

Name of the Company: POWER GRID Corporation of India Limited

Standard Lists of Capital/O&M Spares for Green Field 765/400/220/132/66/33 kV Substation i.e. new S/S

S no.	DESCRIPTION	Unit	Quantity	Amount (INR)765kV	Amount (INR)400kV	Amount (INR) 245kV	Amount (INR) 132kV
A	765/420/ 245/ 145 KV SF6 CIRCUIT BREAKER						
1	Complete Pole of circuit breaker including closing resistor, grading capacitor, pole column, interrupter ,operating mechanism, Marshling Box and terminal connector but without support structure	No.	1 pole (each make & type)	44,23,297	24,00,820	7,92,267	5,08,782
2	Grading Capacitor	No.	2 nos.	3,15,732	38,808	38,808	8,16,878
3	Rubber gaskets, 'O' rings and seals	Set	1 set	36,177	2,59,648	23,391	59,860
4	Trip coils with resistor	No.	1 set	4,455	9,777	10,869	52,626
5	Closing coils with resistor	No.	1 set	4,455	9,777	17,361	52,626
6	Terminal Pads and connectors	No.	1 set	15,693	13,359	20,859	83,436
7	Molecular filter	No.	2 nos.	10,088	16,526	11,615	34,520
8	Density / pressure monitoring systems (if applicable)	No.	1 no	20,035		93,178	53,738
9	Corona rings	No.	1 no	38,318	3,667	2,631	60445**
10	Relays, Power contactors, switch fuse units, limit switches, push buttons, timers & MCB etc.	Set	1 set	57,350	36,542	50,229	51,683
11	Pressure switches	Set	1 set	20,035	15,594	28,217	55,981
12	Pressure Gauge and coupling	Set	1 set		1,14,678	24,818	23,641
13	SF6 Gas	Set	10% of Total SF6 gas in installed equipment (Minimum-100kg)		69,042	69,042	69,042
14	Auxiliary switch assembly	Set	1 set	18,957	3,414	17,987	26,761
15	Operation Counter	No.	1 no		9,638		9,638
16	Fixed, moving and arcing contact assemblies including Insulating Nozzles etc for 1 Interrupter	Set	1 pole				
A1	Spring Operated Mechanism (If Applicable)						
1	Closing Dashpot	Set	1 set for complete CB		11,082		
2	Opening Dashpot	Set	1 set for complete CB				
3	Opening Catch gear	Set	1 set for complete CB				
4	Closing Catch gear	Set	1 set for complete CB				
5	Complete Spring Operating Mechanism	Set	1 set for complete CB		11,91,207		3,61,593
6	Spring Charging Motor		1 no				
C	765/420/ 245/ 145/ 72.5 KV HORIZONTAL CENTRE BREAK/						
1	One complete pole including support Insulator, motor operating mechanism (MOM) and terminal connector but excluding structure	No.	1 pole	9,52,321	4,55,859	4,77,512	3,37,505
2	Isolator Arms with finger contacts and current carrying assembly	No.	1 set				
3	Copper contact fingers for male & female contacts	Set	2 sets	34,640	45,448	1,02,734	49,934

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S no.	DESCRIPTION	Unit	Quantity	Amount (INR)765kV	Amount (INR)400kV	Amount (INR) 245kV	Amount (INR) 132kV
4	Open / Close contactor assembly, timers, key interlock push button switch & auxiliary switches	Set	1 set	21,074	34,526	53,657	
5	Limit switch	Set	2 sets	16,164	3,572	14,024	12,276
6	Motor housing bearing assembly	No.	1 no				
7	Terminal Pads and connectors	No.	2 sets	31,524	22,022	9,200	
8	Motor with gear assembly and bevel gear assembly	No.	1 set		16,378		23,712
9	Corona shield rings	No.	3 nos	60,624	14,065	11,037	8,506
10	Hinge pins	No.	3 nos				
11	Bearings	Set	1 set				
12	Interlocking coil with resistor	No.	5 Nos.				
13	Fuses of each rating	No.	5 Nos.				
E	765/420/ 245/ 132/ 72.5/ 33 KV CURRENT TRANSFORMER						
1	Complete CT (each rating & not make) with Terminal connector & stool structure	No.	400kV - 02 nos. Other Voltage Class - 1 no. upto 30 nos. population - 2 nos. for more than 30 nos. population	62,85,234	22,07,914	11,77,798	
G	765/420/245/132/ kV VOLTAGE TRANSFORMER						
1	Complete CVT (each rating & not make) with terminal connectors & stool structure	No.	400kV - 2 nos. upto 30 nos. population - 3 nos. for more than 30 nos. population Other Voltage Class - 2 nos.	30,10,098	11,30,388	7,16,828	
I	765/400/245/132 kV SURGE ARRESTOR						
1	Complete L.A. (each rating & not make) with insulating base and Terminal connector & stool structure	No.	- 2 nos. upto 30 nos. population - 3 nos. for more than 30 nos. population	28,58,556	8,85,240	3,17,193	
2	Surge counter/monitor	No.	5 Nos.	47,855	59,345	59,345	

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Standard Lists of Capital/O&M Spares for FSC & TCSC

S. NO.	DESCRIPTION	Each Make & Type	Amount
	FSC/TCSC Elements		
6.1	Capacitor Units (for FSC and TCSC)	10% of Total Population.	
6.2	Fiber optic cable with end termination (1 Piece of longest length)	1 No	
6.3	Spark Gap assembly comprising of Trigatron, Ignition coil, Trigger, Transformer, Transient suppression card, Voltage divider Capacitor of each rating, Connecting HV leads, Forced Trigger pulse generating card as applicable	1 Set	
6.4	Damping Resistor elements	10% of total population subject to minimum 1no. of each type	
6.5	Current measuring device complete in all respect including terminal connector, fitment, hardware and accessories as applicable	10% of total population subject to minimum 1no. of each type	₹ 3,38,92,998.28
6.6	Voltage measuring device complete in all respect including terminal connector, fitment, hardware and accessories as applicable	1 set	
6.7	Electrical to Optical signal converter of each type as applicable	1 set	
6.8	400KV Platform to ground signal transmission system cubicle- relay/ module of each type	1 set	
6.9	MOV-FSC	10% of the required MJ rating but minimum 2 nos. as hot spare per phase	
6.10.	MOV-TCSC	10% of the required MJ rating but minimum 2 nos. as hot spare per phase	
6.11	Thyristor Valve (as applicable)		
6.11.1	Thyristors of each type and rating	5% of Total Population minimum 10 Nos.	
6.11.2	Surge arrester/MOV of each type and rating	5% of total population	
6.11.3	Valve reactor of each type and rating	2 nos.	
6.11.4	Snubber capacitors of each type	5% of Total Population minimum 5Nos.	
6.11.5	Snubber resistors of each type	5% of Total Population minimum 5Nos.	
6.11.6	Grading capacitors/Resistor of each type	2 Nos.	
6.11.7	Thyristor electronics (PCBs) of each type	5% of Total Population minimum 10 Nos.	
6.11.8	Corona shield each type	1 Set	
6.11.9	Fiber optics with end termination for each function	1 Set	₹ 3,32,288.00
6.11.10	Insulators of each type	1 Set	
6.11.11	Fitment, hardware and accessories for 1 module	1 Set	
6.11.12	PEX tubes of each type along with couplings and washers	5% of total population	
6.11.13	Clamps and connectors of each type	2 Sets	
6.11.14	Gate cards/ TE/TVM	5% of total population	
6.11.15	Spare for Valve base electronics	1 Set	
6.11.16	Assembly accessories for surge arrestors of each type and rating along with fitment hardware and accessories	2 Sets	
6.11.17	Arrestor counter of each type	1 Set	
6.12	Valve cooling equipment spares		
6.12.1	Set of Valve cooling control devices and modules	1 Set	
6.12.2	Set of valve hall ventilation control devices and modules	1 Set	
6.12.3	Fitment hardware and accessories	1 Set	
6.12.4	Electrically operated Valve of each type	1 No.	
6.12.5	Filter element assembly of each type	1 Set	
6.12.6	Pump shaft seal of each type	1 Set	
6.12.7	Rings & Gaskets of each type	1 Set	
6.12.8	Contactors, relays and timers of each type	1 Set	

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Standard Lists of Capital/O&M Spares for FSC & TCSC

S. NO.	DESCRIPTION	Each Make & Type	Amount
6.12.9	PLC with configuration software & manual	1 Set	₹ 16,95,261.99
6.12.10	Flow meter & sensor - each type	1 Set	
6.12.11	Pressure gauge of each type	1 Set	
6.12.12	Temperature sensors of each type		
6.12.13	Conductivity sensors	1 Set	
6.12.14	MCCB & MCB of Each type and rating	10% of total population subject to min. 2 nos. of each type & rating	
6.12.15	Indicating instruments - each type	1 Set	
6.12.16	Switches - each type	1 Set	
6.12.17	UPS of each rating	1 Set	
6.12.18	Valve of each type and size	1 Set	
6.12.19	Couplings of each type and size	2 Sets	
6.12.20	Clamps and fixing material with hardware and accessories	2 Sets	
6.12.21	Heat exchanger fan with motor	1 Set	
6.12.22	Complete cooling pump with Motor	1 Set	
6.12.23	Rubber compensators	1 Set	
6.13	Support insulators of each type and rating	10% of total population	
6.14	Fiber Optic signal column	2 Set of longest length	
6.15	Erection Hardware		₹ 13,92,626.80
6.15.1	Bus Bar material with connectors of each type	2 Sets	
6.15.2	Connecting leads with lugs for Capacitor	20 set	
6.16	Breaker Relay Panel		₹ 6,88,776.00
6.16.1	Breaker failure relay of each type (as applicable)	1 No.	
6.16.2	Trip/ Close circuit supervision relay of each type (as applicable)	1 No.	
6.16.3	Self-reset trip relay of each type (as applicable)	1 No.	
6.16.4	Hand reset trip relay of each type (as applicable)	1 No.	
6.16.5	Timer relay of each type (as applicable)	1 No.	
6.16.6	DC supervision relays of each type (as applicable)	1 No.	
6.16.7	Flag relays of each type (as applicable)	1 No.	
6.16.8	Auxiliary relays used in Controller	10% of total population	
6.17	Control Panel Equipment		₹ 75,80,737.96
6.17.1	Digital display unit (as applicable) of each type	1 Set	
6.17.2	Red, Green, White indicating lamp with complete assembly (as applicable)	5 Sets of each colour	
6.17.3	Bulbs (for indication lamps) (as applicable)	50 Nos.	
6.17.4	Annunciation windows with necessary annunciation relay (as applicable)	6 Nos.	
6.17.5	Red, Yellow, Black, Green Push button (as applicable)	1 Set or each colour	
6.17.6	Counters for spark gap operation (as applicable)	2 Sets	
6.17.7	Control switch of each type	1 Set	
6.17.8	Instrument & meter with transducer of each type	1 No.	
6.18	Relay/ interface Panel		
6.18.1	Relay/ Module/ Electronic card of each type for each type of function	20% of total population with min 2 sets	
6.18.2	Filters/ transient suppressor of each type	2 sets	
6.18.3	Disturbance Recorder for FSC comprising of Evaluation & Acquisition unit with software	2 sets	
6.18.4	Control card of each type including Programmable CPU	20% of total population with min 2 sets	
6.18.6	If PC based monitoring of Control & Protection system is provided		
6.18.6.1	Data acquisition card each type	1 Set	

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Standard Lists of Capital/O&M Spares for FSC & TCSC

S. NO.	DESCRIPTION	Each Make & Type	Amount
6.18.6.2	Hardware for PC with CPU, Motherboard, Memory (RAM & Hard disk), CD ROM drive, monitor, key board, mouse	1 Set	
6.18.6.3	Data switch	1 Set	
6.18.6.4	If Rack mounted industrial PC is used, Power supply, Motherboard with Memory (RAM & Hard disk), monitor, CD ROM drive, key board, mouse, fan, PCMCIA card	1 Set	
6.18.6.5	Transducer of each type	1 Set	
6.19	Testing & Measuring Equipment		
6.19.1	Control/Protection logic programming device with necessary software	1 Set	₹ 75,80,737.96
6.19.2	Special tool for making joints and termination of optical fiber with relevant couplers/ termination hardware –each type	1 Set	₹ 2,59,258.63
6.19.3	Optical loss measuring kit with relevant accessories and visual Fiber Optic cable inspection	1 Set	
6.19.4	Telescopic earthing device with terminal clamps and earthing wire	4 Set	₹ 3,85,639.69
6.19.5	Capacitance meter with all hardware & accessories	1 Set	₹ 4,11,809.97

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Standard Lists of Transmission Line

S.No	Name of capital spare	Qty (Nos) (for each Region)	Cost (Rs)
Tras. lines 765kv			
1.	Suspension towers with Delta configuration with Stub and cleats, Nut and bolts for each design towers	8	14672358
2	Tension Towers with stub and Cleats nut and bolts etc for each design tower(B,C,D in Delta configuration)	1	9835242
Tras. lines 400 kV			
1.	Suspension Towers with Stub and cleats, nut and bolts for all design towers	8	12810258
2	Tension Towers with stub and Cleats nut and bolts etc for all design towers (B,C,D)	1	9401560
Tras. lines 220kV			
1.	Suspension Towers with Stub and cleats, nut and bolts for all design towers	3	1167998
2	Tension Towers with stub and Cleats nut and bolts etc for all type (B & DB, C& DC, D & DD)	1	1876051
3.	Extensions for all types of suspension towers installed in line .	1	
4	Extensions for all types of tension towers installed in line	1	
5.	Stub setting templates for each type of suspension tower including extension	3	
6	Stub setting templates for each type of tension tower including extension	1	
Tras. lines 132kV			
1.	Suspension Towers with Stub and cleats, nut and bolts for all design towers	3	471815
2	Tension Towers with stub and Cleats nut and bolts etc for all type (B & DB, C& DC, D & DD)	1	845254
Tras. lines 500kV HVDC			
1.	Suspension Towers with Stub and cleats, nut and bolts for all design towers	8	10529458
2	Tension Towers with stub and Cleats nut and bolts etc for all type (B & DB, C& DC, D & DD)	1	6014465
Tras. lines 800kV HVDC			
1.	Suspension Towers with Stub and cleats, nut and bolts for all design towers	8	23206897
2	Tension Towers with stub and Cleats nut and bolts etc for all type (B & DB, C& DC, D & DD)	1	15719795
Transmission Line Material/ Tower Accessories/ Templates in Regional Stores:			
S. No	Name of capital spare	Qty (Km) (For each Region)	Cost (Rs)
1	7 x 3.66 mm Earthwire	4 Km in each Region	243164
2	7 x 3.15 GS Earthwire	4 in each Region	204612
3	7 x 4.50 GS Earthwire	4 in each Region	386664
4	ACSR Moose Conductor	24 in each Region	8978592
5	ACSR Zebra Conductor (for regions having both 765kV and 220kV Lines)	72 in each Region	21746808
6	ACSR Zebra Conductor (in regions having only 220kV Lines)	12 in each Region	4489296
7	ACSR Panther conductor (in regions having such lines)		165740
8	ACSR Dog Conductor (in Regions having such lines)	6 in each Region	561000
9	ACSR Bersimis Conductor (in regions having such lines)	24 in each Region	13903968
10	ACSR Snowbird conductor (in regions having such lines)	36 in each Region	15033636
11	ACSR Lapwing conductor (in regions having such lines)	24 in each Region	15664032
12	Other special type of conductor like AAAC INVAR, HTLS etc (in regions having such lines)	10% of line length	
Disc Insulators			
13	70kN for 132kV/ 220kV Lines	1000 Nos in each Region	718000
14	90kN for 132kV Lines	2000 Nos in each Region	1468000

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Standard Lists of Transmission Line

S.No	Name of capital spare	Qty (Nos) (for each Region)	Cost (Rs)
15	120kN for 220kV/ 400kV lines	3500 Nos in each Region	3594500
16	160kN for 400kV lines	2000 Nos in each Region	2438000
17	210kN for 400kV lines	2000 Nos in each Region	2972000
	Polymer Insulators for Medium/ heavy pollution zone		
18	70kN for 132kV/ 220kV Lines	150 Nos in each Region	407700
19	90kN for 132kV Lines	150 Nos in each Region	423450
20	120kN for 220kV/ 400kV lines	350 Nos in each Region	1923950
21	160kN for 400kV lines	350 Nos in each Region	1980300
22	210kN for 400kV lines	150 Nos in each Region	960750
23	120kN for 765kV lines	350 Nos in each Region	2408700
24	160kN for 765kV lines	350 Nos in each Region	2628850
25	210kN for 765kV lines	350 Nos in each Region	2644250
26	160kN for HVDC lines	150 Nos in each Region	
27	210kN for 500kV HVDC lines	150 Nos in each Region	
28	420kN for 800kV HVDC lines	150 Nos in each Region	
	Hardware Fittings		
29	Hardware fittings of different designs used in the region for suspension tower	100 Sets of different used designs in a region	1764500
30	Hardware fittings of different designs used in the region for tension tower	30 Sets of different used designs in a region	1171440
31	Hardware fittings of different designs used in the region for pilot strings	7 Sets of different used designs in a region	237202
	Conductor Accessories		
32	Tubular type Repair sleeves for each type of conductor	70 Sets of each used conductor type	33110
33	MS compression joint for each type of conductor	70 Sets of each used conductor type	97020
34	Bundle spacers with retaining rods for conductor	600 Sets of each used conductor type	751200
35	Spacer for jumper for each conductor configuration	70 Nos of each used conductor type	46410

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Standard Lists of Transmission Line

S.No	Name of capital spare	Qty (Nos) (for each Region)	Cost (Rs)
36	Vibration Dampers for conductor	400 Nos of each used conductor type	504800
37	Spacer dampers for each used conductor configuration	300 Nos of each used conductor type	897300
	Earthwire Accessories	Nos.	
38	Vibration damper for used Earth wires	40 Nos of each used earthwire type	33120
39	Suspension clamp for used Earthwire	20 Nos of each used earthwire type	24400
40	Tension clamps for earth wire	15 Nos of each used earthwire type	17670
41	Flexible copper / Aluminium bond for Earthwire	30 Nos of each used earthwire type	8400
42	MS compression joint for each type of earthwire	15 sets of each used earthwire type	6525
	Mandatory Spares for HTLS conductor Transmission lines.		
43	HTLS Conductor of each type	10% of line length	
44	Suspension clamp for Conductor	40 Nos of each type	337240
45	Tension clamps for conductor	40 Nos of each type	252920
46	Pilot suspension clamp	8 Nos of each type	234880
47	Spacer / Spacer Damper	300 Nos of each type	885600
48	Repair sleeves	20 Nos of each type	31200
49	Mid Span joint	20 Nos of each type	222620
50	Vibration Dampers (if used)	100 Nos of each type	
51	Rigis spacers for jumpers	25 Nos of each type	29300

Note: *Separate break-up should be furnished for elements are in operation and spare elements.

- The transmission licensee shall provide the reigonwise spare ICTs/Reactors alongwith policy for deploying spare ICTs/reactors and its utilization within a reigon.

Name of the Company: POWER GRID Corporation of India Limited

Standard Lists of Capital/O&M Spares : Transformers & Reactors

SL NO.	ITEM DESCRIPTION	Unit	Quantity	Amount (INR)
AUTO TRANSFORMERS				
1	Oil cooler pump with motor	No	1	37218
2	Buchholz Relay (Main Tank) complete with float and contacts	No	1	16646
3	Local Winding Temperature Indicator	No	1	25127
4	Remote WTI with sensing device and contact (each)	No	1	20520
5	Oil temperature indicator	No	1	20881
6	Pressure relief Device	No	1	19676
7	Magnetic oil level gauge	No	1	15087
8	Cooler fan with Motor	No	1	19695
9	Set of valves(Complete set for replacement of one auto transformer)	No	1	234515
10	Set of Starters, contactors, switches & relays for Electrical control panels	No	1	127456
11	Remote Tap Position Indicator	No	1	404474
12	Oil Flow Indicator with flow Switch	No	1	293010
13	Breather Assembly(One of each type) for Conservator and OLTC	No	1	63149
14	Oil Surge Relay for OLTC	No	1	166121
SHUNT REACTORS				
1	Local Winding Temperature Indicator	No	1	20440
2	Remote WTI with sensing device and contact (each)	No	1	20440
3	Oil temperature indicator	No	1	17256
4	Magnetic oil level gauge	No	1	15087
5	Pressure relief Device	No	1	19676
6	Buchholz Relay (Main Tank) complete with float and contacts	No	1	16178
7	Neutral LA for each rating	No	1	311924
8	Surge Monitor for Neutral LA	No	1	12810
9	Breather Assembly	No	2	63938
10	Set of valves	No	1	234515
BUSHINGS				
	Bushing of each rating with metal parts & gaskets and lifting tools			
1	765 kV	No	1	3498406
2	400 kV 2500A	No	1	1059336
3	400 kV 1250A	No	2	3943738
4	245kV	No	1	1439837
5	145kV	No	1	682280
6	52 kV	No	1	368421
7	36 kV	No	1	226508
8	24 kV	No	1	226508
INSULATING OIL				
	Spare insulating oil	KL	10	1291700
NEUTRAL GROUNDING REACTOR				
1	NGR for 765kV along with Terminal Clamps & Connectors	No	1	2484221
2	NGR for 400kV along with Terminal Clamps & Connectors	No	1	2486400
3	Oil temperature indicator	No	1	20881

			Annexure - XII	
Name of the Company: POWER GRID Corporation of India Limited				
Standard Lists of Capital/O&M Spares : Transformers & Reactors				
SL NO.	ITEM DESCRIPTION	Unit	Quantity	Amount (INR)
AUTO TRANSFORMERS				
4	Oil Level Gauge	No	1	15087
5	Pressure relief Device	No	1	19676
6	Buchholz Relay complete with float and contacts	No	1	16646

Name of the Company: POWER GRID CORPORATION OF INDIA LIMITED
Standard Lists of Capital/O&M Spares for STATCOM

S. No.	DESCRIPTION	Each Make & Type	Amount
10.1	STATCOM Valve		
10.1.1	Power module of each rating and type	10% of each type subject to minimum 10 No.	₹ 6,73,27,104
10.1.2	Optical fiber signal cable to the power module	1 Sets of each type	
10.1.3	Cooling tubes /flex pipes with coupling	1 Sets of each type	
10.1.4	Clamps and connectors	2 Sets of each type	
10.1.5	Grading electrode for Valve Cooling water	5% of Population or 2 sets of each type whichever is higher	
10.1.6	Valve Hall CT along with electronics	1 Set	
10.1.7	All sensor such as temperature/Pressure	1 Set of each type	
10.1.8	Gaskets	1 lot	
10.1.9	Epoxy bolts/nuts of each type	10% of each type or maximum 02 nos. of each type.	
10.1.10	Arrestor across Valve module	1 No.	
10.1.11	Arrestor across Valve	1 No.	
10.1.12	Grounding switch contact kit	2 set	
10.1.13	Support porcelain of each type	4 nos.	
10.1.14	Wall bushing of each type	1 no	
10.1.15	Bypass Resistor, if applicable	1 no	
10.1.16	Charging Resistor	1 No	
10.1.17	Bypass Breaker/Switch for Charging Resistor	1 No	
10.1.18	Set of valve hall ventilation control devices and modules	01 Set	
10.1.19	Series Reactor complete with fitments, hardware & accessories & terminal Connector	1 Set	
10.1.20	Insulators set required for single reactor	1Set	
10.2	Valve cooling Equipment		
10.2.1	a. Fine Water Pump complete with Motor b. Pump with motor except covered under serial no. a above	1 Set	₹ 22,36,702
10.2.2	Pump shaft seal of each type of pump	2 Set	
10.2.3	Resin	For complete replacement	
10.2.4	Valves of each size & type	1 No	
10.2.5	Control Modules/PLC loaded with program along with configuration software for each type	1 Set	
10.2.6	Fine filter with fitment, hardware and	1 Set	
10.2.7	Coarse filter with fitment, hardware and	1 Set	
10.2.8	Fan - unit of Water to air heat	2 No.	
10.2.9	Gaskets and "O" Ring of each type	1 Set	
10.2.10	Contactors/ starters, relays, timers, solenoids,	10% of total	
10.2.11	Pressure gauge of each type	01 Set	
10.2.12	Flow meter/ sensor of each type	01 Set	
10.2.13	Temperature sensors of each type	01 Set	
10.2.14	Conductivity sensors	01 Set	
10.2.15	Indicating instruments of each type	01 Set	
10.2.16	Couplings of various sizes & types	01 Set	
10.2.17	Clamps and fixing material	01 Set	
10.2.18	Pressure transducer of each type	1 No	
10.2.19	Level Switches & Level transducer of each type	1 No	
10.2.20	Spares for flexible Shaft of Cooling Tower i. e.	1 No	
10.2.21	Flex Pipes for complete replacement	included in Valve	
10.3	Coupling transformer		
10.3.1	Insulating Oil	10 % of Qty of oil in	₹ 57,08,604
10.3.2	420kV & MV bushing with metal parts and	1 No	
10.3.3	Terminal clamps, connectors & hardware of each	1Set	
10.3.4	Cooler fan with motor	2 Set	
10.3.5	Pressure relief device/safety valve	1 No	
10.3.6	Buchholz relay	1 No	
10.3.7	Pressure/Oil Surge Relay	1 No	
10.3.8	Breather assembly for main tank	1 complete set for one	
10.3.9	Winding temp. indicator with contacts	1 no.	
10.3.10	Remote winding temperature indicator with	1 No	
10.3.11	Oil temperature indicator with contacts and	1 no.	
10.3.12	Magnetic oil level gauge	1 no.	
10.3.13	Oil Flow Indicator with flow Switch	1 Set	

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S. No.	DESCRIPTION	Each Make & Type	Amount
10.3.14	Set of valves	1 Set	
10.3.15	Fuses & indicating bulbs (for complete replacement for one transformer)	1 Set	
10.3.16	Set of magnetic contactors, switches, fuses relays for electric control panel	10% of population or Min 01 no	
10.3.17	Set of gaskets	Complete replacement for 1 transformer	
10.3.18	Air cell	1 No.	
10.3.19	Set of pressure gauges	1 Set	
10.3.20	Set of pressure switches	1 Set	
10.4	MSR Reactor		
10.4.1	Reactor complete with fitments, hardware accessories & Connectors	1 No	₹ 11,02,27,978
10.4.2	Insulators set required for single reactor	1Set	
10.5	MSC Bank		
10.5.1	Capacitor cans	5 % of each type and rating subject to minimum 10 units	₹ 36,04,991
10.5.2	Series Reactor (Air Core)	1 nos. of each type and rating	
10.5.3	Support Insulator	5 nos. of each type and rating	
10.6	Filter equipment (if Applicable)		
10.6.1	Capacitor unit of each type with fitment, Hardware and accessories, terminal connection leads & connectors	5 % of Each type and rating subject to minimum 10 units	₹ 11,66,908
10.6.2	Reactors	1 no. of each type and rating	
10.6.3	Resistor Element (if applicable)	10 elements of each type and rating	
10.6.4	Support Insulator	5 nos. of each type and rating	
10.6.5	Arrestor	1 no. of each type and rating	
10.7	Control & Protection System		
10.7.1	STATCOM Protection system relay	1 no. Protection Relay of each type	
10.7.2	Set of Cards/Modules/Relay/PC of each type and function for Control, Protection, Communication, Event Logger, PLC, DFR/TFR including power supply module	10 % of population or minimum 01 no. of card/module of each type	
10.7.3	Cards/module for Transient Fault Recorder/Disturbance Recorder including software (Wherever applicable)	1 Set	
10.7.4	Spare-Modules of C&P, communication, Annunciation, SCADA, DFR, power supply module	One Set of each type and function.	₹ 94,88,140
10.7.5	Interconnecting cable with connector of each type & function	1 No	
10.7.6	Optical fiber Cables used in inter panel wiring in Control room in such as ribbon cables-each type & size with termination	2 Sets	
10.7.7	LAN Switch each type	2 No	
10.7.8	GPS Time display unit receiver card & antenna	1 Set	
10.7.9	Thermostat	2 No.	
10.7.10	Panel space heater	2 No.	
10.8	MV AC System		
10.8.1	CURRENT TRANSFORMER		
10.8.1.1	CT's one phase of each type and rating	1 no. of each type and rating	₹ 20,09,882
10.8.1.2	Bushing CT	1 Set of each type & rating	
10.8.2	VOLTAGE TRANSFORMER		
10.8.2.1	Voltage transformers (single phase)	1 no. of each type and rating	₹ 2,70,376
10.8.3	SURGE ARRESTOR		
10.8.3.1	Surge arrestor	2 Nos.	₹ 43,553
10.8.4	SURGE CAPACITORS		
10.8.4.1	Surge Capacitor	2 nos. of each type	₹ 1,43,040
10.8.5	Busbar hardware		
10.8.5.1	MV Bus support insulators	05 no. of each type and rating	₹ 1,05,904
10.8.6	MV Isolator		
10.8.6.1	Set of contact fingers for isolators for 3ph	1 no. of each type and rating	
10.8.6.2	Complete 3 phase isolator with operating mechanism	1 no. of each type and rating	
10.8.6.3	Set of relays, power contactors & switch fuses for electrical Control ckt.	10 % of Population	₹ 4,49,060
10.8.6.4	Rotary bearing for isolator	Complete replacement for two isolators (3 ph)	
10.8.7	MV Earth Switch		
10.8.7	MV Earth Switch	1 no. of each type and rating	₹ 1,20,103
10.8.8	MV Circuit Breaker		

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S. No.	DESCRIPTION	Each Make & Type	Amount
10.8.8.2	Rubber gaskets, 0 rings and seals (complete replacement for one breaker)	1 No.	₹ 12,035
10.8.8.3	Trip coil with resistor	2 Sets	₹ 5,960
10.8.8.4	Closing coils with resistor	1Set	₹ 3,094
10.8.8.5	Molecular filter for SF6 Circuit for CB (If applicable)	1 no	₹ 4,527
10.8.8.6	Terminal pads and connectors	1 no	₹ 17,192
10.8.8.7	Relays, power contactors, switch-fuse units, limit switches, push buttons, timers and MCBs etc as applicable	1 Sets	₹ 15,014
10.8.8.8	Pressure switches, if applicable	1 Sets	₹ 21,089
10.8.8.9	Auxiliary Switch Assembly	1 Sets	₹ 9,055
10.8.8.10	Controlled switching device	1 no	₹ 6,00,809
10.8.9	Clamp & Connectors	10% of total population with min 2 set of each type	
10.9	Zig-Zag Transformer with NGR	1 No. for each region if more than 2 installation otherwise to be shared with nearby region	₹ 40,88,875
10.1	400kV IVT-1 Phase (if Applicable)	1 Set	₹ 12,76,845
10.11	AVR (Automatic Voltage Regulator)		₹ 15,014
10.11.1	Set of Cards/Module for Voltage Stabilizer.	1 Set	
10.12	UPS each type		
10.12.1	Thyristors/IGBT	1 No. of each type	
10.12.2	Bridge	1 No.	
10.12.3	Set of Control Cards	1 No. of each type	
10.12.4	DC/DC converter	1 No.	
10.12.5	Contactors Assembly	1 No. of each type	
10.12.6	Servo Amplifier with brush set	1 No.	₹ 1,59,886
10.12.7	Cooling Fan	1 No. of each type	
10.12.8	MCBs/MCCBs	1 No. of each type	
10.12.9	Set of fuses & Switches	1 No. of each type	
10.12.10	Phase reversal Kit (if applicable)	1 No.	
10.12.11	Battery for UPS/UMD (with 1 No unit cell charger)	10% of total population minimum 2 Nos.	
10.13	Fire Protection System		
10.13.1	Quartzoid bulb detectors	5 % of population	₹ 9,857
10.13.2	Projectors (Merxles)	5 % of population	₹ 41,147
10.13.3	Smoke detectors (if applicable)	5 % of population	₹ 27,851
10.13.4	Heat detectors	5 % of population	₹ 4,814
10.13.5	Deluge valve	1 set	₹ 1,08,082
10.13.7	Electrical control panel - Annunciation printed circuits Boards (For solid state annunciation) in the control panel	1 set	₹ 37,250
10.13.9	Pressure gauge	1 No.	₹ 3,668
10.14	220V/ Batteries		
10.14.1	Spare battery cell (of each type)	5 Nos	₹ 15,014
10.14.2	Terminal connectors with Bolts & Nuts	10 Nos. (each type)	₹ 3,668
10.15	220V Battery Chargers		
10.15.1	Set of Control Cards	1 set	₹ 22,579
10.15.2	Set of relays	1 set	₹ 22,579
10.15.3	Rectifier transformer	1 No.	₹ 22,579
10.15.4	Control transformer	1 No.	₹ 22,579
10.15.5	Series inductor	1 No.	₹ 22,579
10.15.6	Set of contactors	1 set	₹ 22,579
10.15.7	Micro switches	1 set	₹ 22,579
10.15.8	Filter Capacitors	1 set	₹ 22,579
10.15.9	Thyristor/ Diode	1 set	₹ 22,579
10.15.10	Set of switches	1 set	₹ 22,579
10.15.11	Set of wound resistors	1 set	₹ 22,579
10.15.12	Potentiometers	1 No.	₹ 22,579
10.15.13	Fuses of Thyristor with indicators	6 sets	₹ 31,518
10.16	DG SETS:		
10.16.1	Set of filters (Lube oil/ fuel/ Air ckt)	1 set	₹ 35,072
10.16.2	Solenoid coil assembly	1 No.	₹ 29,571
10.16.3	Self-starter assembly	1 No.	₹ 1,08,540
10.16.4	Lub. oil pressure safety control	1 No.	₹ 22,579
10.16.5	High water temperature safety control	1 No.	₹ 25,215

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S. No.	DESCRIPTION	Each Make & Type	Amount
10.16.6	AVR (Auto Voltage Regulator)/ AVR card	1 set	₹ 47,565
10.17	LT Switchgear		
10.17.1	Air circuit breaker	1 no. of each type and rating	₹ 2,25,333
10.17.2	Tripping coil for above a)	1 no. of each type and rating	₹ 15,014
10.17.3	Closing coil for above a)	1 no. of each type and rating	₹ 15,014
10.17.4	Current transformer of each rating and class	1 no.	₹ 15,014
10.17.5	Relay & contactors of each type and rating	2 nos.	₹ 15,015
10.17.6	Circuit breaker control switches	2 nos.	₹ 15,015
10.17.7	Potential transformer of each type and rating	1 no.	₹ 22,579
10.17.8	LT switches of each type & rating	1 no.	₹ 15,014
10.17.9	MCB's of each type & rating	1 no.	₹ 15,014
10.17.10	Switch fuse units of each type and rating	1 no.	₹ 15,014
10.17.11	Fuses	100%	₹ 15,014
10.17.12	Lamps	100%	₹ 2,636
10.18	AIR CONDITIONING & VENTILATION SYSTEM		
10.18.1	AC Unit of each type and rating	1 no.	₹ 3,13,127
10.18.2	Ventilation system motor	1 no. of each type and rating	₹ 7,23,906
10.19	Testing kit and Measuring device		
10.19.1	Control/Protection logic programming device with necessary software	1 Set	
10.19.2	Special tool for making joints and termination of optical fiber with relevant couplers/ termination hardware –each type	1 Set	₹ 2,59,259
10.19.3	Optical loss measuring kit with relevant accessories and visual Fiber Optic cable inspection	1 Set	
10.19.4	Telescopic earthing device with terminal clamps and earthing wire	1 Set	₹ 3,85,640
10.19.5	Capacitance meter with all hardware & accessories	1 Set	₹ 4,11,810
10.19.6	Power Module test unit including power and control unit test handle, Oscilloscope with fitments and accessories	1 Set	₹ 15,32,512
10.19.7	Set of tools to change Power Modules with fitments and accessories	1 Set	₹ 19,73,434
10.19.8	Equipment & set of tools for replacement of Power Modules modules	1 Set	
10.19.9	Power Modules/Capacitor lifting device	1 Set	
10.19.10	Maintenance tool kit for optical fibers, Controllers, optical test module for Optical CT/PTs	1 Set	₹ 2,59,259
10.19.11	DM water conductivity measurement kit	1 Set	
10.19.12	Mobile work platform with all fitments, hardware and accessories	1 Set	