

BOQ

NAME OF PROJECT:		1X660 MW PANKI TPS		
NAME OF PACKAGE:		VENTILATION SYSTEM		
TECHNICAL SPECIFICATION No:		PE-TS-426-554-A001		
S. No.	DESCRIPTION	UNIT	QTY	HSN/SAC CODE
1	Total lump sum firm price inclusive of all prevailing taxes, duties and other levies 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, 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 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 inclusive of all prevailing taxes, duties and other levies 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 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 inclusive of all prevailing taxes, duties and other levies 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 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 inclusive of all prevailing taxes, duties and other levies 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

BREAKUP (FOR MAIN PLANT, ESP AND OTHER AUX BUILDINGS)

NAME OF PROJECT:		1X660 MW PANKI TPS	
NAME OF PACKAGE:		VENTILATION SYSTEM	
TECHNICAL SPECIFICATION No:		PE-TS-426-554-A001	
SL NO	DESCRIPTION	Qty	UNIT
1	Sheet metal type air washer unit with centrifugal fan 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, etc. along with duct support for suction and discharge plenum as per specification of min 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 with motor, pumps with motors, filters, UAF internals, piping as per IS: 1239 pt I (heavy class galvanised), valves, nozzles, instruments, back wash arrangement, galvanised drain piping, etc. as per specification of capacity 80,000 CMH. Each UAF has 1 no centrifugal fan (1 x 100% duty) of each capacity 80,000 CMH at min. 50 mm SP.	2	Nos*
3*	Supply air ducting (finished) for above area complete with dampers, grills (with VCD & without VCD), supports (painted) and all accessories as specified.		
3.1*	Finished GSS (zinc coating 275 gms/sq.m) Ducting with support structure etc.		
a)*	18 G	4000	SQM*
b)*	20 G	1070	SQM*
c)*	22 G	2400	SQM*
d)*	24 G	1000	SQM*
3.2*	MS Duct With Epoxy paint for battery room.	120	SQM*
3.3*	MS Grilles with VCD	140	SQM*
3.4*	MS Grilles without VCD	12	SQM*
3.5*	Exposed duct insulation with finish as per specifications.	600	SQM*
3.6*	Wall mounted dampers (gravity operated) for different areas.	60	SQM*
3.7*	Inlet Louvres	200	SQM*
3.8*	Volume control dampers	27	SQM*
3.9*	FIRE DAMPER		
a)*	Fire damper	42	SQM*
b)*	Motorized Actuator with single phase power supply for the above Fire damper with auto resetting, limit switches, indication lamps etc	22	Nos.*
c)*	Fusible Link type Fire Damper	15	SQM*

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SL NO	DESCRIPTION	Qty	UNIT
4*	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	15	Nos.*
b)*	Capacity 40,000 CMH with Motor rating 5.5 KW	15	Nos.*
c)*	Capacity 20,000 CMH with Motor rating 2.2 KW	2	Nos.*
5*	Axial flow supply fans with pre and fine filter (wall mounted) complete with casing, TEFC sq cage induction motors & mounting frame, inlet and outlet cone, MS rain protection cowl, bird screen and all other accessories along with support structure (suitable for 415V/3-phase supply). Following fan shall have 30 mmwc static pressure.		
a)*	Capacity 10,000 CMH with Motor rating 2.2 KW	30	Nos.*
b)*	Capacity 7,500 CMH with Motor rating 1.5 KW	28	Nos.*
c)*	Capacity 6,000 CMH with Motor rating 1.1 KW	2	Nos.*
d)*	Capacity 4,000 CMH with Motor rating 0.75 KW	2	Nos.*
6*	Axial flow supply fans with pre filter (wall mounted) complete with casing, TEFC sq cage induction motors & mounting frame, MS rain protection cowl, inlet and outlet cone, bird screen and all other accessories along with support structure (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	26	Nos.*
b)*	Capacity 7,500 CMH with Motor rating 1.1 KW	20	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	2	Nos.*
7*	Axial flow exhaust fans (Bifurcated type, spark proof construction, wall mounted) complete with casing, flame proof motor & mounting frame, inlet and outlet cone, MS rain protection cowl, bird screen and all other accessories along with support structure 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	20	Nos.*
b)*	Capacity 10,000 CMH with Motor rating 1.5 KW	16	Nos.*
c)*	Capacity 7,500 CMH with Motor rating 1.1 KW	10	Nos.*
d)*	Capacity 4,000 CMH with Motor rating 0.55 KW	15	Nos.*
e)*	Capacity 2,000 CMH with Motor rating 0.55 KW	2	Nos.*
8*	Axial flow exhaust fans (Wall mounted) complete with casing, TEFC sq cage induction motor & mounting frame, MS rain protection cowl, inlet and outlet cone, bird screen and all other accessories along with support structure epoxy painted (suitable for 415V/3-phase supply) as specified. Following fan shall have 10 mmwc static pressure.		

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SL NO	DESCRIPTION	Qty	UNIT
a)*	Capacity 15,000 CMH with Motor rating 1.1 KW	40	Nos.*
b)*	Capacity 10,000 CMH with Motor rating 0.75 KW	38	Nos.*
c)*	Capacity 7,500 CMH with Motor rating 0.55 KW	2	Nos.*
d)*	Capacity 6,000 CMH with Motor rating 0.55 KW	2	Nos.*
e)*	Capacity 4,000 CMH with Motor rating 0.55 KW	8	Nos.*
f)*	Capacity 2,000 CMH with Motor rating 0.37 KW	2	Nos.*
9*	Exhaust fan (propeller type) completes with induction motor & mounting frame MS rain protection cowl, bird screen and all other accessories along with support structure, as required as specified (suitable for 240V/ 1 phase). Following fan shall have 5 mmwc static pressure.		
a)*	Capacity 1000 CMH with Motor rating 100 watts	180	Nos.*
10*	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 and all other accessories epoxy painted (suitable for 415V/3-phase supply) as specified. Following fan shall have 25 mmwc static pressure.		
a)*	Capacity 10,000 CMH with motor Rating 2.2 KW	4	Nos.*
b)*	Capacity 7,500 CMH with motor Rating 1.5 KW	2	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 without travelling trolley	4	Nos.*
c)*	1T chain pulley block with travelling trolley	2	Nos.*
12*	Online Non Chemical Scale Preventer,with all accessories required to meet system requirements for following areas		
a)*	For Air Washer Units of 'A' row & 'BC' bay	4	Nos.*
b)*	For Unitary Air Filtration Units of ESP Cum FGD building	2	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
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
15	FIELD INSTRUMENTS like pressure gauge, pressure transmitter, differential pressure switch, temperature indicator, levelswitch and other instrument required for Ventilation System.	1	LOT

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SL NO	DESCRIPTION	Qty	UNIT
16*	Providing full support during FAT of DDCMIS, preparation of control scheme, and commissioning of DDCMIS as per relevant specification.	21	Mandays*
17	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 be deemed to be included in above price

APPENDIX-A
Special tools & tackles for maintenance

NAME OF PROJECT:		1X660 MW PANKI TPS	
NAME OF PACKAGE:		VENTILATION SYSTEM	
TECHNICAL SPECIFICATION No:		PE-TS-426-554-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 PANKI TPS	
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TECHNICAL SPECIFICATION No:		PE-TS-426-554-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

NAME OF PROJECT:		1X660 MW PANKI STPP
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TECHNICAL SPECIFICATION No:		PE-TS-426-554-A001
I	MECHANICAL	
S.No.	Description	Quantity
1.00.00	Air washer unit (For Each Model and Capacity)	
1.01.00	Supply Air Fans	
1.01.01	Supply air fan	1 No.
1.01.02	V-belts for Supply air fans	4 Sets
1.01.03	Supply air fan bearings	2 Set
1.02.00	Air Washer pump	
1.02.01	Pump Impeller	1No.
1.02.02	Air washer pump	1 No.
1.02.03	Pump Bearing	2 Set
1.02.04	Shaft Sleeves	4 Nos.
1.02.05	Gland packings for pumps	4 Nos.
1.03.00	Metallic or Fabric (as applicable) Panel filters	1 Set (Quantity of suit one no. of air washer)
1.04.00	Spray nozzles	5% of total population or 10 numbers whichever is higher.
1.05.00	Flooding nozzles if applicable	5 % of total population or 2 numbers whichever is higher.
1.06.00	Air Washer Pump inlet water strainer	1 No.
1.07.00	Brass suction/screen strainer for air water tank	1 Set
2.00.00	Unitary air filtration unit (For Each Model and Capacity)	
2.01.00	Supply air fans	
2.01.01	Supply air fans	1 No.
2.01.02	V-belts for supply of fans	2 Sets
2.01.03	Supply of air fan bearings	1 Set
2.02.00	UAF Pump	

ANNEXURE - II
LIST OF MANDATORY SPARES

2.02.01	UAF Pump	1 No.
2.02.02	Pump Impeller	1 No.
2.02.03	Pump bearings	1 Set
2.02.04	Shaft sleeves	2 Nos.
2.02.05	Gland packings for pumps	2 Sets
2.03.00	Nylon Filter	1 Set
2.04.00	Spray nozzles	5% of total population or 5 numbers whichever is higher.
2.05.00	Water strainer	1 No.
2.06.00	Brass suction screen/strainer for unitary air filtration unit tank	1 Set
3.00.00	Mechanical ventilation system	
3.01.00	Roof exhauster fan (Of each type / Rating /Capacity)	5%of total population or 1 number whichever is higher
3.02.00	Supply air fan (wall mounted) (Of each type / Rating /Capacity)	5%of total population or 1 number whichever is higher
3.03.00	Exhauster Fan (Wall mounted) (Of each type / Rating /Capacity)	5%of total population or 1 number whichever is higher
4.00.00	Mechanical spares for Manual hoist	
4.01.00	Manual Hoists(Chain Pulley Block) (FOR EACH TYPE & CAPACITY)	
	a) All Bearings	1 set of each type / rating
	b) Brake assembly and its liners (as applicable)	1 set of each type / rating
ELECTRICAL:		
S.No.	Description	Quantity
1.01.00	415 V Motors	

ANNEXURE - II
LIST OF MANDATORY SPARES

1.01.01	Terminal plates	10 Nos. each for small motors upto 30 kW & 4 Nos. each for more than 30 kW
1.01.02	Heaters	2 sets
1.01.03	Greasing arrangements	4 sets each type of motor
1.01.04	Motor of each type and rating	10% of the installed quantity or minimum 1 number whichever be higher
1.01.05	Bearings (DE and NDE) for each type and rating of motors.	4 sets
1.01.06	Stator winding coils for all type of LT motors	One (1) set
1.01.07	Dust seals and gaskets for each type of motors	Three (3) sets

CONTROL & INSTRUMENTATION:

1.01.00	Measuring & Field Instruments	
1.01.01	Temperature Elements and Thermowells	
(i)	Thermocouple/RTD elements	5% of total duplex thermocouple element assemblies and duplex RTD assemblies (with head assembly, terminal block and nipple) of each type and length whichever is more. The element assembly shall be suitable for direct replacement in the corresponding thermowell.
(ii)	Thermowells	10% for each type of temperature sensors or a minimum of one for each type & size, whichever is more
1.01.02	Temperature Transmitters and Electronic Transmitters of all type, range and model no. (For Pressure, DP, Temp, Flow, Level), Process Transmitters, Radar type level transmitter, 3D type level Transmitter with local display, Magnetic/Electromagnetic flow meter with local display, mass flow meter with local display., Process meters, Junction Box, Position Transmitter, Transducer or any other instrument etc.	10% of total number of instruments/transducers offered for each model and type, rating or a minimum of one number for each model, rating and type , whichever is more.
	Process actuated switch Devices- As applicable for each package as per following:	
	1. Temperature Switches	

ANNEXURE - II
LIST OF MANDATORY SPARES

1.01.03	2. Differential pressure Switches	5% of total nos. or 1 no. of each make, model, range and type whichever is more
	3. Pressure switches	
	4. Flow switches	
	5. Level Switches	
	6. Safety Protection Switches	
1.01.04	Local Gauges like temperature gauges, pressure gauges, differential Pressure gauges, flow gauges, flow meters with local display etc.	10% of total number of instruments/transducers offered for each model and type, rating or a minimum of one number for each model, rating and type , whichever is more.
1.01.05	All type of Rota meters & Sight Flow Indicator.	1 no. of each range and type
1.01.06	PD Type flow transmitters with local display.	1 no. of each type and model
1.01.07	Any other instruments not indicated in the tender P&ID but required for control, monitoring and operation of the equipment/plant/systems	10% or 2 nos. of each type whichever is more
1.01.08	Level Gauges	
	a) 10% or 2 nos. whichever is more of each type of illuminators with holder and reflector.	
	b) 20% or 5 nos. whichever is more of each type of bulb.	
	c) 10% or 2 nos. whichever is more of each type of bi-color rollers.	
	d) 10% or 2 nos. whichever is more of each type of glass along with pair of gaskets (cushion & wet gaskets).	
	e) 10% or 2 nos. whichever is more of each type of gaskets for gauge cocks/valve bonnet/ packing.	
	f) 10% or 2 nos. whichever is more of each type scale.	

ANNEXURE - II
LIST OF MANDATORY SPARES

1.01.09	Erection hardware mounted in field, LIE & LIR	
1.01.09.01	Instrument valves, manifold, fittings, impulse pipe, impulse tubes, drains pipes etc.	Ten (10) percent of each type, rating, model number and size of devices.
1.01.09.02	Condensate pots of each type & Size installed	Ten (10) percent of total number of Installed or four numbers whichever is higher.
1.01.09.03	Manifold 2 way, 3 way, 5 way valve manifolds	Ten (10) percent of each type & Size installed
1.01.09.04	Fittings	Ten (10) percent of each type & Size installed
1.01.09.05	Purge meters	Ten (10) percent of each type & Size installed
1.01.09.06	Air Filter cum Regulator	Ten (10) percent of each type, make and model installed
1.01.09.07	MCB, and Power sockets used in LIE/LIR.	Ten (10) percent of each type
1.01.09.08	Fuses used in LIE/LIR.	Fifty (50) percent of each type of
1.01.10	Mandatory spares not covered above	
	10% or 1 no. (whichever is more) of each type of sensor/instrument, analysers /special instruments/ Electronic card, instrumentation/ mechanical fittings etc for any other electronic system.	
1.01.11	Spares for Electric actuators of Discharge Butterfly valves	
a)	Complete actuating assembly	1 set
1.01.12	Microprocessor based control system	
a)	Complete set including integral microprocessor based control system along with system & application software and special cables.	10% or 1 set of each type/model whichever is more

ANNEXURE - II
LIST OF MANDATORY SPARES

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