ANNEXURE-A

LIST OF ITEMS

Sr. No.	Item / Description	Quantity
1.	**Electric Motor Operated Control Valve for Atmosphere Release of Super-Heated Steam (Pressure Regulating Valve-PCV 01)** Specifications are as per attached Sheet	1 Nos.
2.	**Electric Motor Operated Control Valve for Atmosphere Release of Super-Heated Steam (Isolation Valve-PCV 02)** Specifications are as per attached Sheet	1 Nos.

Sr.No.1		Specifications of Electric Motor Operated Valve for Atmosphere Release of Super Heated Steam			
GENERAL	1	Service		Pressure Regulating (PCV-01)	
	2	Quantity		1	
	3	Design Code		ANSI B16.34 (latest release)	
	4	Test Code/ Standard		API 598	
	5	Line Size / Line Material		Ø133 X 13 mm 12 Cr 1 Mo VG	
VALVE	6	Type of Valve		Globe , Sketch is attached	
	7	Layout/ Installation		Installed at Steam Header of Coal Fired Power Plant	
	8	Valve size		DN100	
	9	Valve width		600 mm	
	10	End Connection		Butt welded	
	11	Pressure Rating		To be selected by the manufacturer	
	12	Valve Body Material		To be provided by manufacturer as per required service	
	13	Packing Material		To be provided by manufacturer as per required service	
	14	Bonnet Type		To be provided by manufacturer as per required service	
	15	Trim Material: Seat/ Plug		To be provided by manufacturer as per required service, material should be surface hardened	
	16	Trim Characteristics		Equal Percentage	
	17	Shaft Material		To be provided by manufacturer as per required service	
	18	Required Seat Tightness		Zero leakage across seat	
Actuator	19	Type of Actuator		Motorized Actuator	
	20	Elect. Satety Class		IP-65 or above	
	21	Normal Position		Closed	
	22	Fail Safe Position		Fail As Is	
	23	Hand Wheel / Location		Required	
	24	Control Signal		Analog 4-20mA, (0-100 %)	
	25	Number of Torque Switches		2	
	26	Number of Limit Switches		2	
	27	Position Transmitter		Analog 4-20mA, (0-100 %)	
	28	Local Operation		Yes Both Local & Remote Operation is required	
	29	Stroke Time		60 Sec	
	30	Control Cable Type & Gland Size		To be provided by manufacturer	
MOTOR	31	Design Code		NEMA MG-1	
	32	Electrical Rating (KW)		To be provided by manufacturer	
	33	Rated Voltage		380 V, 50 Hz ,3 Phase	
	34	Duty Type		S2	
	35	Locked Rotor Current		To be provided by manufacturer	
	36	Efficiency		To be provided by manufacturer	
	37	Torque Rated/ Lock Rotor		To be provided by manufacturer	
	38	Power Factor		To be provided by manufacturer	
	39	Service Factor		1.1	
	40	Insulation class		F	
	41	Terminal box & Internal wiring		Yes, Required	
	42	Space Heater		To be provided by manufacturer	
	43	Power Cable Type & size		To be provided by manufacturer	
	44	Enclosure/ Protection Class		NEMA 4	
	45	Ambient Conditions		-3 to 60 degree C, humidy: 100%	
SERVICE	46	Fluid		Super heated steam	
	47	Maximum Flow Rate		70 T/hr.	
	48	Max Inlet Pressure/Outlet		13 MPa/ Atmosphere	
	49	Operating Flow Rate		0-70 T/hr	
	50	Norma Inlet Pressure	DP	9.8 MPa	9.8 MPa
	51	Temp. Max	Operating	575 degree C	540 degree C
	52	Manufacturer		Europe /USA/ joint venture (Flowserve/ Wood/ EGE/ Fisher/ Locke/ Equivalent)	

Sr.No.2	Specifications of Electric Motor Operated valve for Atmosphere Release of Super Heated Steam				
GENERAL	1	Service		Isolation (PCV-02)	
	2	Quantity		1	
	3	Design Code		ANSI B16.34 (latest release)	
	4	Test Code/ Standard		API 598	
	5	Line Size / Line Material		Ø133 X 13 mm 12 Cr 1 Mo VG	
VALVE	6	Type of Valve		Globe 45° (Angle b/w stem & steam outlet), Sketch is attached	
	7	Layout/ Installation		Installed at Steam Header of Coal Fired Power Plant	
	8	Valve size		DN100	
	9	Valve width		600 mm	
	10	End Connection		Butt welded	
	11	Pressure Rating		To be selected by the manufacturer	
	12	Valve Body Material		To be provided by manufacturer as per required service	
	13	Packing Material		To be provided by manufacturer as per required service	
	14	Bonnet Type		To be provided by manufacturer as per required service	
	15	Trim Material: Seat/ Plug		To be provided by manufacturer as per required service, material should be surface hardened	
	16	Trim Characteristics		Equal Percentage	
	17	Shaft Material		To be provided by manufacturer as per required service	
	18	Required Seat Tightness		Zero leakage across seat	
Actuator	19	Type of Actuator		Motorized Actuator	
	20	Elect. Satety Class		IP-65 or above	
	21	Normal Position		Closed	
	22	Fail Safe Position		Fail As Is	
	23	Hand Wheel / Location		Required	
	24	Control Signal		Analog 4-20mA, (0-100 %)	
	25	Number of Torque Switches		4	
	26	Number of Limit Switches		4	
	27	Position Transmitter		Analog 4-20mA, (0-100 %)	
	28	Local Operation		Yes Both Local & Remote Operation is required	
	29	Stroke Time		30 Sec	
	30	Control Cable Type & Gland Size		To be provided by manufacturer	
MOTOR	31	Design Code		NEMA MG-1	
	32	Electrical Rating (KW)		To be provided by manufacturer	
	33	Rated Voltage		380 V, 50 Hz ,3 Phase	
	34	Duty Type		S2	
	35	Locked Rotor Current		To be provided by manufacturer	
	36	Efficiency		To be provided by manufacturer	
	37	Torque Rated/ Lock Rotor		To be provided by manufacturer	
	38	Power Factor		To be provided by manufacturer	
	39	Service Factor		1.1	
	40	Insulation class		F	
	41	Terminal box & Internal wiring		Yes, Required	
	42	Space Heater		To be provided by manufacturer	
	43	Power Cable Type & size		To be provided by manufacturer	
	44	Enclosure/ Protection Class		NEMA 4	
	45	Ambient Conditions		-3 to 60 degree C, humidy: 100%	
SERVICE	46	Fluid		Super heated steam	
	47	Maximum Flow Rate		70 T/hr.	
	48	Max Inlet Pressure/Outlet		13 MPa/ Atmosphere	
	49	Operating Flow Rate		0-70 T/hr	
	50	Norma Inlet Pressure	DP	9.8 MPa	9.8 MPa
	51	Temp. Max	Operating	575 degree C	540 degree C
	52	Manufacturer		Europe /USA / joint venture (Flowserve/ Wood/ EGE/ Fisher/ Locke/ Equivalent)	

Note:

1. Munufacturer must provide drawings of the valve & actuator
2. Munufacturer also provide material of construction
3. Flow & Pressure Vs Valve opening chart/ curve must be provided with quotation
4. Munufacturer must provide flow Coefficient Cv
5. Material of valve body must be compatible with the piping material for welding
6. Following test must be performed and provision of certificates
   - i Hydrostatic Test
   - ii Seat leakage Test
   - iii Valve Closure Test
   - iv Stroking and step response test
   - v NDT Flaw Test (UT)
   - vi Flow Characteristics Curve with Actuator
   - vii Winding Resistance Test of Actuator Motor
   - viii Insulation Resistance Test of Actuator Motor
   - ix No Load Test of Actuator Motor
   - x High Voltage Test of Actuator Motor
   - xi Rotor Balancing Test of Actuator Motor
7. Necessary calibration tools must also be provided
8. Manufacturer must also provide 01 complete set of necessary spares for Valve & Actuator
9. All the documents should be supplied in English.
10. Manufacturer shall provide the warranty of 2 years (minimum)

INSTALLED SKETCH OF PRESSURE CONTROL VALVES (PCV 1&2)