

ANNEXURE -V

Project : 765kV/400/220kV S/S BHUJ POOL

Customer : POWERGRID CORPORATION OF INDIA LTD.

	List of Mandatory Spares	Unit	Qty
A)	765KV SF6 CB		
II	765 kV SF6 Circuit Breaker		
1	One complete pole of 765 kV CB with PIR including Grading Capacitor, Pole column, Interrupter, driving mechanism and Marshaling Box without support structure	Lot	1
2	Grading capacitor (if applicable)	No	1
3	Rubber gasket, 'O' rings and seal (For Complete replacement for one phase)	Set	1
4	Trip coils with resistor	Nos.	3
5	Closing coils with resistor	Nos.	3
6	Terminal Pad	Nos.	2
7	Molecular filter (For Complete replacement for one phase)	Nos	2
8	Corona Rings	Nos	1
9	Relay Power contactors, switch fuse units, limit switches, push button, timers & MCB etc (One No. of each Type)	Set	1
10.0	Pressure switch of each type/Density monitor (One No. of each Type)	Set	1
11.0	Auxiliary switch assembly (For one Phase of CB)	Set	1
B)	420kV, 125Mvar Bus Reactor		
1.0	Buchholz relay complete with contacts	nos.	1
2.0	Local WTI with sensing device and contacts	nos.	1
3.0	Remote WTI with sensing device and contacts	nos.	1
4.0	Oil temperature indicator (OTI) with contacts and sensing device	nos.	1
5.0	420kV Bushing with metal parts and gaskets along with lifting tools	Set	1
6.0	145kV Bushing with metal parts and gaskets along with lifting tools	Set	1
7.0	Spares insulating oil to be handed over to Powergrid after commissioning for O&M requirement.	KL	10
C.	3000A, 50kA, 765kV, 6 core Current Transformer (1-Ph) complete in all respect including terminal connectors (of each type)	No.	1

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	List of Mandatory Spares	Unit	Qty
D	765kV, 8800pf CVT (1-Ph) complete in all respects including terminal connector (of each type)	No.	1
E.	624kV Surge Arrester		
1.0	624kV Surge arrester complete with insulating base and terminal connectors (of each type)	No.	1
2.0	Surge counter/monitor	No.	5
F)	765 kV Isolator		
F1	3150A, 50kA, Isolator with one E/S		
1.0	One complete pole of Isolator including support insulator with 1 E/S with operating mechanism for main isolator and earth switch (excluding structure)	No.	1
2.0	Copper contact fingers for female & male contacts	set	2
3.0	Open/Close Contactor Assembly, Timer, Key Interlock push button switch & auxiliary switches	set	1
4.0	Limit switch	Nos.	2
5.0	Terminal pads & Connectors	no	3
6.0	Corona shielding ring	Nos.	3
F2	2000A, 50kA, Isolator with one E/S		
1.0	One complete pole of Isolator including support insulator with 1 E/S with operating mechanism for main isolator and earth switch (excluding structure)	No.	1
2.0	Copper contact fingers for female & male contacts	set	2
3.0	Open/Close Contactor Assembly, Timer, Key Interlock push button switch & auxiliary switches	set	1
4.0	Limit switch	Nos.	2
5.0	Terminal pads & Connectors	no	3
6.0	Corona shielding ring	Nos.	3
G	400kV SF6 Circuit Breaker		
1.0	One Complete Pole of 400kV CB without PIR including Grading Capacitor, Pole column interrupter, with driving mechanism and Marshaling Box but without support structure.	Pole	1
1(a)	One Complete Pole of 400kV CB with PIR including Grading Capacitor, Pole column interrupter, with driving mechanism and Marshaling Box but without support structure.	Pole	1

	List of Mandatory Spares	Unit	Qty
2.0	Grading capacitor (if applicable)	No	1
3.0	Rubber gasket, 'O' rings and seal (For Complete replacement for one phase)	Set	1
4.0	Trip coils with resistor	Nos.	3
5.0	Closing coils with resistor	Nos.	3
6.0	Terminal Pad	Nos.	2
7.0	Molecular filter (For Complete replacement for one phase)	Nos	2
8.0	Corona Rings	Nos	1
9.0	Relay Power contactors, switch fuse units, limit switches, push button, timers & MCB etc (One No. of each Type)	Set	1
10.0	Pressure switch of each type/Density monitor (One No. of each Type)	Set	1
11.0	Auxiliary switch assembly (For one Phase of CB)	Set	1
H	3000A, 63kA, 400kV, 6 core Current Transformer (1-Ph) complete in all respect including terminal connectors	No.	1
I	400kV, 4400pf CVT (1-Ph) complete in all respects including terminal connector	No.	1
J	336kV Surge Arrester		
1.0	336kV Surge arrester complete with insulating base and terminal connectors	No.	1
2.0	Surge counter/monitor	No.	5
K	400kV Isolator		
K.1	3150A, 63kA, Isolator with one E/S		
1.0	One complete pole of Isolator including support insulator with 1 E/S with operating mechanism for main isolator and earth switch (excluding structure)	No.	1
2.0	Copper contact fingers for female & male contacts	set	2
3.0	Open/Close Contactor Assembly, Timer, Key Interlock push button switch & auxiliary switches	set	1
4.0	Limit switch	Nos.	2
5.0	Terminal pads & Connectors	no	3

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	List of Mandatory Spares	Unit	Qty
6.0	Corona shielding ring	Nos.	3
K.2	2000A, 63kA, Isolator with one E/S		
1.0	One complete pole of Isolator including support insulator with 1 E/S with operating mechanism for main isolator and earth switch (excluding structure)	No.	1
2.0	Copper contact fingers for female & male contacts	set	2
3.0	Open/Close Contactor Assembly, Timer, Key Interlock push button switch & auxiliary switches	set	1
4.0	Limit switch	Nos.	2
5.0	Terminal pads & Connectors	no	3
6.0	Corona shielding ring	Nos.	3
Q	Bus Post Insulator		
1.0	765kV	Nos.	1
2	400kV	Nos.	1
3	145 kV	Nos.	1
R	Relay and Protection system		
1.0	Line Protection panel spares		
a	Main-I Numerical distance relay (complete unit)	Nos.	1
b	Main-II Numerical distance relay (complete unit)	Nos.	1
c	Numerical Line current differential relay (complete unit)	Nos.	1
2.0	Transformer protection panel spare		
a	Transformer differential protection	Nos.	1
b	Restricted earth fault protection relay with non-linear resistor	Nos.	1
3.0	Reactor Protection panel spare		
a	Reactor differential protection relay	Nos.	1
b	Reactor Back up impedance relay (if standalone)	Nos.	1
c	Restricted earth fault protection relay with non-linear resistor	Nos.	1
4	Common Spares		
a	Power supply module for Bus Bar protection.(If applicable)	Nos.	1
b	Bus Bar Bay unit module if Applicable	Nos.	1

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	List of Mandatory Spares	Unit	Qty
S	Sub-Station Automation/SCADA system		
1.	Bay control unit (IED) of each type	Nos.	1
2.	Ethernet switch of each type	Nos.	1
T	PLCC, DPC and EPAX Spares		
1.	Set of prints for carrier terminal	Set	2
2.	Set of prints for Analogue protection coupler (of each type)	Set	2
3.	Set of prints for EPAX	Set	1
4.	Set of print for Digital Protection coupler	Set	2
U	Fire protection System		
1.0	Deluge Valve	Set	1
V	220V Battery Charger		
1.	Set of Control Cards	Set	1
2.	Set of relays	Set	1
3.	Rectifier transformer	Set	1
4.	Thyristor/ Diode	Set	1
5.	Fuses of Thyristor with indicators	Set	6
W	48V Battery Charger		
1.	Set of Control Cards	Set	1
2.	Set of relays	Set	1
3.	Rectifier transformer	Set	1
4.	Thyristor/ Diode	Set	1
5.	Fuses of Thyristor with indicators	Set	6
X	DG SETS :		
1	Self starter assembly	Nos.	1
2.0	AVR (Auto Voltage Regulator)/ AVR card	Set	1
Y	Mandatory Spare for Telecommunication equipment		
1	Transmission Equipment		
	SDH Equipment (STM- 16 MADM, upto 3 MSP protected directions)		
(I)	Common cards, Cross-connect/control cards, Optical base cards, Power supply cards, power cabling, other hardware & accessories (one of each type of module/unit)	Set	1
(II)	Optical cards / SFP@ for :		
(b)	L16.1	No.	1
(c)	L16.2	No.	1

	List of Mandatory Spares	Unit	Qty
(d)	Optical Line Interface card (to support minimum 150 km) for STM-16**	No.	1
(e)	Optical Line Interface card (to support minimum 225 km) for STM-16**		
i	To support minimum 175 km	No.	1
ii	To support minimum 200 km	No.	1
iii	To support minimum 225 km	No.	1
(III)	Tributary Cards		
(a)	E1 Interface card (Minimum 16 interfaces per card)	No.	1
(b)	Ethernet interfaces 10/100 Mbps with Layer-2 switching (Minimum 4 interfaces per card.)	No.	1
2	Termination Equipment		
A1	Drop & Insert Multiplexer Base Equipment (Common cards, Power supply cards, power cabling, other hardware & accessories including sub-racks, etc. fully equipped excluding subscriber line interface cards) (one of each type of module/unit)	Set	1
A2	Subscriber Line Interface Cards		
a)	2 wire (sub/sub) voice channel cards (min 8 channels per card)	No.	1
b)	4 wire (E&M) voice channel cards (min 8 channels per card)	No.	1
c)	2 wire (Sub/Exchange) voice channel cards (min 8 channel per card)	No.	1
d)	Asynchronous Sub Channels data cards (V.24/V.28) , minimum 4 channels per card	No.	1
3.0	Pre Connectorized Optical Fiber Patch Cords (10 Mtrs) - Pack of six Patch cords	Set	3
4.0	4 port VOIP gateway for remote locations (RTU locations)	No.	1