

BOQ		Doc No:	PE-PF-415-554-A001				
		Rev No:	0				
		Date of issue	22 August 2019				
NAME OF PROJECT:		1X660 MW BHUSAWAL TPS					
NAME OF PACKAGE:		VENTILATION SYSTEM					
TECHNICAL SPECIFICATION No:		PE-TS-415-554-A001					
S. No.	DESCRIPTION	UNIT	QTY	HSN/SAC CODE			
1	Total lump sum firm price for Supply part, Services part and Mandatory spares comprising of design (i.e.preparation and submission of drawing /documents including "As Built" drawings and O&M manuals), engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, maintenance tools & tackles (as applicable) fill of lubricants & consumables till COD, mandatory spares alongwith spares for erection, startup and commissioning as required, forwarding, proper packing, shipment and delivery at site, unloading, handling, transportation & storage at site, in-site transportation, assembly, erection & commissioning, final painting at site, minor civil work, trial run at site and carrying out Performance guarantee / Functional / Demonstration tests at site (As applicable), training of customer/client O&M staff (Bidder / Sub-contractor works as per spec) and handover in flawless condition of the package to the end customer complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification as specified above, amendment & agreements till placement of order.	Lot	1				
2	MAJOR BREAK-UP OF PRICES GIVEN IN 1.0 ABOVE.						
2.1	Total lump sum firm price for Supply part comprising of design (i.e.preparation and submission of drawing /documents including "As Built" drawings and O&M manuals), engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, maintenance tools & tackles (as applicable), fill of lubricants & consumables till COD alongwith spares for erection as required, startup and commissioning spares as required, forwarding, proper packing, shipment and delivery at site for the total scope defined as per BHEL NIT & tender technical specification as specified above, amendment & agreements till placement of order. (Break up as per Annexure-I)	Lot	1	8414 59 30			
2.2	Total lumpsum firm prices for Services part comprising of service part for unloading, handling, transportation & storage at site, in-site transportation, assembly, erection & commissioning, final painting at site, minor civil work, trial run at site and carrying out Performance guarantee / Functional / Demonstration tests at site (As applicable), training of customer/client O&M staff (Bidder / Sub-contractor works as per spec) and handover in flawless condition of the package to the end customer complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification as specified above, amendment & agreements till placement of order. (Break-up as per Annexure-I)	Lot	1	995463			
2.3	Total lumpsum firm price for Mandatory spares comprising of manufacture, fabrication, assembly, inspection / testing (as applicable) at vendor's & sub-vendor's works, painting, forwarding, proper packing, shipment, delivery at site & guarantee as per tender technical specification above, amendment & agreements till placement of order. (Price break up of mandatory spares is to be furnished as per Annexure- II)	Lot	1	8414 90 90			

ANNEXURE - I
PRICE BREAKUP (FOR MAIN PLANT, ESP AND OTHER AUX BUILDINGS)

NAME OF PROJECT:		1X660 MW BHUSAWAL TPS			
NAME OF PACKAGE:		VENTILATION SYSTEM			
TECHNICAL SPECIFICATION No:		PE-TS-415-554-A001			
SL NO	DESCRIPTION	Qty	UNIT	SUPPLY	ERECTION AND COMMISSIONING
1	Sheet metal type air washer unit with centrifugal fan (DIDW) with motor, pumps with motors, air washer internals, inlet air louvers, filters, piping as per IS:1239, Part-I (heavy class galvanised), valves, nozzles, instruments, back wash arrangement, galvanised drain piping, FRP lining with epoxy coating etc. along with support for suction and discharge plenum as per specification of capacity 2,50,000 CMH. Each air washer has 2 no centrifugal fan (2 x 50% duty) of each capacity 1,25,000 CMH at min. 75 mm SP.	4	Nos		
2*	Unitary air filtration unit with centrifugal fan (SISW) with motor, pumps with motors, filters, UAF internals, piping as per IS: 1239 pt I (heavy class galvanised), valves for auto start of standby equipment, nozzles, instruments, back wash arrangement, galvanised drain piping, FRP lining with epoxy coating etc. along with support for suction and discharge plenum as per specification of capacity 80,000 CMH. Each UAF has 2 no centrifugal fan (2 x 50% duty) of each capacity 40,000 CMH at min. 65 mm SP.	4	Nos*		
3*	Double Skinned (0.6 mm thick pre coated outer skin, 0.6 mm thick plain GI inner skin with CFC free PUF insulation in between) Fan Filter Unit (FFU) shall comprise of centrifugal fans (DIDW) with TEFC Squirrel Cage induction motors, drive pkg, prefilter with filter mounting frame, inlet air louvers, bird screen, VI pads, SS foundation bolts, nuts, & washers, Fire retardent canvass connection, outlet damper, VCD and all other accessories as required for complete installation as per specifications. The capacity of each FFU shall be 30000 CMH having 1 x 100% fan. Capacity of each fan shall be 30,000 CMH at min. 50 mmwc SP).	1	Nos*		
4*	Supply air ducting (finished) for above area complete with dampers, grills (with VCD & without VCD), supports (painted) and all accessories as specified.				
4.1*	Finished GSS (zinc coating 275 gms/sq.m) Ducting with support structure etc.				
a)*	18 G	970	SQM*		
b)*	20 G	970	SQM*		
c)*	22 G	2900	SQM*		
d)*	24 G	4800	SQM*		
4.2*	MS Duct With Epoxy paint for battery room.	120	SQM*		
4.3*	Grilles with VCD	140	SQM*		
4.4*	Grilles without VCD	10	SQM*		
4.5*	Exposed duct insulation with finish as per specifications.	1200	SQM*		
4.6*	Wall mounted dampers (gravity operated) for different areas.	90	SQM*		
4.7*	Inlet Louvres	200	SQM*		
4.8*	Volume control dampers	30	SQM*		
4.9*	FIRE DAMPER				
a)*	Fire damper	40	SQM*		
b)*	Motorized Actuator with single phase power supply for the above Fire damper with auto resetting, limit switches, indication lamps etc.	20	Nos*		
c)*	Fusible Link type Fire Damper	15	SQM*		
5*	Roof extractor units (axial flow type) with hood, disconnect switch and all accessories as specified. Following fan shall have 15 mmwc static pressure.				
a)*	Capacity 50,000 CMH with Motor rating 5.5 KW	14	Nos.*		
b)*	Capacity 40,000 CMH with Motor rating 5.5 KW	10	Nos.*		
c)*	Capacity 20,000 CMH with Motor rating 2.2 KW	4	Nos.*		
6*	Axial flow supply fans with pre and fine filter (wall mounted) complete with casing, TEFC sq cage induction motors & mounting frame, MS rain protection cowl, bird screen along with support structure and all other accessories (suitable for 415V/3-phase supply). Following fan shall have 30 mmwc static pressure.				

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SL NO	DESCRIPTION	Qty	UNIT	SUPPLY	ERECTION AND COMMISSIONING
a)*	Capacity 10,000 CMH with Motor rating 2.2 KW	16	Nos.*		
b)*	Capacity 7,500 CMH with Motor rating 1.5 KW	22	Nos.*		
c)*	Capacity 6,000 CMH with Motor rating 1.1 KW	8	Nos.*		
d)*	Capacity 4,000 CMH with Motor rating 0.75 KW	6	Nos.*		
7*	Axial flow supply fans with pre filter (wall mounted) complete with casing, TEFC sq. cage induction motors & mounting frame, MS rain protection cowl, bird screen along with support structure and all other accessories (suitable for 415V/3-phase supply) as specified. Following fan shall have 20 mmwc static pressure.				
a)*	Capacity 10,000 CMH with Motor rating 1.5 KW	40	Nos.*		
b)*	Capacity 7,500 CMH with Motor rating 1.1 KW	4	Nos.*		
c)*	Capacity 6,000 CMH with Motor rating 1.1 KW	4	Nos.*		
d)*	Capacity 4,000 CMH with Motor rating 0.75 KW	4	Nos.*		
8*	Axial flow exhaust fans (Bifurcated type, spark proof construction, wall mounted) complete with casing, flame proof motor & mounting frame, MS rain protection cowl, bird screen along with support structure and all other accessories epoxy painted (suitable for 415V/3-phase supply) as specified. Following fan shall have 15 mmwc static pressure.				
a)*	Capacity 15,000 CMH with Motor rating 2.2 KW	40	Nos.*		
b)*	Capacity 10,000 CMH with Motor rating 1.5 KW	22	Nos.*		
c)*	Capacity 7,500 CMH with Motor rating 1.1 KW	19	Nos.*		
d)*	Capacity 4,000 CMH with Motor rating 0.55 KW	10	Nos.*		
e)*	Capacity 2,000 CMH with Motor rating 0.55 KW	4	Nos.*		
9*	Axial flow exhaust fans (Wall mounted) complete with casing, TEFC sq. cage induction motor & mounting frame, MS rain protection cowl, bird screen along with support structure and all other accessories epoxy painted (suitable for 415V/3-phase supply) as specified. Following fan shall have 10 mmwc static pressure.				
a)*	Capacity 15,000 CMH with Motor rating 1.1 KW	40	Nos.*		
b)*	Capacity 10,000 CMH with Motor rating 0.75 KW	35	Nos.*		
c)*	Capacity 7,500 CMH with Motor rating 0.55 KW	4	Nos.*		
d)*	Capacity 6,000 CMH with Motor rating 0.55 KW	4	Nos.*		
e)*	Capacity 4,000 CMH with Motor rating 0.55 KW	4	Nos.*		
f)*	Capacity 2,000 CMH with Motor rating 0.37 KW	4	Nos.*		
10*	Exhaust fan (propeller type) completes with induction motor & mounting frame MS rain protection cowl, bird screen along with support structure (if required) and all other accessories as specified (suitable for 240V/ 1 phase). Following fan shall have 5 mmwc static pressure.				
a)*	Capacity 1200 CMH with Motor rating 100 watts	100	Nos.*		
11*	Handling arrangement for Ventilation system.				
a)*	Manual operated trolley, platform trolley of 1 ton capacity with base area 2mx1.5m.	2	Nos.*		
b)*	1T chain pulley block with travelling trolley	4	Nos.*		
c)*	1T chain pulley block without travelling trolley	2	Nos.*		
12*	Online nonchemical scale preventer with all accessories as required to meet the system requirements.	6	Nos.*		
13	Total lumpsum price for special tools & tackles for maintenance inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up-As per Appendix A).	1	LOT		NA
14	Total lumpsum price for commissioning spares inclusive of packing forwarding, transportation up to site, etc. (Bidder shall submit item-wise price break-up-As per Appendix B).	1	LOT		NA
15	FIELD INSTRUMENTS like transmitters, switches and gauges for measurement of pressure, differential pressure, temperature, level and flow and any other instrument required for complete Ventilation System.	1	LOT		
16*	Local control panel for local operation of each air washer alongwith their accessories for hooking up with DCS.	4	Nos.*		

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SL NO	DESCRIPTION	Qty	UNIT	SUPPLY	ERECTION AND COMMISSIONING
17*	Local control panel for local operation of each UAF alongwith their accessories for hooking up with DCS.	3	Nos.*		
18*	Electrical items like Cable tray, conduits, junction box and any other item etc. required for completion of Ventilation system	1	LOT		
19*	Providing full support during FAT of DDCMIS, preparation of control scheme, and commissioning of DDCMIS as per relevent specification.	21	Mandays*	NA	
20	Any other item not indicated above, but required to make the system complete in all respects.	1	LOT		

NOTES					
1	The bidder shall furnish unit rates for variable item (marked *) and the same shall be used for necessary adjustment (plus or minus) variation during detailed engg. stage. Unit rates shall be valid throughout the contract.				
2	Bidder to note that above BOQ for this tender has to be read in conjunction with tender specification. Any item, if not mentioned in above BOQ but indicated in tender specification and required for completion of the system shall deemed to be included in above price.				

APPENDIX-A
Special tools & tackles for maintenance

NAME OF PROJECT:		1X660 MW BHUSAWAL TPS	
NAME OF PACKAGE:		VENTILATION SYSTEM	
TECHNICAL SPECIFICATION No:		PE-TS-415-554-A001	
SL NO	DESCRIPTION	UNIT	Qty
1	Measuring tape	NO	1
2	Tachometer	NO	1
3	Double ended spanner	SET	1
4	Ring spanners	SET	1
5	Gasket punch	NO.	1
6	Center punch	NO.	1
7	Hammer with wooden handles	NO.	1
8	Scissors for sheet metal cutting	NO.	1
9	Torch light (suitable for 2 cells)	NO.	1
10	Multimeter	NO.	1
11	Anemometer	NO.	1
12	Compound pressure gauge	NO.	1
13	Slide wrench 8"	NO.	1
14	Slide wrench 10"	NO.	1
15	Slide wrench 6"	NO.	1
16	Box spanner set	SET	1
17	Screw driver set	SET	1
18	Align key set	SET	1
19	MS tool box	NO	1
NOTES			
1	ABOVE IS THE MINIMUM LIST. ANY OTHER TOOL / TACKLE REQUIRED FOR THE SYSTEM SHALL ALSO BE PROVIDED BY THE VENDOR WITHOUT ANY COST IMPLICATION.		

APPENDIX-B
Commissioning spares

NAME OF PROJECT:		1X660 MW BHUSAWAL	
NAME OF PACKAGE:		VENTILATION SYSTEM	
TECHNICAL SPECIFICATION No:		PE-TS-415-554-A001	
SL NO	DESCRIPTION	UNIT	Qty
1	FAN BELTS	SET	1
2	PRESSURE GAUGE	NO	1
3	TEMPERATURE GAUGE	NO	1
4	FILTER	SET	1
NOTES			
1	ABOVE IS THE MINIMUM LIST. ANY OTHER COMMISSIONING SPARE REQUIRED FOR THE SYSTEM SHALL ALSO BE PROVIDED BY THE VENDOR WITHOUT ANY COST IMPLICATION.		

ANNEXURE - II LIST OF MANDATORY SPARES		Doc No:	PE-PF-415-554-A001
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TECHNICAL SPECIFICATION No:		PE-TS-415-554-A001	
S. No.	Description	Qty	
I	MECHANICAL		
1	Air washer unit		
1.1	Supply air fan		
a.	Air fan	1 no.	
b.	V belts	4 sets	
c.	Bearing	2 sets	
1.2	Air washer pumps		
a.	Pump set along with motor	1 no.	
b.	pump impeller	1 no.	
c.	pump bearing	2 set	
d.	Shaft sleeves	4 no.	
e.	Gland packing	4 no.	
1.3	Metallic / fabric panel filters, as applicable	1 Set (quantity for one air washer)	
1.4	Spray nozzles	1 Lot (5 % of total population or Ten (10) whichever is higher)	
1.5	Flooding nozzles if applicable	1 Lot (5 % of total population)	
1.6	Air washer pump inlet water strainer	1 no.	
1.7	Brass suction / screen strainer for Air washer tank	1 set	
2	Unitary air Filtration unit (for each model and capacity)		
2.1	Supply air fans		
a.	air fan	1 no.	
b.	V-belts	2 sets	
c.	Bearings	1 set	
2.2	UAF PUMPS		
a.	Pump set along with motor	1 no.	
b.	pump impeller	1 no.	
c.	pump bearing	1 set	
d.	Shaft sleeves	2 sets	
e.	Gland packing	2 sets	
2.3	Nylon filters	1 set	
2.4	Spray nozzles	1 Lot (5 % of total population or Ten (10) whichever is higher)	

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2.5	Flooding nozzles if applicable	1 Lot (5 % of total population or Two (2) whichever is higher)	
2.6	water strainer	1 no.	
2.7	Brass Unitary Air filtration unit tank suction screen / strainer for Unitary Air filtration unit tank	1 set	
3	Mechanical ventilation system		
3.1	Roof exhauster fans (for each type, rating and capacity)	1 Lot (5 % of total population or one (1) whichever is higher)	
3.2	Supply air fans (wall mounted) (for each type, rating and capacity)	1 Lot (5 % of total population or one (1) whichever is higher)	
3.3	exhaust air fans (wall mounted) (for each type, rating and capacity)	1 Lot (5 % of total population or one (1) whichever is higher)	
4	Miscellaneous valves	1 Lot (10 % of each type and size with minimum one (1))	
5	Mandatory Spares for Chain Pulley Blocks (for each type and rating)		
5.1	Load chain wheel	1 no.	
5.2	Load chain stripping fork	5 no.	
5.3	Hand chain wheel	2 no.	
5.4	Ratchet pawl	1 no.	
5.5	Locking ratchet wheel	2 no.	
5.6	Guide roller	2 no.	
5.7	Brake disc	2 no.	
II	ELECTRICAL		
1	415 V MOTORS		
a.	Terminal plates for motors upto 30kw for each rating	1 Lot (1 no. For each type & rating of Motor)	
b.	Terminal plates for motors above 30kw for each rating	1 Lot (1 no. For each type & rating of Motor)	
c.	Heaters	1 Lot (1 no. For each type & rating of Motor)	
d.	Greasing arrangements	1 Lot (1 no. For each type & rating of Motor)	
e.	Motor of each type and rating	1 Lot (10% of the installed quantity or minimum 1 number whichever is higher)	
f.	Bearings (DE and NDE)	1 Lot (1 set For each type & rating of Motor)	
g.	End shield cover driving & non driving end	1 Lot (1 set For each type & rating of Motor)	

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h.	Cooling fan	1 Lot (1 set For each type & rating of Motor)	
i.	Motor terminal block	1 Lot (1 set For each type & rating of Motor)	
j.	Complete set of coupling	1 Lot (1 set For each type & rating of Motor)	
2	DC Motors of each type and rating		
a.	Carbon brushes of each type	10 sets	
b.	Brush assemblies of each type	2 sets	
c.	Terminal blocks of each type	2 sets	
d.	Heaters of each type	2 sets	
e.	Pulley of each type	2 sets	
f.	Motor of each type and rating	1 Lot (10% of the installed quantity or minimum 1number whichever is higher)	
g.	Bearing (DE and NDE)	1 Lot (1 set For each type & rating of Motor)	
III	C&I		
1	MEASURING INSTRUMENTS		
1.1	ELECTRONIC TRANSMITTERS		
1.1.1	Transmitters of all types, ranges and model no. (for the measurement of Pressure, differential pressure flow, level etc.)	1 Lot (10% or 2 no. of each type and model, whichever is more)	
1.1.2	Electronic cards / PCB's for each type and model and model of transmitters	1 Lot (10% or 5 nos. of each type, whichever is more)	
1.2	TEMPERATURE ELEMENTS		
1.2.1	RTDs of each type & length	1 Lot (10% or 2 nos. whichever is more)	
1.2.2	Thermocouples of each type like K-type, R-type, metal etc and length	1 Lot (10% or 2 nos. whichever is more)	
1.2.3	Thermowell for T/C & RTDs	1 Lot (10% or 1 no. of each type, rating, length used in the system whichever is more)	
1.2.4	Process actuated switch devices Including all types of pressure, differential pressure, flow, temperature, differential temperature, level switch devices	1 Lot (10% or 1 no. of each type and model whichever is more)	
1.3	INDICATORS/RECORDERS		
1.3.1	Digital Indicators of each model, type & range (including relevant digital indicators of electrical system)	1 Lot (10% or 2 nos. min. whichever is more)	
1.3.2	Vertical Indicators of each type & model	1 Lot (5% or 1 no. of each model whichever is more)	

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1.3.3	Recorders for each type and model	1 Lot (5% or 1 no. whichever is more.)	
1.3.4	Consumables for continuous recorders Charts Ink capsules	1 Lot (25 rolls per recorder/ 25 nos per recorder/ 20 nos. per recorder / Ink Pads /Pens.)	
1.3.5	Consumables for multi point recorders		
a.	Charts	1 Lot (5 nos. per recorder)	
b.	Ink pads	1 Lot (5 nos. per recorder)	
c.	Print mechanism/ print head assembly	1 Lot (10% or 5 nos. of each type whichever is more)	
1.3.6	Level transmitters (displacer type)		
a.	Electronic cards / PCB's of level transmitters	1 Lot (10% of total quantity used or 1 for each type/rating whichever is more)	
b.	Level transmitters	1 Lot (10% of total quantity used or 1 for each type/rating whichever is more)	
c.	Electronic water level indicator	1 Lot (10% or 2 nos. min. whichever is more)	
1.3.7	PD type flow transmitters	1 Lot (10% of total quantity used or 1 for each type/rating whichever is more)	
1.4	SWITCHES		
1.4.1	Switches (Pressure, DP, Level, Flow, Temperature etc)	1 Lot (10% of each type of total nos. used in the system or minimum 1 no. of each type, model & range whichever is more)	
1.5	Rotameter	1 Lot (10% of each type of total nos. used in the system or minimum 2 no. of each type, model & range whichever is more)	
1.6	SOLENOID VALVE		
1.6.1	Assembly	1 Lot (10% of total quantity used or minimum 2 no. of each type whichever is more)	
1.6.2	Coil	1 Lot (10% of toatal quantity used or 5 no. whichever is more)	
1.7	E/P Converter	1 Lot (10% of each type of total nos. used in the system or minimum 2 no. of each type, model & range whichever is more)	
1.8	SPECIAL INSTRUMENTS		
1.8.1	Nucleonic /non-nucleonic density meter, solid flow meter etc.	1 no. and spare parts as per manufacturer	
1.9	Electrical Transducers	1 Lot (10% of total quantity used or minium 1 no. of each type and range whichever is more)	

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2	POWER SUPPLY SYSTEM (24 V DC POWER SUPPLY SYSTEM)		
2.1	Silicon controlled thyristors, diodes power transistors	1 Lot (100%)	
3	PROCESS CONNECTION PIPING (for impulse piping /tubing, sampling piping/ tubing and air supply piping as applicable)		
3.1	Valves of all types and models	1 Lot (10% or 2 no. of each type, class, size and model whichever is more.)	
3.2	2 way, 3way, 5way valve manifolds	1 Lot (10% or 2 no. of each type, class, size and model whichever is more.)	
3.3	Fittings	1 Lot (10 nos. of each type)	
3.4	Purge meters	1 Lot (10 % of each model or 2 Nos. whichever is more)	
3.5	Filter regulators	1 Lot (10 % of each model or 2 Nos. whichever is more)	
3.6	Impulse pipe & tubing of all type	1 Lot (20 mtrs each type & size)	
3.7	Impulse line root valve	1 Lot (10% of total quantity used or 4 no. whichever is more for each type and rating of each size)	
3.8	SS tube	1 Lot (40 mtrs of each type/size)	
3.9	Fitting for SS tube	1 Lot (40 nos. of each type/size)	
4	INSTRUMENTATION CABLE, INTERNAL WIRING AND ELECTRICAL FIELD		
4.1	Pre fabricated cable of each type	1 Lot (10% of installed quantity)	
4.2	Pre fabricated cable connector	1 Lot (10% or 1no.of each type and model, whichever is more.)	
4.3	Other cables	1 Lot (10% of each type, pair and size of actual installed quantity)	
5	ELECTRICAL ACTUATORS		
5.1	Actuators	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.2	Power unit for modulating actuator	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	

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5.3	DC-DC unit/power pack units	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.4	Electronic cards	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.5	Brake assembly	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.6	Brake coils	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.7	Position feed back transmitters	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.8	Control unit	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.9	Torque and limit switch assembly of each unit	1 Lot (10% or 1 no. of each type, model and rating, whichever is more.)	
5.10	O-ring	1 Lot (1 set of each size)	
5.11	Motor	1 Lot (1 no. of each type & rating)	
5.12	Auxiliary contact	1 Lot (10% of total quantity used or 2 nos. whichever is more for each type and rating of each size)	
5.13	Seal kit	1 Lot (1 set of each type & size)	
6	RADAR TYPE LEVEL TRANSMITTER		
6.1	Transmitter/Receiver	1 Lot (10% or 1 no. of each type transmitter/ receiver)	
6.2	Electronic card	1 Lot (10% or 1 no. of each type electronic card)	
7	CONTROL VALVE		
7.1	NON-CRITICAL CONTROL VALVE	(a) 1 Lot (One set of spare control valve stem packing for each control valve.)	
		(b) 1 Lot (Two moulded rubber diaphragms for each control valve.)	
		(c) 1 Lot (2 no. of gasket for each type/size.)	
		(d) 1 Lot (100% quantity of lubricants for gaskets for each control valve on one year consumption basis.)	

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		(e) 1 Lot (2 set of limit switches for each control valve.)	
		(f) 1 Lot (One (1) set of valve trims (such as plug, stem, seat ring/cage, guide bushing, stem lock pin, packing retaining ring etc) for each control valve.)	
		(g) 1 Lot (One completes actuator of each type or min. 10% for each type and size whichever is more.)	
7.2	CRITICAL CONTROL VALVE (BFP RECIRCULATION VALVE, SUPERHEATER SPRAY VALVE, REHEATER SPRAY VALVE, SOOT BLOWER VALVE, PRDS STEAM PRESSURE REDUCING VALVE, FEED CONTROL VALVE		
7.2.1	Soft goods kit valve	1 set	
7.2.2	Metal seat	1 set	
7.2.3	Seat ring	1 set	
7.2.4	Spindle	1 set	
7.2.5	Actuator soft goods kit	1 set	
7.3	COMMON SPARES AND ACCESSORIES FOR ABOVE VALVE		
7.3.1	Feed back transmitter unit	1 Lot (10% of total quantity used or 2 nos. whichever is more for each type/rating)	
7.3.2	Electronic positioner	1 Lot (10% of total quantity used or 2 nos. whichever is more for each type/rating)	
7.3.3	Solenoid valve	1 Lot (10% of total quantity used or 2 nos. whichever is more for each type/rating)	
7.3.4	Air filter regulator	2 nos.	
7.3.5	Air lock relay	1 Lot (4 nos of each type)	
7.3.6	Complete actuator for each type and model	1 set	
7.3.7	Volume booster	1 Lot (2 no each type/size)	
8	CONTROL PANEL AND LOCAL/ REMOTE CONTROL DESK (AS APPLICABLE)		
8.1	Recorder	1 Lot (1(one) No. each type and model)	

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8.2	Bar graph indicator	1 Lot (10% of total quantity used in the system or minimum 1(one) no. whichever is more for each type and model.)	
8.3	Digital indicator	1 Lot (10% of total quantity used in the system or minimum 1(one) no. whichever is more for each type and model.)	
8.4	Mosaic/Conventional Type Push button Station	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)	
8.5	Mosaic Type Push button Station with LED Indication	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)	
8.6	Mosaic Type LED Indication Station	1 Lot (10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.)	
8.7	Simaphore Indicator	1 Lot (2(two)Nos. each type)	
8.8	ANNUNCIATION SYSTEM (For offsite / Auxiliary Plants)		
8.8.1	Each type of PCB (for non-PLC driven system)	1 Lot (1(one) No. each)	
8.8.2	Lamp Box with Facia & Lamps (LED type)	1 Lot (10% with minimum 2 nos.)	
8.8.3	Hooter	1 (one) No.	
9	Power cylinder		
9.1	Solenoid Coil for Pneumatic type Power Cylinder	1 Lot (5 Nos. for each type & ratings)	
9.2	Position Limit Switch for Pneumatictype Power Cylinder	1 Lot (10Nos. for each type & ratings)	
9.3	Air Lock Relay	1 Lot (10Nos. for each type)	
9.4	Signal Air Booster Unit	1 Lot (2Nos. for each type)	

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10	MANDATORY SPARES NOT COVERED ABOVE	Bidder to supply 10% electronic modules/ cards or any other electronic components required for system such as annunciation system for offsite/auxiliary plant, online condensate tube cleaning system, ambient air monitoring system, plant simulator.	
Notes:a) Mandatory spares listed in Price Schedule is bare minimum requirement. In case any additional mandatory spares requirement is covered elsewhere in the tender specification apart from specified above, same shall be deemed to have been covered in bidder's scope of supply. b) One set corresponds to actual quantity of components and devices as installed for the equipment at Site. c) All mandatory spares shall be supplied as per the requirement of the specifications. In case any spare indicated in the specification is "not applicable" for particular equipment, then suitable applicable alternate spare has been offered / shall be supplied by the bidder without any financial implication." d) Any item which is quoted as "not applicable" by the bidder in the above list and is found to be "applicable" at a later date shall be supplied by the bidder without any commercial and delivery implication. e) Any cell left blank in the unpriced schedule shall be treated as "Quoted" and is included in total price.			