

**SCHEDULE No. 1A: Plant and Mandatory Spares Supplied from Abroad  
+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station**

Item	Description	Qty.	Country of Origin	Unit Price	Total Price	Taxes and Duties
				CIP (PKR)	(PKR)	PKR
1	2	3	4	5	6=3x5	7
1	<p>Design, Manufacture and Supply, of +150/-50MVAR Static Var Compansator (SVC), capable of high-speed response to control system transient voltage stability, plant having major equipment like Transformer, Thyristor Controlled Reactor (TCR) , Thyristor Switched Capacitors (TSC), Harmonic Filters, circuit breakers, instrument transformers, disconnectors, fast acting controllers, cooling system, plant protection etc.</p> <p>The design of SVC shall meet the operational and system dynamic requirements, specified in specification and harmonic/power quality survey results attached herewith, using any configuration of Thyristor Controlled Reactors (TCR), Thyristor Switched Capacitors (TSC), fixed capacitors and harmonic filter circuits. The full dynamic range shall consist of thyristor controlled reactors and/or thyristor switched capacitors except fixed capacitors. Temporary overload of specific components shall also be considered. The harmonic filter requirements have to be fulfilled over the whole reactive power range for harmonic emission from the grid as well as SVC system. (Complete in all respect, along with all allied facilities.</p>	Lot				
2	Training as per Annexure-E	Lot				
3	O&M supervision as per Annexure-F	Lot				
<b>Total Column 6 to be carried forward to Grand Summary.</b>						

1. Wherever, the word "Lot" has been used in the above schedule the supplier is required to provide the brief detail and cost of components.

2. Any other item deemed necessary by the bidder for the successful completion of the project as per design and not mentioned above may also be quoted separately but its application will be subject to the approval of engineer/employer.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 1B: Plant and Mandatory spares Supplied from Abroad  
+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty.	Country of Origin	Unit Price	Total Price	Taxes and Duties
				CIP (PKR)	(PKR)	PKR
1	2	3	4	5	6=3x5	7
1	<p>Design, Manufacture and Supply of +150/-50MVAR Static Var Compansator (SVC), capable of high-speed response to control system transient voltage stability, plant having major equipment like Transformer, Thyristor Controlled Reactor (TCR) , Thyristor Switched Capacitors (TSC), Harmonic Filters, circuit breakers, instrument transformers, disconnectors, fast acting controllers, cooling system, plant protection etc.</p> <p>The design of SVC shall meet the operational and system dynamic requirements, specified in specification and harmonic/power quality survey results attached herewith, using any configuration of Thyristor Controlled Reactors (TCR), Thyristor Switched Capacitors (TSC), fixed capacitors and harmonic filter circuits. The full dynamic range shall consist of thyristor controlled reactors and/or thyristor switched capacitors except fixed capacitors. Temporary overload of specific components shall also be considered. The harmonic filter requirements have to be fulfilled over the whole reactive power range for harmonic emission from the grid as well as SVC system. (Complete in all respect, along with all alied facilities.</p>	Lot				
2	Training as per Annexure-E	Lot				
3	O&M supervision as per Annexure-F	Lot				
<b>Total Column 6 to be carried forward to Grand Summary.</b>						

1. Wherever, the word "Lot" has been used in the above schedule the supplier is required to provide the brief detail and cost of components.

2. Any other item deemed necessary by the bidder for the successful completion of the project as per design and not mentioned above may also be quoted separately but its application will be subject to the approval of engineer/employer.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 2A: Plant and Mandatory Spare supplied from within the Employer's Country**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station**

Item	Description	Qty.	EXW Unit Price	Total EXW Price	Sales Tax	Total Price
1	2	3	4	5=3x4	6	7
1	Design, Manufacture and Supply of +150/-50 MVAR Static Var Compensator (SVC), capable of high-speed response to control system transient voltage stability, plant having major equipment like Transformer, Thyristor Controlled Reactor (TCR) , Thyristor Switched Capacitors (TSC), Harmonic Filters, circuit breakers, instrument transformers, disconnectors, fast acting controllers, cooling system, plant protection etc.  The design of SVC shall meet the operational and system dynamic requirements, specified in specification and harmonic/power quality survey results attached herewith, using any configuration of Thyristor Controlled Reactors (TCR), Thyristor Switched Capacitors (TSC), fixed capacitors and harmonic filter circuits. The full dynamic range shall consist of thyristor controlled reactors and/or thyristor switched capacitors except fixed capacitors. Temporary overload of specific components shall also be considered. The harmonic filter requirements have to be fulfilled over the whole reactive power range for harmonic emission from the grid as well as SVC system. (Complete in all respect, along with all allied facilities.	Lot				
2	Training as per Annexure-E	Lot				
3	O&M supervision as per Annexure-F	Lot				
<b>Total Column 7 to be carried forward to Grand Summary.</b>						

1. Wherever, the word "Lot" has been used in the above schedule the supplier is required to provide the brief detail and cost of components.

2. Any other item deemed necessary by the bidder for the successful completion of the project as per design and not mentioned above may also be quoted separately but its application will be subject to the approval of engineer/employer.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 2B: Plant and Mandatory Spare supplied from within the Employer's Country**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty.	EXW Unit Price	Total EXW Price	Sales Tax	Total Price
1	2	3	4	5=3x4	6	7
1	<p>Design, Manufacture, Supply, installation, testing &amp; commissioning of +150/-50MVAR Static Var Compansator (SVC), capable of high-speed response to control system transient voltage stability, plant having major equipment like Transformer, Thyristor Controlled Reactor (TCR) , Thyristor Switched Capacitors (TSC), Harmonic Filters, circuit breakers, instrument transformers, disconnectors, fast acting controllers, cooling system, plant protection etc.</p> <p>The design of SVC shall meet the operational and system dynamic requirements, specified in specification and harmonic/power quality survey results attached herewith, using any configuration of Thyristor Controlled Reactors (TCR), Thyristor Switched Capacitors (TSC), fixed capacitors and harmonic filter circuits. The full dynamic range shall consist of thyristor controlled reactors and/or thyristor switched capacitors except fixed capacitors. Temporary overload of specific components shall also be considered. The harmonic filter requirements have to be fulfilled over the whole reactive power range for harmonic emission from the grid as well as SVC system. (Complete in all respect, along with all allied facilities.</p>	Lot				
2	Training as per Annexure-E	Lot				
3	O&M supervision as per Annexure-F	Lot				
<b>Total Column 7 to be carried forward to Grand Summary.</b>						

1. Wherever, the word "Lot" has been used in the above schedule the supplier is required to provide the brief detail and cost of components.

2. Any other item deemed necessary by the bidder for the successful completion of the project as per design and not mentioned above may also be quoted separately but its application will be subject to the approval of engineer/employer.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 3A: Design Services**  
**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station**

Item	Description	Qty.	Unit Price	Total Price	PST PRICE	TOTAL
			PKR	PKR	PKR	PKR
1	2	3	4	5=3x4	6	7=5+6
1	The design of +150/-50 MVAR SVC capable of highspeed response to control system transient voltage stability, which shall meet the operational and system dynamic requirements, specified in specification and harmonic/power quality survey results attached herewith, using any configuration of Thyristor Controlled Reactors (TCR), Thyristor Switched Capacitors (TSC), fixed capacitors and harmonic filter circuits. The full dynamic range shall consist of thyristor controlled reactors and/or thyristor switched capacitors except fixed capacitors. Temporary overload of specific components shall also be considered. The harmonic filter requirements have to be fulfilled over the whole reactive power range for harmonic emission from the grid as well as SVC system, complete in all aspects along with all allied facilities as per international practice, ready to use,	Lot				
2	Design of associated civil works to house and install the plant supplied as per schedule 1 or 2 above Including civil works as per schedule No.4 The Contractor/Bidder is required to design the civil works according to the requirements (Building Code) of the relevant seismic zone issued by Government of Pakistan. In this context the Contractor/Bidder may obtain the relevant information from Earthquake Rehabilitation and Reconstruction Authority-ERRA (www.erra.gov.pk)	Lot				
<b>Total Column 5 to be carried forward to Grand Summary.</b>						

Note: The Bidder will have to provide the Breakup cost of the Design activities, if required by the Engineer/Employer, before award of the Contract.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 3B: Design Services**  
**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty.	Unit Price	Total Price	PST PRICE	TOTAL
			PKR	PKR	PKR	PKR
1	2	3	4	5=3x4	6	7=5+6
1	The design of +150/-50MVAR SVC capable of highspeed response to control system transient voltage stability, which shall meet the operational and system dynamic requirements, specified in specification and harmonic/power quality survey results attached herewith, using any configuration of Thyristor Controlled Reactors (TCR), Thyristor Switched Capacitors (TSC), fixed capacitors and harmonic filter circuits. The full dynamic range shall consist of thyristor controlled reactors and/or thyristor switched capacitors except fixed capacitors. Temporary overload of specific components shall also be considered. The harmonic filter requirements have to be fulfilled over the whole reactive power range for harmonic emission from the grid as well as SVC system, complete in all aspects along with all allied facilities as per international practice, ready to use,	Lot				
2	Design of associated civil works to house and install the plant supplied as per schedule 1 or 2 above Including civil works as per schedule No.4 The Contractor/Bidder is required to design the civil works according to the requirements (Building Code) of the relevant seismic zone issued by Government of Pakistan. In this context the Contractor/Bidder may obtain the relevant information from Earthquake Rehabilitation and Reconstruction Authority-ERRA (www.erra.gov.pk)	Lot				
<b>Total Column 5 to be carried forward to Grand Summary.</b>						

Note: The Bidder will have to provide the Breakup cost of the Design activities, if required by the Engineer/Employer, before award of the Contract.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 4A: Installation and Other Services (including civil works)  
+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station**

Item	Description	Qty.	Unit Price	Total Price	PST Price	Total
			PKR	PKR	PKR	PKR
1	2	3	4	5=3x4	6	7=5+6
1	Installation, testing and commissioning of the plant to be supplied against schedule No. 1 or 2.	Lot				
2	Construction (as per NTDC spec.) of associated civil works including control house building, office building transformers foundations, gantries foundations, transformer way, switch yard fence with gate, trenches, draw pit, approach road (within premises of the Plant), water supply and sewerage system including septic tank and collecting tank, etc., Complete in all aspects along with all allied facilities as per international practice, ready to use, and install the plant supplied as per schedule 1 or 2. Please refer to Supplementary Information, Section-6 for detail scope.	Lot				
3	Inland transportation and other incidental charges	Lot				
<b>Total Column 5 to be carried forward to Grand Summary.</b>						

1. Wherever, the word "Lot" has been used in the above schedule the supplier is required to provide the brief detail and cost of components.

2. All Civil Works to be carried out as per approved drawings by the Engineer.
3. The Contractor shall be paid for actual quantities installed with the unit rates given in the Bill of quantities.
4. The Contractor shall take all safeguards at site for safety/security of men, material and machinery at his own responsibility and cost.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

**SCHEDULE No. 4B: Installation and Other Services (including civil works)  
+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty.	Unit Price	Total Price	PST Price	Total Price
			PKR	PKR	PKR	PKR
1	2	3	4	5=3x4	6	7=5+6
1	Installation, testing and commissioning of the plant to be supplied against schedule No. 1 or 2.	Lot				
2	Construction (as per NTDC spec.) of associated civil works including control house building, office building transformers foundations, gantries foundations, transformer way, switch yard fence with gate, trenches, draw pit, approach road (within premises of the Plant), water supply and sewerage system including septic tank and collecting tank, etc., Complete in all aspects along with all allied facilities as per international practice, ready to use, and install the plant supplied as per schedule 1 or 2. Please refer to Supplementary Information, Section-6 for detail scope.	Lot				
3	Inland transportation and other incidental charges	Lot				
<b>Total Column 5 to be carried forward to Grand Summary.</b>						

1. Wherever, the word "Lot" has been used in the above schedule the supplier is required to provide the brief detail and
2. All Civil Works to be carried out as per approved drawings by the Engineer.
3. The Contractor shall be paid for actual quantities installed with the unit rates given in the Bill of quantities.
4. The Contractor shall take all safeguards at site for safety/security of men, material and machinery at his own responsibility and cost.

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_



**SCHEDULE No. 5 Grand Summary**  
**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old and 132kV Panjgoor**  
**Grid Station**

Item	Description	PKR in millions
1	Schedule 1(A to B): Plant and Mandatory Spare Parts Supplied from Abroad	
2	Schedule 2(A to B): Plant and Mandatory Spare Parts Supplied from Within the Employer's Country	
3	Schedule 3(A to B): Design Services	
4	Schedule 4(A to B): Installation and Other Services including Civil Works Including Inland Transportation	
5	Provisional Sum	<b>300</b>
<b>Grand Total to be carried forward to Letter of Bid</b>		

Name Of Bidder : \_\_\_\_\_

Signature of Bidder : \_\_\_\_\_

## Mandatory Spare Parts

### +150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
<b>1</b>	<b>Control System</b>					
1	Central processor unit	1				
2	Digital I/O card	1				
3	Digital I/O card	1				
4	Digital I/O card for trigger set	1				
5	Profibus communication card	1				
6	LAN card	1				
7	FLASH Memory Card	3				
8	I/O module	1				
9	I/O module	1				
10	Control cable	1				
11	Control cable	1				
12	Logic module	1				
13	Voltage to voltage transformer	1				
14	Current to voltage transformer	1				
15	Varistor	1				
16	RS232/TTY converter	1				
17	POWER OPTOCOUPLER	1				
18	INPUT OPTICAL COUPLER DEK-OE	1				
19	PLC TERMINAL PLC-RSC-24DC/21 Relay module	1				
20	OPTOCOUPLER EMG10-OV, 110VDC, 1A	1				
21	VARIOFACE MODULE FLK-D37 SUB/B Special terminal block	1				
22	UNIVERSAL ISOLATING AMPLIFIER	1				
23	CONTACTOR RELAY, 3NO+1NC, Auxiliary Relay	1				
24	6MD High Voltage Interface Unit I/O unit	1				
25	Time synchronization system	1				
26	LAN switch	1				
27	Plug for Profibus connection	1				
28	Control unit power supply	1				
29	RS232-RS485 converter	1				
30	Fan	1				
31	LAN switch	1				
<b>2</b>	<b>Protection System</b>					
1	Transformer differential protection	1				
2	Numerical overcurrent protection relay	1				
3	Numerical overcurrent protection relay	1				
4	Capacitor protection relay	1				
5	Lock out Relay	1				
6	Trip supervision relay	1				
7	DIODE-MODUL	1				
8	Voltage supervision relay	1				
9	Auxiliary relay 2NO+2NC, DC 24V	1				
10	Auxiliary relay 2NO+2NC, DC 110V	1				
11	Auxiliary switch block	1				
12	Relay module	1				
13	FAULT ANNUNCIATOR	1				

**Mandatory Spare Parts**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station**

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
14	FT 1 Testswitch	1				
<b>3</b>	<b>HMI System</b>					
1	Rack PC	1				
<b>4</b>	<b>Digital Fault Recorder</b>					
1	DDAU Module (DC Data Acquisition Unit) type Input module for DC values	1				
2	VDAU Module (Voltage Data Acquisition Unit) type Input module for voltages	1				
3	CDAU Module (Current Data Acquisition Unit) type Input module for currents	1				
4	Ethernet communication card	1				
5	Central processor unit	1				
6	Synchronizing unit	1				
<b>5</b>	<b>Power Supply C&amp;P</b>					
1	Net filter SIFI C 10 A, 250 V	1				
2	Net filter SIFI C 1 A, 250 V	1				
3	Net filter SIFI C 6 A, 250 V	1				
4	CIRC.BR. CURRENT SENS. T55 4.5KA 1-P C1 MCB	1				
5	CIRC.BR. CURRENT SENS. T55 4.5KA 1-P C6 MCB	1				
6	CIRC.BR. CURRENT SENS. T55 4.5KA 1-P C10 MCB	1				
7	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C1 MCB	1				
8	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C0 MCB	1				
9	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C6 MCB	1				
10	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C4 MCB	1				
11	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C10 MCB	1				
12	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C16 MCB	1				
13	AUXILIARY SWITCH 1S+1OE F.5SX	1				
14	Powertronic C354-H-L-R DC/DC chopper	1				
15	Powertronic C354-H-L-R-WM DC/DC chopper	1				
16	Powertronic C554-H-L-R DC/DC chopper	1				
17	Powertronic C658-H-L-R-U DC/DC chopper	1				
18	Powertronic C659-H-L-R-U (48V) DC/DC chopper	1				
19	1 set of terminals	1				
<b>6</b>	<b>Thyristor Valve &amp; Valve Base Electronic</b>					
	Items and quantities per each thyristor branch					
1	Thyristor, 5 inch type	3				
2	Snubber capacitor	2				
3	DC grading resistor	4				
4	Snubber resistor	4				
5	Optical fiber, connecting multi mode star coupler and thyristor	5				
6	Thyristor voltage monitoring board	2				

**Mandatory Spare Parts**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Gawadar Old Grid Station**

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
7	Set of spare parts for valve cooling system	1				
8	Fiber optic adapter for firing check fiber optics (2pcs)	1				
9	Fiber optic plug connector for firing check fiber optics	2				
	Valve base electronics rack:					
10	Microcontroller printed circuit board	1				
11	Light emitter printed circuit board	1				
12	Light receiver printed circuit board	1				
13	Adapter module printed circuit board	1				
<b>7</b>	<b>Capacitors</b>					
1	STF1 Capacitor	3				
2	STF2 Capacitor	3				
3	Surge capacitor	1				
4	Set of rack insulators	1				
<b>8</b>	<b>Reactors</b>					
1	TCR Reactor (half coil)	0				
2	STF Reactor	0				
3	STF Resistor	1				
4	Set of spare insulators	1				
<b>9</b>	<b>Power Transformer</b>					
1	HV-Bushing	1				
2	LV Bushing	1				
3	Oil and winding temp. Indicator	1				
4	Winding temperature indicator	1				
5	Gas relay	1				
6	Gasket set	1				
<b>10</b>	<b>Surge Arrester</b>					
1	HV Surge arrester	1				
2	LV Surge arresstor	1				
<b>11</b>	<b>MV - Switch Gear Unit</b>					
1	Spare part package	1				
<b>12</b>	<b>Thyristor Cooling Plant</b>					
1	Pump fine water circuit	1				
3	Level Switch (expansion tank)	1				
4	Ion Exchanger	1				
5	Ion Exchanger resin filling	1				
6	Conductance meter	1				
7	Solenoid valve	1				
8	Filter cartridges	1				
9	Digital thermometer	1				
10	Digital pressure gauge	1				
11	Flow meter fine water circuit	1				
12	Set control spares	1				
<b>13</b>	<b>Miscellaneous</b>					
1	Set AC/DC Supply spares	1				

**Mandatory Spare Parts**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
<b>1</b>	<b>Control System</b>					
1	Central processor unit	1				
2	Digital I/O card	1				
3	Digital I/O card	1				
4	Digital I/O card for trigger set	1				
5	Profibus communication card	1				
6	LAN card	1				
7	FLASH Memory Card	3				
8	I/O module	1				
9	I/O module	1				
10	Control cable	1				
11	Control cable	1				
12	Logic module	1				
13	Voltage to voltage transformer	1				
14	Current to voltage transformer	1				
15	Varistor	1				
16	RS232/TTY converter	1				
17	POWER OPTOCOUPLER	1				
18	INPUT OPTICAL COUPLER DEK-OE	1				
19	PLC TERMINAL PLC-RSC-24DC/21 Relay module	1				
20	OPTOCOUPLER EMG10-OV, 110VDC, 1A	1				
21	VARIOFACE MODULE FLK-D37 SUB/B Special terminal block	1				
22	UNIVERSAL ISOLATING AMPLIFIER	1				
23	CONTACTOR RELAY, 3NO+1NC, Auxiliary Relay	1				
24	6MD High Voltage Interface Unit I/O unit	1				
25	Time synchronization system	1				
26	LAN switch	1				
27	Plug for Profibus connection	1				
28	Control unit power supply	1				
29	RS232-RS485 converter	1				
30	Fan	1				
31	LAN switch	1				
<b>2</b>	<b>Protection System</b>					
1	Transformer differential protection	1				
2	Numerical overcurrent protection relay	1				
3	Numerical overcurrent protection relay	1				
4	Capacitor protection relay	1				
5	Lock out Relay	1				
6	Trip supervision relay	1				
7	DIODE-MODUL	1				
8	Voltage supervision relay	1				
9	Auxiliary relay 2NO+2NC, DC 24V	1				
10	Auxiliary relay 2NO+2NC, DC 110V	1				
11	Auxiliary switch block	1				
12	Relay module	1				

**Mandatory Spare Parts**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
13	FAULT ANNUNCIATOR	1				
14	FT 1 Testswitch	1				
<b>3</b>	<b>HMI System</b>					
1	Rack PC	1				
<b>4</b>	<b>Digital Fault Recorder</b>					
1	DDAU Module (DC Data Acquisition Unit) type Input module for DC values	1				
2	VDAU Module (Voltage Data Acquisition Unit) type Input module for voltages	1				
3	CDAU Module (Current Data Acquisition Unit) type Input module for currents	1				
4	Ethernet communication card	1				
5	Central processor unit	1				
6	Synchronizing unit	1				
<b>5</b>	<b>Power Supply C&amp;P</b>					
1	Net filter SIFI C 10 A, 250 V	1				
2	Net filter SIFI C 1 A, 250 V	1				
3	Net filter SIFI C 6 A, 250 V	1				
4	CIRC.BR. CURRENT SENS. T55 4.5KA 1-P C1 MCB	1				
5	CIRC.BR. CURRENT SENS. T55 4.5KA 1-P C6 MCB	1				
6	CIRC.BR. CURRENT SENS. T55 4.5KA 1-P C10 MCB	1				
7	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C1 MCB	1				
8	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C0 MCB	1				
9	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C6 MCB	1				
10	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C4 MCB	1				
11	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C10 MCB	1				
12	CIRC.BR. CURRENT SENS. T55 4.5KA 2-P C16 MCB	1				
13	AUXILIARY SWITCH 1S+1OE F.5SX	1				
14	Powertronic C354-H-L-R DC/DC chopper	1				
15	Powertronic C354-H-L-R-WM DC/DC chopper	1				
16	Powertronic C554-H-L-R DC/DC chopper	1				
17	Powertronic C658-H-L-R-U DC/DC chopper	1				
18	Powertronic C659-H-L-R-U (48V) DC/DC chopper	1				
19	1 set of terminals	1				
<b>6</b>	<b>Thyristor Valve &amp; Valve Base Electronic</b>					
	Items and quantities per each thyristor branch					
1	Thyristor, 5 inch type	3				
2	Snubber capacitor	2				
3	DC grading resistor	4				

**Mandatory Spare Parts**

**+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
4	Snubber resistor	4				
5	Optical fiber, connecting multi mode star coupler and thyristor	5				
6	Thyristor voltage monitoring board	2				
7	Set of spare parts for valve cooling system	1				
8	Fiber optic adapter for firing check fiber optics (2pcs)	1				
9	Fiber optic plug connector for firing check fiber optics	2				
	Valve base electronics rack:					
10	Microcontroller printed circuit board	1				
11	Light emitter printed circuit board	1				
12	Light receiver printed circuit board	1				
13	Adapter module printed circuit board	1				
<b>7</b>	<b>Capacitors</b>					
1	STF1 Capacitor	3				
2	STF2 Capacitor	3				
3	Surge capacitor	1				
4	Set of rack insulators	1				
<b>8</b>	<b>Reactors</b>					
1	TCR Reactor (half coil)	0				
2	STF Reactor	0				
3	STF Resistor	1				
4	Set of spare insulators	1				
<b>9</b>	<b>Power Transformer</b>					
1	HV-Bushing	1				
2	LV Bushing	1				
3	Oil and winding temp. Indicator	1				
4	Winding temperature indicator	1				
5	Gas relay	1				
6	Gasket set	1				
<b>10</b>	<b>Surge Arrester</b>					
1	HV Surge arrester	1				
2	LV Surge arrester	1				
<b>11</b>	<b>MV - Switch Gear Unit</b>					
1	Spare part package	1				
<b>12</b>	<b>Thyristor Cooling Plant</b>					
1	Pump fine water circuit	1				
3	Level Switch (expansion tank)	1				
4	Ion Exchanger	1				
5	Ion Exchanger resin filling	1				
6	Conductance meter	1				
7	Solenoid valve	1				
8	Filter cartridges	1				
9	Digital thermometer	1				
10	Digital pressure gauge	1				
11	Flow meter fine water circuit	1				
12	Set control spares	1				
<b>13</b>	<b>Miscellaneous</b>					

**Mandatory Spare Parts****+150/-50 MVAR Static VAR Compensator (SVC) at 132kV Panjgoor Grid Station**

Item	Description	Qty	Unit Price		Total Price	
			EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)	EXW Local Parts Local Currency (PKR)	CIP Imported Parts Local Currency (PKR)
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
1	Set AC/DC Supply spares	1				



## Training Schedule

The Contractor /Manufacturer/Supplier shall provide Operation and Maintenance (O&M) on job training to NTDC nominated Engineers and technical staff. In this context the person deputed by the Contractor /Manufacturer/Supplier for O&M supervision of the installed Plant (as per Annexure-F) shall also be responsible for the above mentioned training. Furthermore, the Contractor/Manufacturer shall also recommend the workforce required for O&M services of the Plant.

## OPERATION AND MAINTANANCE (O&M) SUPERVISION

The Contractor/ Manufacturer/ Supplier shall provide Operation and Maintenance (O&M) services of the installed Plant for the first three (03) months of its operation. In this context the Manufacturer shall depute one of its Engineer/Expert for supervision of O&M services of the Plant. The period of O&M services shall start from the issuance of Operational Acceptance Certificate.