to please also refer provisions specified in Mandatory spare chapter sub-section-VI, Part-A/section-VI.
42	SECTION – VI, PART-A BID DOC. NO. CS-9551-001-2	SUB-SECTION-VI CHAPTER -01 SG & AUXILIARIES	7 OF 41	1.05.00 / C.6.3	**PA Fans** Pressure Regulator : 4 nos. of each type	Pressure Regulator is not applicable. We are offering PRV instead of Pressure regulator which is already quoted in 1.05.00/A.6.4. Hence,we request NTPC to amend the item as "**if applicable**".	Bidder to supply the item as specified, based on the bidder's offered type/design of the fan, which shall be discussed during detail engineering. Further Bidder to please also refer provisions specified in Mandatory spare chapter sub-section-VI, Part-A/section-VI.
43	Section-VI, Part A	Sub-Section- II A-01 (SG & Auxiliaries including ESP)	Page 27 of 28	5.00.00	**5.00.00. Provision for CO2 to Methanol in Darlipalli STPP Stage-II 1 x 800 MW Project** …. Provisions shall be given in both the units. The tap-off duct portion shall be provided with necessary isolation gates in each tap-off. These Gates are to be made of Carbon steel with C276 cladding of sheet of minimum thickness 1.6 mm along with 2x100 % Seal Air fans. Also, seals to be made of Alloy C-276 or better material. Blanking plates shall also be provided in each tap-off duct after isolation gates.	We understand that only Inlet tap-off duct with Gate (for CO2 to Methanol system) is required, and Outlet tap-off duct (with Gate) is not required as in recent projects like NTPC Talcher Stage-III (2x660 MW), NTPC Lara Stage-II (2x800 MW), SCCL (1x800 MW). Please confirm.	Bidder's understanding is correct. Further, bidder to comply the specifications requirements for details on tap-off duct.
44	Section-VI, Part B	Sub-Section- A-02 (SG & Auxilia-ries in-cluding ESP)	Page 58 of 67	22.01.02	Leak tightness testing of dampers for each type and size of damper at shop to demonstrate the guaranteed gas tightness efficiency (on flow).	Leak tightness testing will be conducted for 1 number of each type and size of Gate & Biplane Damper, irrespective of Sub-vendor/ Sub-supplier.	Bidder's proposal is not acceptable. Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
45	VI/A	SUB-SECTION-IV FUNCTIONAL GUARANTEES	17 of 77	1.01.05.02	The corrections for the flue gas flow and ESP inlet flue gas temperature in excess of the values for these parameters under guarantee point conditions, shall be allowed only in case and to the extent such variations are caused solely due to changes in specified coal properties and ambient conditions. Further, the corrections for the flue gas flow and temperature lower than the guarantee point values shall be applied based on actually measured test values. Subject to the above, the corrections for the variation in flue gas flow, inlet dust burden and ESP inlet flue gas temp. shall be based on the above computed test values and the procedure indicated in the next para.	The tender indicates that estimating and applying corrections to parameters for their variation to the extent of change in specified coal properties and ambient conditions (during PG test), while assessing ESP performance. It may kindly be noted that ESP is designed for a specified set of parameters and is operated at actual condition. Hence, corrections will be applied for variation on actual test parameters (viz. gas flow, temperature & inlet dust) from guarantee point parameters while assessing ESP performances. This is applicable even for ESPs included in SG package as the change in parameters are not due to ESP. If the measured values are higher and corrected values are lower, corrections for design values will be taken for calculation of ESP efficiency. NTPC to note that corrections are allowed for actual measured values for all direct ESP contracts including recent projects like Mouda, Solapur, etc.	Bidder's query is not clear. However, bidder to note that the scope of EPC Package includes all equipment/systems upstream and downstream of ESP is included in the subject tender. Hence, the factors except for the coal properties and the ambient conditions within the scope/control of the bidder. Accordingly, the referred clause in the technical specifications allows for corrections solely due to changes in specified coal properties and ambient conditions.. Specification requirement is clear in this regard and the bidder to comply with the technical specifications.
46	VI/A	SUB-SECTION-IV FUNCTIONAL GUARANTEES	18 of 77	1.01.05.03	Ca.Cb.Cc etc. are Correction factors for flue gas at temperature, moisture content in flue gas, ESP inlet dust loading, sulphur and sodium contents of coal ash based on correction curves furnished by the Bidder and approved by the Owner.	The corrections for variation in flue gas flow, gas temperature, inlet dust concentration, sulphur content will be considered and the same will be submitted during contract stage.	The specification requirement is clear in this regard. Bidder to comply with the specification requirement.

47	VI/A	SUB-SECTION-IV FUNCTIONAL GUARANTEES	20 of 77	1.01.07.01	Method of computation of Aux. Power consumption for ESP: The measurement for guaranteed auxiliary power consumption shall be carried out during ESP collection efficiency test. The method for computing the power shall be as described below:- a) Power consumption of ESP will be measured pass wise and for one pass (Say ESPA) at a time with the help of energy meter in ESP MCC. b) Energy meter reading will be taken before starting the collection efficiency test and after completion of collection efficiency test. c) Before starting collection efficiency test, switch off all the TR sets, all hopper heaters, all insulator heaters/pent house fans (if applicable) and rapping systems serving to one pass.....	The method specified involve shutting down of total ESP fields just before start of emission test to measure external loads connected in ESP LTMSB. It is suggested that such switching off of the fields, heaters, rappers shall not be resorted to just before starting emission test. Hence, no external loads shall be connected to ESP LT Switchgear or (if not) this external load can be measured after completion of emission test i.e. ESP can be switched off after the emission test. Hence the power measurement test shall be taken up after completion of emission test.	Bidder's proposal reviewed and not accepted. Bidder to follow the procedure as given in the clause 1.01.07.01 of sub section IV, Part A Section VI.
48	VI/A	SUB-SECTION-IV FUNCTIONAL GUARANTEES	2 of 77	1.00.01 (g)	Instruments for PG test and instruments for process control of similar applications are envisaged to be of same make and model having same accuracy level. However, instruments for PG test are also acceptable as per standard and proven practice of the contractor/OEM and in such case, instruments for process control shall be as per requirements specified in Part-B of technical specifications. Instruments to be used for PG test shall be additionally supplied over and above the instruments shown in tender P&IDs. **PG test equipment being supplied, installed and commissioned for each unit, shall be retained by employer after completion of PG test.** Control system loop tuning required to limit the variation of parameters during performance guarantee testing shall be completed prior to PG Test / initial operation. **All PG test process parameters shall be made available in DDCMIS.**	During PG Test of ESP, outlet emission is measured by isokinetic sampling for particulate matter measurement as per EPA standard. The standard requires only portable instruments which does not warrant any erection or commissioning. It is also not possible to record the isokinetic sampling kit parameters in DDCMIS. For ready reference of Particulate emission, Opacity monitors are provided at ESP outlet. Other operating parameters of ESP will be recorded in IOS with interface to DDCMIS.	Bidder understanding is correct. Further bidder to comply to specification requirement.
49	VI/B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	60 of 67	2.01.01 (a)	The model study shall also include a gas distribution study in the inlet and outlet duct as well as, the cross over duct to find out the effect of isolation of one stream of the ESP,	As per ICAC code, the gas distribution study will be conducted at ESP inlet duct only and not at ESP outlet ducts.	Bidder's proposal is not acceptable. Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
50	VI/B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	60 of 67	2.01.01 (b)	The model study shall include all connecting duct work from air preheater gas outlets to the induced draft fans inlets, induced draft fan outlet to FGD inlet, FGD outlet to chimney flue inlet and also from the induced draft fan outlet to chimney flue inlet (in FGD bypass condition) including the inlet duct transition piece	The ESP Physical Flow Model will include the design of all connecting duct work from the air preheater gas outlets upto the induced draft fans inlets only. Physical modeling from Induced draft fan outlet, Ducts to/from FGD & chimney flue Inlet (FGD bypass duct) including the inlet duct transition piece is excluded from ESP Physical Flow Model study as we are not measuring air velocities in the Physical Flow Model beyond ESP Casing, as per ICAC standard. Flow correction devices if any, beyond ID fan is not required since this will not have any impact on ESP Flow Model study.	Bidder's proposal is not acceptable. Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
51	VI/B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	62 of 67	8.01.00	Dust hoppers shall be of conical type. ESP hoppers other than that of conical type shall not be acceptable.	Pyramidal hoppers which have similar ash flowability characteristics to conical hoppers, may also be accepted owing to simplicity of construction.	Bidder's proposal is not acceptable. Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
52	VI/B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	63 of 67	8.01.00	Hopper valley angle to the horizontal shall not be less than sixty five (65) degrees.	Hopper valley angle of 60° may be accepted as being followed for other projects of similar capacity.	Bidder's proposal is not acceptable. Specification requirement is clear in this regard. Bidder to comply technical specification requirement.

53	VI/B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	66 of 67	14.00.00	A comprehensive flowability study of fly ash from ESP hoppers shall be conducted by the contractor to ensure smooth flow of ash under various operating conditions of the plant including Steam Generator, ESP and Fly Ash Removal System. The hoppers are required to promote mass flow without arching and rat holing problems. The main aim of the flowability study is to ensure consistent flow from each hopper to the ash removal system and following requirements shall be met by the contractor in this connection: i) The study could be conducted on scaled down model of ESP hopper prepared by the bidder and at different relevant temperatures.....	Bidder clarifies as below for conductance of the test.: Evaluation of mass flow design parameters under gravity condition i.e valley angle for a given top opening of hopper with specified material of construction and outlet opening dimension by conducting shear test on three ash samples, as provided by NTPC. The test will be conducted at: a) Ambient temperature at test condition b) Maximum 60 deg. C. Bidder may engage an external laboratory to conduct the above test. The report on the above study will be furnished to NTPC by Bidder for information purpose. There shall be no effect on the project work schedule and no hold on the detailed engineering of ESP. No physical modeling is envisaged.	Specification requirement is clear in this regard. Bidder to comply the specifications requirements. Procedure for ash flowability study of ESP hoppers shall be discussed and finalised during detail engineering.
54	VI/B	SUB SECTION- G-04 STANDARD PG TEST PROCEDURE	48 of 185	METHOD OF COMPUTATION OF AUXILIARY POWER CONSUMPTION FOR ESP: -	Electrostatic Precipitator with all TR sets, all hopper heaters.....set point temperature shall be kept 5 degrees Celsius above the Design flue gas temperature/ operating flue gas temp whichever is higher.	Set point temperature will be kept 5 deg above operating flue gas temperature or 125 deg whichever is higher.	The set temperature shall be 5 deg. C above the gas temperature corresponding to the ESP guarantee point or the operating flue gas temperature whichever is higher.
55	VI Part-A	II-B ELECTRICAL SYSTEM / EQUIPMENTS	3 of 17	1.05.02	All Switchgears, Motor Control Centres (MCCs) & AC/DC distribution boards, etc. shall have at least twenty per cent (20%) or minimum two (whichever is higher) fully equipped MCCB/MPCB	Bidder proposes 10% or minimum two feeder spares for the LT Switchboards instead of 20% or minimum two (whichever is higher). Owner may kindly review and comment.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
56	VI Part-B	A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	63 of 67	8.03.00	The dust hoppers shall be electrically heated up to a minimum of lower one third (1/3) of the dust hopper height but not less than 1.5 metre in height by thermostatically controlled curved panel heating elements matching with curved surfaces of conical hopper to prevent ash bridge formation by maintaining the ash temperature above 140 deg C	The panel type heater's curved metallic enclosures are bent to the desired radius/shape at factory and supplied. However, during erection at site, any slight variation in the installation location may result in improper contact of panel heaters with the hopper curved surface, which may affect the desired performance. The vendors for curved panel type heaters are only one or two. In view of the above, bidder request owner/ NTPC to consider blanket type and other heater types that are suited to conical hopper surface heating requirements.	Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
57	VI Part-B	A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	64 of 67	8.07.00	Acoustic 3D Level Scanner Based Level Monitoring System / NOGS (Naturally Occurring Gamma Sensor) based level monitoring system for each ESP Hopper in the First Three Fields shall be provided complying with requirements indicated in Sub-Section-IIIC-03	The acoustic 3D level scanner / NOGS level scanners is yet to be commissioned and proven for ESP hopper applications. The cost is higher than the cost of conventional Ash level indicators, and the vendor availability is limited. Hence, owner/ NTPC may kindly consider conventional ash level indicators instead of 3D acoustic level scanner/ NOGS based level monitoring for ESP hopper applications. Owner may kindly review and confirm.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
58	VI Part-B	B-0 GENERAL ELECTRICAL SPECIFCIATION	8 of 16	3.06.00 (d)	MCCB shall be provided for all supply feeders of current rating above 16 Amp and including 400A.	For ESP LT Switchgear, MCCB shall be provided up to 630 A, and breaker modules shall be provided for current above 630 A. This is in line with the standard design practise of ESP switchgear for projects. Owner may kindly review and confirm.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.

59	VI Part-B	B-02 MOTORS	1 of 5	3.01.00 (b)	Continuous duty LT motors upto 50 KW Output rating (at 50 deg.C ambient temperature), shall be super Premium Efficiency class-IE4, 50-200 KW shall be of Premium Efficiency class – IE3, conforming to IS 12615, or IEC:60034-30	The ESP geared rapping motor is fractional horse power drive and is operated intermittently for ESP application. Since the ESP rapping motor operation is intermittent , IE4 motors are not provided. Instead IE2 rated motors are provided. This is in-line with other NTPC projects also. Owner may kindly review and confirm.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
60	VI Part-B	B-08 HT ,LT POWER CABLES	5 of 7	4.00.05 (a)	Cables shall be supplied in steel drums of heavy construction.	Bidder proposes wooden drum also in addition to steel drums for the power cables. Owner may kindly review and confirm.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
61	VI Part-B	IIIC-04 MEASURING INSTRUMENTS (PRIMARY & SECONDARY)	5 of 36	3.02.00 (1)	Type of RTD: Four wire, Pt-100	Bidder proposes that 3-wire RTD may also be given for temperature measurement of the various equipment (FANS/ Motors etc) as per the bidder's proven design. This is in-line with design provided for various projects. Owner may kindly review and confirm for 3-wire RTD / 4-wire RTD (as per bidder design) for FANs application..	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
62	VI Part-A	SUB-SECTION-IIC CONTROL & INSTRUMENTATION SYSTEM	5 of 20	1.06.02 (M)	For High torque (> 1000 Nm) electric actuators: Contractor may propose non-intrusive fieldbus electrical actuators without SIL2 certification.	The SIL-2 compliant models include imported actuators and are about 5 times costlier. Considering the initial cost, maintenance as well as spares costs and the import requirements, bidder request NTPC to kindly remove the SIL-2 requirement for the electrical actuators. Owner may review and confirm that, SIL-2 certification is not applicable for the electrical actuators	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
	VI Part-B	IIIC-17 ELECTRICAL ACTUATORS	2 OF 4	4.11.00	SIL Certification:		
63	VI Part-E / Tender SLD	Part-E/Elect_Cnl/ 9551-999-POE-J-002 REV-A Single Line diagram-MAIN PLANT		SLD Notes point (F) .	(F) . Standard LT transformer rating to be used are as follows 2500/2000/1600/1000/630/500/315 KVA.	Bidder understands that use of both LT ONAN and LT DRY type transformers upto 2.5 MVA are allowed as per SLD . However in Sec-B-04-/1.03.01, it is mentioned that ONAN transformers are allowed only till 2.0 MVA. Kindly review and confirm that ONAN LT transformers can be provided till 2.5 MVA. The same is in-line with the other NTPC EPC projects also. Owner may kindly review and confirm.	Bidder proposalis not acceptable. Bidder shall comply to technical specification
64	VI Part-B	SUB SECTION B-06 LT SWITCHGEARS & LT BUSDUCTS	13 of 19	7.00.00	Each motor/heater feeder shall consist of MPCB/MCCB (with S/C release only), Power contactor & intelligent motor controller (IMC) to ensure Type-2 Co-ordination. If the ESP controller and rapping motor are provided in the ESP switchgear, same shall be with IMC having MPCB/MCCB. If separate controller is provided and only supply feeder is envisaged from ESP Switchgear, the requirement of IMC may be excluded.	a) ESP rapping motors are fractional horse power motors. We are offering separate ESP controller which controls the ESP rapping motor . The controllers ensures the best sequence of rapping of various fields and provides better coordination of rapping motors for achieving the desired emission parameters. No control is envisaged from the ESP switchgear. Only supply feeder with OLR and power contactor is provided from ESP switchgear. b) The ESP heaters (hopper/ insulator) are thermostat controlled for maintaining the desired temperature. No control is envisaged from the ESP switchgear. Only supply feeder with contactor is provided from ESP switchgear. Further, IMC not applicable for heater feeders. The ESP motor and heater controls are proven design being offered in all the NTPC contracts. Since no control of rapping and heaters are envisaged from ESP switchgear (only supply feeder with OLR & contactor are provided in ESP switchgear) , bidder proposes ESP switchgear without IMC. Owner may kindly review this requirement based on the implementation of ESP motor and heater controls in the various NTPC projects. Owner may Kindly review and confirm.	Bidder proposal is not acceptable. Bidder shall comply to technical specification

65	VI Part-B	SUB-SECTION-IIIC-17 ELECTRICAL ACTUATORS	1 of 4	3.00.00	These actuators shall be Non-Intrusive type electric actuators. The interface of these actuators with DDCMIS shall be of two types viz. with Hardwired interface and with Fieldbus interface	Bidder proposes that all the actuators for the gates and dampers can be hardwired interface instead of fieldbus interface for the following reasons: a) Providing Uniformity of communication interface for all the actuators b) Some vendors don't have the Profibus based actuators for the complete range Owner may kindly review and confirm for hardwired actuators for gates and dampers instead of fieldbus based actuators.	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
66	VI Part-B	SUB-SECTION-IIIC-04 MEASURING INSTRUMENTS (PRIMARY & SECONDARY)	2 of 36	2.01.00	Microprocessor based 2 wire loop powered electronic transmitter with 4-20 mA DC HART/ Fieldbus (Foundation Fieldbus /Profibus PA complying to IEC 61158.) output signal shall be provided.	Bidder understands that bidder can provide either HART based / fieldbus based transmitters , as per the tender specification. Hence bidder proposes HART based transmitters for all applications instead of fieldbus based transmitters. This shall provide uniformity. Owner may kindly review and confirm	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
67	NA				General Query - Electrical query	The number of layers of cables in the cable trays is not mentioned. Bidder understands that the maximum cable layer is 2 layers for power cables and 3 layers for control and instrumentation cables. This is based on standard practise being followed for all other NTPC projects also. Owner may kindly review and confirm	Bidder's proposal is not acceptable. Bidder shall comply to technical specification.
68	NA				General Query- mandatory spares query	In case mandatory spares are repeated at more than one location, bidder proposes to consider only at one location (the one location where maximun quantity is specified shall be considered). Owner may kindly review and confirm the same. In case mandatory spares are to be considered in all the locations wherever it is specified, same may be clearly indicated to the bidders.	It is clarified that in case Mandatory spares are repeated at more than one location, Bidder to consider item/spare indicated with maximum quantity, unless otherwise specifically stated.
69	Section-VI, Part A	Sub section-II, A-01	15 of 28	2.16.05A	Provision for Future Installation of SCR system	Please confirm whether the APH should be SCR ready or not	Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
70	Section-VI, Part B	Sub section-A-02	18 of 67	9.01.03 (4)	Air Heater Seals - The Contractor shall also demonstrate that the drift in air heater leakage (percentage change in air-in-leakage) does not exceed 1%, one year after demonstration of above guaranteed air-in-leakage.	The drift in air heater leakage will not exceed 2%, one year after demonstration of guaranteed air-in-leakage	Bidder's proposal is not acceptable. Specification requirement is clear in this regard. Bidder to comply technical specification requirement.
71	Section-VI, Part A	Sub section-VI	13 of 41	3.5.1 & 3.5.2	Filter housing Assembly (with changeover lever) -1 No. & Filter Element-4 No's.	Both the filter housing and filter elements must be provided together as a set, rather than separately. So, as a result, 4No's complete filters will be considered instead of individual components.	This is part of detail engineering. Bidder is requested to supply the mandatory spares as specified. Further Bidder to please also refer provisions specified in Mandatory spare chapter sub-section-VI, Part-A/section-VI.
72	Section-VI, Part A	Sub section-VI	14 of 41	9.4	Speed Reducer Seals & Gaskets	Gaskets are not Applicable, Seals will be offered.	This is part of detail engineering. Bidder is requested to supply the mandatory spares as specified. Further Bidder to please also refer provisions specified in Mandatory spare chapter sub-section-VI, Part-A/section-VI.
73	VI	B-13	12 OF 45	7.00.0 (i)	Redundant Controllers and Operator workstations shall be provided and shall be based on the latest state of the art workstations and servers and technology suitable for industrial applications and switchyard environments.	We understand that the present scope bays are to be integrated with existing Substation Automation system. Kindly confirm the requirement of Controllers/servers as same is not envisaged as per Tender architecture XXXX-999-POE-J-003.	Bidder's understanding is correct. However, the Bidder shall supply any additional equipment needed for the successful completion of the project.

74	VI	B-13	28 OF 45	9.02.12	Bus bar Protection	Kindly provide the following: a. Existing 400KV Busbar Protection scheme. b. Existing 132KV Busbar protection scheme. c. Kindly confirm whether the existing Central Unit for 400KV & 132 KV existing Busbar protection has provision of augmenting Peripheral Units of present scope bays.	a)400kV is not applicable for the project. B)132kV Busbar protection scheme shall be provided during detailed engineering.
75	VI	B-13	29 OF 45	9.02.12	Islanding Scheme	Kindly clarify the following: a. We understand that Islanding scheme for 765KV Switchyard is already existing and only trip relays for new present scope bays are to be provided. Kindly confirm and provide the existing 765 KV Islanding protection schematic drawing. b. Kindly clarify the requirement of Islanding scheme for 132KV Switchyard.	a. Scheme for 765kV and 132kV system shall be provided during detailed engineering.
76	VI	B-13	32 OF 45	10.02.00 (xvi)	A dedicated Metering Master Station (MMS), networked to all the energy meters in contractor's scope shall be provided.	Kindly clarify the requirement as same is not shown in the Substation Automation Architecture XXXX-999-POE-J-003.	Bidder's understanding is correct. However, the Bidder shall supply any additional equipment needed for the successful completion of the project.
77	VI/B	A-25	977	1	Tentative Roof top Solar Plant Capacity will be 500kWp.	Kindly provide following inputs - 1. Please indicate the maximum capacity of cumulative solar systems be allowed for installation. The limit is required for proper estimation. 2. Please confirm that amount alloted for setting up solar installation would be fixed irrespective of installed capacity. This implies that if the installable capacity is less than maximum allowed installation capacity, then there would be no price adjustment in any manner. 3. Please confirm that indicated capacity is DC capacity.	1. Tentative capacity of roof top solar system is 500kWp. Actaul capacity shall be as decided during detailed engineering 2. Bidders understanding is not correct 3. Confirmed
78	VI/B	A-25	978	1.6	During O&M period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of all equipments in the plant including defective PV Modules, Inverters, Transformers etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending. All PV modules shall be cleaned regularly and water washed at least once in a week.	Please confirm that 1. we can depute our sub-contractor's staff for O&M activities. Deputing Bidder staff is not obligatory. 2. only 1no qualified & experienced supervisor is sufficent to be permanently deputed during O&M period (for total solar systems). 3. Electrician for periodic checking & labours for periodic cleaning of PV modules are allowed to be arranged locally on as and when basis.	1. Bidders Proposal is accepatble. Eventhough the subcontractors staff deputed at site, but still the resposnibility lies with Bidder only. 2. Bidders understanding is correct. 3. Bidders understanding is correct.
79	VI/B	A-25	978	1.8	Bidder to dispose of the packing material, surplus items, unused materials, waste etc. generated during EPC at location(s) identified by NTPC.	Kindly confirm that area for disposal is within NTPC's premises & no separate approvals/permits need to be secured by the bidder.	Bidders Understanding is correct
80	VI/B	A-25	980	5.1	The cables used in the system should be ISI marked PVC or XLPE insulated FRNC armored Copper/aluminum conductor. Cables of various sizes as per load requirement for connecting all the modules / arrays to Junction Boxes and from Junction Boxes to DC distribution box and from DC distribution box to inverter. Cables shall be armoured type if laid in switchyard area or directly buried	Solar cables on DC side are unarmoured Copper conductor. Further, in rooftop solar systems, DC cables are not laid underground. Therefore, please allow unarmoured copper conductor DC cable up to inverter, irrespective of area/building.	Bidders proposal is not acceptable. Bidder Shall comply to the technical sepcifications
81	VI/B	A-25	980	5.3	Suitable industrial Grade B rigid conduits shall be provided for cables connecting Solar PV array with Inverter.	Please allow HDPE pipes as conduit for DC cabling, wherever required.	Bidders proposal is not acceptable. Bidder Shall comply to the technical sepcifications

82	VI/B	A-25	981	6.6	Built-in meter at PCU/String Inverter and data logger to monitor plant performance through external computer shall be provided. Customized solar monitoring solutions available with Inverter manufacturer shall be preferred.	1. Please clarify whether separate external computer for monitoring solar systems shall be provided by the bidder. 2. If yes, please indicate the features required in the PC. 3. Please confirm that internet required in data loggers would be provided on respective rooftop through LAN cable. 4. Please confirm that recurring charges of internet data consumed would be borne by NTPC.	1. No separate external computer is not in bidder's scope. 3. Connection upto nearest available owners Lan network shall be in bidders scope. 4. Charges till end of AMC period are in Bidders scope
83	VI/B	A-25	982	7	If the output of the inverter matches to the switchgear voltage and suitable for directly connection to grid without galvanic isolation, the requirement of transformer may be ommited except Main Power House building, Switchyard building and Ash Slurry Pump house.	Please allow omission of requirement of transformer in Main Power House building, Switchyard building and Ash Slurry Pump house also, if the individual rooftop capacity is less than 500kWp.	Bidders proposal is not acceptable. Bidder Shall comply to the technical sepcifications
84	VI/B	A-25	985	11	An appropriate Solar PV Module cleaning & water washing system complete GI pipes, valves, hose pipes, wipers, mops etc. shall be provided for regular cleaning and water washing of the rooftop Solar PV modules.	Please allow HDPE pipes instead of GI pipes.	Bidders proposal is not acceptable. Bidder Shall comply to the technical sepcifications
85	VI/B	QA-Elec	364	5	Dry Type Transformer	Indicated sub suppliers are approved for HT class. However, dry type transformers used in solar systems are below 1kV class. 1. Kindly clarify that if transformer in solar is required, then referred sub-supplier is applicable for LT class also. 2. If yes, kindly incorporate "TARIL", "Ferromag" & "Servokon" also.	1. Indicated sub supplier list is applicable for LT class also. 2. BIDDER IS TO FOLLOW NTPC TECHNICAL SPECIFICATIOANS AND GTR
86	VI/B	QA-Elec	370	24	SPV module	Kindly incorporate other renowned suppliers like - 1. Saatvik 2. Bluebird 3. Renewsys 4. Panasonic 5. other reputed make as per ALMM list.	BIDDER IS TO FOLLOW NTPC TECHNICAL SPECIFICATIOANS AND GTR
87	VI/B	QA-Elec	371	25	Power Conditioning Unit (PCU)	Kindly incorporate other renowned suppliers of string inverters like - 1. Powerone 2. Delta 3. Kaco 4. Havells 5. other reputed make.	BIDDER IS TO FOLLOW NTPC TECHNICAL SPECIFICATIOANS AND GTR
88	VI/B	QA-Elec	371	25.1	String Monitoring Box (SMB)	Kindly incorporate other renowned suppliers like - 1. RSS India 2. Innova 3.KERNEL Sistemi Srl 4. SRR Energy 5. other reputed make.	BIDDER IS TO FOLLOW NTPC TECHNICAL SPECIFICATIOANS AND GTR
89					DC Cables	Kindly incorporate other renowned suppliers like - 1. KEI 2. RR Kabel 3. Polycab 4. other reputed make.	BIDDER IS TO FOLLOW NTPC TECHNICAL SPECIFICATIOANS AND GTR
90					General	Please confirm that netmetering/gross metering is NOT applicable.	Bidder proposal is not acceptable. Specification cl. no.1.3 Sub - Section A-25 Section-VI, Part-B to be followed.
91					General	Please confirm that solar power termination of individual solar system will be done on respective LT panel of each building.	Bidder Understanding is correct
92					General	Please confirm that no HT work is involved in solar scope.	HT work may be applicable, if bidder opts to feed the roof top generation at 11KV station switchgear
93					General	Please confirm that no separate Lightning Protection is required for solar system, if the respective building is already protected.	Bidder proposal is not accepted. Bidder to provide the lightning protection for solar system as the building lightning protection system shall not cover the solar system