

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

Breakup of Mandatory Spares			
S. No.	Item Description	Unit	Qty.
<b>A.</b>	<b>Spare for 400/220/132kV GIS</b>		
<b>1</b>	<b>General</b>		
1.1	SF6 Gas Pressure Relief Devices, 3 Nos. of each type	Set	2
1.2	SF6 Pressure gauge with coupling device cum switch or density monitors and pressure switch as applicable (1 no. of each type)	Set	1
1.3	Coupling device for pressure gauge cum switch for connecting Gas handling plant	Set	2
1.4	Rubber Gaskets, "O" Rings and Seals for SF6 gas of each type	Set	1
1.5	Molecular filter for SF6 gas with filter bags (20% of total weight)	Set	
1.6	All types of Control Valves for SF6 gas of each type	Set	2
1.7	SF6 gas (20 % of total gas)	LS	1
1.8	All types of coupling for SF6 gas (1 no. of each type)	Set	1
1.9	Pipe length (Copper or Steel as applicable) for SF6 Circuit of each type	Set	1
1.1	Density Monitors for SF6 gas	No.	1
1.11	Enclosures, Insulators & main circuit to replace on each phase, any compartment of Busbar bay	Set	1
<b>1.12</b>	<b>Covers with all accessories necessary to close a compartment in case of dismantling of any part of the Enclosure to ensure the sealing of this compartment</b>		
1.12.1	For 3 phase enclosure if applicable	Nos.	2
1.12.2	For 1 phase enclosure if applicable	Nos.	3
1.13	Locking device to keep the Dis-connectors (Isolators) and Earthing switches in close or open position in case of removal of the driving Mechanism	Set	1
1.14	Bus support Insulator of each type for single phase/ 3 phase enclosure (5% of population)	No.	1
1.15	SF6 to air bushing (400/220/132kV) of each type & rating	Set	1
1.16	Spares for Local control cabinet including MCB, fuses, timers, Aux Relay of each type & rating terminal of each type	Set	1
1.17	Bushing for Dielectric test on Cable	No.	1
1.18	T&P for bushing erection including ladder/ platform for Bushing erection and subsequently during O&M for Transformer	No.	1
1.19	Cable Termination Enclosure	Set	1
<b>2</b>	<b>Circuit Breakers</b>		
<b>2.1</b>	<b>400 kV Circuit Breaker</b>		
a)	Complete Circuit Breaker pole of each type & rating complete with interrupter, main circuit, enclosure and Marshalling Box with operating mechanism	Set	3
b)	Fixed, moving and arcing contacts including insulating nozzles 3 nos. of each	Set	1
c)	Rubber gaskets, 'O' rings and seals for SF6 gas of each type	Set	1
d)	Trip coil assembly with resistor as applicable, 3 nos. of each	Set	2
e)	Closing coil assembly with resistor as applicable, 3 nos. of each	Set	2
f)	Molecular filter for SF6 gas with filter bags (10% of total quantity used)	LS	1
g)	SF6 Pressure gauge cum switch or Density monitors and pressure switch as applicable, 3 nos each type	Set	1
h)	Coupling device for pressure gauge cum switch for connecting Gas handling plant, 3 nos of each type	Set	1
i)	Relays, Power contactors, push buttons, timers & MCBs etc of each type & rating	Set	1
j)	Closing assembly/ valve, 3 nos. of each type	Set	2
k)	Trip assembly/ valve, 3 nos. of each type	Set	2
l)	Aux. switch assembly, 3 nos. of each type	Set	1
m)	Operation Counter, 3 nos. of each type	Set	1
n)	Rupture disc, 3 nos. of each type	Set	1
o)	Windoscope / Observing window, 3 nos. of each	Set	1
p)	<b>Spring operating closing mechanism one no of each type, if applicable</b>	Set	1
q)	<b>Hydraulic operating mechanism, if applicable</b>		
i)	Hydraulic operating mechanism with drive motor , 3 nos of each type if applicable	Set	1
ii)	Ferrules, joints and couplings, 3 nos. of each type	Set	1

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

iii)	Hydraulic filter, 3 nos. of each ty	Set	1
iv)	Hose pipe, 3 nos. of each ty	Set	1
v)	N2 Accumulator, 3 nos. of each ty	Set	1
vi)	Pressure transducer, 3 nos. of each ty	Set	1
vii)	Valves 3 nos. of each ty	Set	1
viii)	Pipe length (copper & steel) 3 nos. of each size & t	Set	1
ix)	Pressure switches 3 nos. of each ty	Set	1
x)	Pressure gauge with coupling device, 3 nos. of each t	Set	1
xi)	Hydraulic oil (20% of total qty. use	Set	1
xii)	Pressure Relief Device, 3 nos. of each ty	Set	2
<b>2.2 220 kV Circuit Breaker</b>			
a)	Complete Circuit Breaker pole of each type & rating complete with interrupter, main circuit, enclosure and Marshalling Box with operating mechani	Set	3
b)	Fixed, moving and arcing contacts including insulating nozzles 3 nos. of each	Set	1
c)	Rubber gaskets, 'O' rings and seals for SF6 gas of each t	Set	1
d)	Trip coil assembly with resistor as applicable, 3 nos. of each	Set	2
e)	Closing coil assembly with resistor as applicable, 3 nos. of each	Set	2
f)	Molecular filter for SF6 gas with filter bags(10% of total quantity use	LS	1
g)	SF6 Pressure gauge cum switch or Density monitors and pressure switch as applicable, 3 nos each typ	Set	1
h)	Coupling device for pressure gauge cum switch for connecting Gas handling plant, 3 nos of each typ	Set	1
i)	Relays, Power contactors, push buttons, timers & MCBs etc of each type & r	Set	1
j)	Closing assembly/ valve, 3 nos. of each t	Set	2
k)	Trip assembly/ valve, 3 nos. of each t	Set	2
l)	Aux. switch assembly, 3 nos. of each t	Set	1
m)	Operation Counter, 3 nos. of each ty	Set	1
n)	Rupture disc, 3 nos. of each ty	Set	1
o)	Windoscope / Observing window, 3 nos. of each	Set	1
p)	<b>Spring operating closing mechanism one no of each type, if applicable</b>	Set	1
q)	<b>Hydraulic operating mechanism, if applicable</b>		
i)	Hydraulic operating mechanism with drive motor , 3 nos of each type if appli	Set	1
ii)	Ferrules, joints and couplings, 3 nos. of each t	Set	1
iii)	Hydraulic filter, 3 nos. of each ty	Set	1
iv)	Hose pipe, 3 nos. of each ty	Set	1
v)	N2 Accumulator, 3 nos. of each ty	Set	1
vi)	Pressure transducer, 3 nos. of each ty	Set	1
vii)	Valves 3 nos. of each ty	Set	1
viii)	Pipe length (copper & steel) 3 nos. of each size & t	Set	1
ix)	Pressure switches 3 nos. of each ty	Set	1
x)	Pressure gauge with coupling device, 3 nos. of each t	Set	1
xi)	Hydraulic oil (20% of total qty. use	Set	1
xii)	Pressure Relief Device, 3 nos. of each ty	Set	2
<b>2.3 132 kV Circuit Breaker</b>			
a)	Complete Circuit Breaker pole of each type & rating complete with interrupter, main circuit, enclosure and Marshalling Box with operating mechani	Set	3
b)	Fixed, moving and arcing contacts including insulating nozzles 3 nos. of each	Set	1
c)	Rubber gaskets, 'O' rings and seals for SF6 gas of each t	Set	1
d)	Trip coil assembly with resistor as applicable, 3 nos. of each	Set	2
e)	Closing coil assembly with resistor as applicable, 3 nos. of each	Set	2
f)	Molecular filter for SF6 gas with filter bags (10% of total quantity us	LS	1
g)	SF6 Pressure gauge cum switch or Density monitors and pressure switch as applicable, 3 nos each typ	Set	1
h)	Coupling device for pressure gauge cum switch for connecting Gas handling plant, 3 nos of each typ	Set	1
i)	Relays, Power contactors, push buttons, timers & MCBs etc of each type & r	Set	1
j)	Closing assembly/ valve, 3 nos. of each t	Set	2
k)	Trip assembly/ valve, 3 nos. of each t	Set	2
l)	Aux. switch assembly, 3 nos. of each t	Set	1
m)	Operation Counter, 3 nos. of each ty	Set	1
n)	Rupture disc, 3 nos. of each ty	Set	1
o)	Windoscope / Observing window, 3 nos. of each	Set	1
p)	<b>Spring operating closing mechanism one no of each type, if applicable</b>	Set	1

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

q)	<b>Hydraulic operating mechanism, if applicable</b>		
i)	Hydraulic operating mechanism with drive motor , 3 nos of each type if appli	Set	1
ii)	Ferrules, joints and couplings, 3 nos. of each ty	Set	1
iii)	Hydraulic filter, 3 nos. of each ty	Set	1
iv)	Hose pipe, 3 nos. of each ty	Set	1
v)	N2 Accumulator, 3 nos. of each ty	Set	1
vi)	Pressure transducer, 3 nos. of each ty	Set	1
vii)	Valves 3 nos. of each ty	Set	1
viii)	Pipe length (copper & steel) 3 nos. of each size & t	Set	1
ix)	Pressure switches 3 nos. of each ty	Set	1
x)	Pressure gauge with coupling device, 3 nos. of each t	Set	1
xi)	Hydraulic oil (20% of total qty. use	Set	1
xii)	Pressure Relief Device, 3 nos. of each ty	Set	2
<b>3</b>	<b>Isolators</b>		
<b>3.1</b>	<b>400 kV Isolators</b>		
a)	Complete set of 3 nos. of single phase / one no. of 3-phase dis-connector including main circuit, enclosure, driving mechanis	Set	1
b)	Single Phase/Three Phase High speed fault making grounding switch operating mechanismSet complete with all necessary gaskets mounting hardware/operating mechanism complete with all necessary gaskets connecting apparatus	Set	1
c)	3 no. of single phase / one no of 3-phase Earthing switch including main circuit, enclosure, driving mechanisr	Set	1
d)	Copper contact fingers for dis-connector male & female contact –for one complete (3 phase) dis-connector of each type and rati	Set	1
e)	Copper contact fingers for earthing switch male & female contacts- for one complete (3 phase) earthing switch of each type and rat	Set	1
f)	Open / Close contactor assembly, timers, key interlock for one complete (3 phase) dis-connector and (3 phase) earthing switch of each type and ræ	Set	1
g)	Push button switch. each type, as applicæ	Set	1
<b>h)</b>	<b>Limit switches and Aux. Switches for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>i)</b>	<b>Rotor housing bearing assembly for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>j)</b>	<b>Motor with gear assembly for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
k)	Corona shield rings as applicabl	Set	2
<b>l)</b>	<b>Hinge pins for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>m)</b>	<b>Bearings for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
n)	Interlocking coil with resistors, timers, key interlock for complete 3 phase equipment (each and rating)	Set	1
<b>o)</b>	<b>Relays, Power contactors, resistors, fuses, push buttons, timers &amp; MCBs (complete for one 3 phase equipment)</b>		
i)	For isolator	Set	3
ii)	For earth switch	Set	1
p)	Aux. switch assembly (complete) with 10 NO & 10 NC or more contacts for both isolator & earth switch	Set	1
<b>3.2</b>	<b>220 kV Isolators</b>		
a)	Complete set of 3 nos. of single phase / one no. of 3-phase dis-connector including main circuit, enclosure, driving mechanis	Set	1
b)	Single Phase/Three Phase High speed fault making grounding switch operating mechanismSet complete with all necessary gaskets mounting hardware/operating mechanism complete with all necessary gaskets connecting apparatus	Set	1
c)	3 no. of single phase / one no of 3-phase Earthing switch including main circuit, enclosure, driving mechanisr	Set	1

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

d)	Copper contact fingers for dis-connector male & female contact –for one complete (3 phase) dis-connector of each type and rating	Set	1
e)	Copper contact fingers for earthing switch male & female contacts- for one complete (3 phase) earthing switch of each type and rating	Set	1
f)	Open / Close contactor assembly, timers, key interlock for one complete (3 phase) dis-connector and (3 phase) earthing switch of each type and rating	Set	1
g)	Push button switch. each type, as applicable	Set	1
<b>h)</b>	<b>Limit switches and Aux. Switches for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>i)</b>	<b>Rotor housing bearing assembly for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>j)</b>	<b>Motor with gear assembly for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
k)	Corona shield rings as applicable	Set	1
<b>l)</b>	<b>Hinge pins for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>m)</b>	<b>Bearings for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
n)	Interlocking coil with resistors, timers, key interlock for complete 3 phase equipment (each and rating)	Set	1
<b>o)</b>	<b>Relays, Power contactors, resistors, fuses, push buttons, timers &amp; MCBs (complete for one 3 phase equipment)</b>		
i)	For isolator	Set	3
ii)	For earth switch	Set	1
p)	Aux. switch assembly (complete) with 10 NO & 10 NC or more contacts for both isolator & earth switch	Set	1
<b>3.3</b>	<b>132 kV Isolators</b>		
a)	Complete set of 3 nos. of single phase / one no. of 3-phase dis-connector including main circuit, enclosure, driving mechanism	Set	1
b)	Single Phase/Three Phase High speed fault making grounding switch operating mechanism complete with all necessary gaskets mounting hardware/operating mechanism complete with	Set	1
c)	3 no. of single phase / one no of 3-phase Earthing switch including main circuit, enclosure, driving mechanism	Set	1
d)	Copper contact fingers for dis-connector male & female contact –for one complete (3 phase) dis-connector of each type and rating	Set	1
e)	Copper contact fingers for earthing switch male & female contacts- for one complete (3 phase) earthing switch of each type and rating	Set	1
f)	Open / Close contactor assembly, timers, key interlock for one complete (3 phase) dis-connector and (3 phase) earthing switch of each type and rating	Set	1
g)	Push button switch. each type, as applicable	Set	1
<b>h)</b>	<b>Limit switches and Aux. Switches for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>i)</b>	<b>Rotor housing bearing assembly for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>j)</b>	<b>Motor with gear assembly for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>k)</b>	<b>Corona shield rings as applicable</b>	Set	1
<b>l)</b>	<b>Hinge pins for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
<b>m)</b>	<b>Bearings for complete 3 phase equipment</b>		
i)	For isolator	Set	1
ii)	For earth switch	Set	1
n)	Interlocking coil with resistors, timers, key interlock for complete 3 phase equipment (each and rating)	Set	1

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

<b>o)</b>	<b>Relays, Power contactors, resistors, fuses, push buttons, timers &amp; MCBs (complete for one 3 phase equipment)</b>		
i)	For isolator	Set	3
ii)	For earth switch	Set	1
p)	Aux. switch assembly (complete) with 10 NO & 10 NC or more contacts for both isolator & earth switch	Set	1
<b>4</b>	<b>Current Transformer</b>		
<b>4.1</b>	<b>400 KV Current Transformer</b>		
a)	Gas Insulated Complete CT of each type and rating with enclo	Nos.	3
b)	Secondary bushing of each ty	Set	3
<b>4.2</b>	<b>220 KV Current Transformer</b>		
a)	Gas Insulated Complete CT of each type and rating with enclo	Nos.	3
b)	Secondary bushing of each ty	Set	3
<b>4.3</b>	<b>132 KV Current Transformer</b>		
a)	Gas Insulated Complete CT of each type and rating with enclo	Nos.	3
b)	Secondary bushing of each ty	Set	3
<b>5</b>	<b>Voltage Transformer</b>		
<b>5.1</b>	<b>400KV Voltage Transformer</b>		
a)	Gas Insulated Complete PT of each type and rating with enclo	Nos.	3
<b>5.2</b>	<b>220KV Voltage Transformer</b>		
a)	Gas Insulated Complete PT of each type and rating with enclo	Nos.	3
<b>5.3</b>	<b>132KV Voltage Transformer</b>		
a)	Gas Insulated Complete PT of each type and rating with enclo	Nos.	3
	<b>TOTAL A</b>		
<b>B.</b>	<b>AIS Type Outdoor Equipment</b>		
<b>1</b>	<b>Surge Arrester</b>		
1.1	390 kV Surge Arrester with insulating base, terminal connector, Surge counter & accessories	Nos.	3
1.2	216 kV Surge Arrester with insulating base, terminal connector, Surge counter & accessories	Nos.	3
1.3	120 kV Surge Arrester with insulating base, terminal connector, Surge counter & accessories	Nos.	3
<b>2</b>	<b>Erection Hardware</b>		
1.1	160 KN antifog disc insulators, hardware fitting, conductors, PG clamps, connectors including equipments connectors, all accessories etc	LS	1
1.1	120 KN antifog disc insulators, hardware fitting, conductors, PG clamps, connectors including equipments connectors, all accessories etc	LS	1
1.1	70 KN antifog disc insulators, hardware fitting, conductors, PG clamps, connectors including equipments connectors, all accessories etc	LS	1
<b>3</b>	<b>Isolators</b>		
1.1	36 kV isolators (1-phase	No.	1
	<b>TOTAL B</b>		
<b>C.</b>	<b>Relay and Protection Panels</b>		

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

<b>C.1</b>	<b>Breaker Relay Panel</b>		
a)	Breaker failure Relay (numerical type), LI	No.	1
b)	Trip/Close Circuit Supervision Rel	Nos.	2
c)	Self reset trip relay of each ty	No.	1
d)	Auto Reclose relay with check synchronizing relay and dead line charging i	No.	1
e)	Timer relay of each typ	No.	1
f)	DC Supervision relay	No.	1
g)	Hand reset Trip Relay of each ty	No.	1
h)	Flag relays of each typ	No.	1
i)	Auxiliary relays of each ty	No.	1
<b>C.2</b>	<b>Line Protection Panel</b>		
a)	Main-1 Numerical distance relay (excluding external trip relays) with software and cable for Set front panel communication to F		1
b)	Main-2 Numerical distance relay (excluding external trip relays) with software and cable for Set front panel communication to F		1
<b>C.3</b>	<b>Transformer Protection Panel</b>		
a)	Transformer differential protection relay, associated software and cable for front panel communication to PC (in case of numerical rel:	No.	1
b)	Restricted Earth Fault protection relay with non linear resistor and associated software in of numerical rela'	No.	1
c)	Back up protection relay with 3 O/C and E/F element and associated software in case of numerical relay	Set	1
d)	Over fluxing relay	Set	1
e)	Over load relay with time	Set	1
<b>C.4</b>	<b>Common Spares</b>		
a)	Power supply module for Bus Bar Protect	Set	1
b)	Metrosil (Non Linear resistor ) each typ	Set	1
c)	Inter-posing CTs & PTs each typ	Set	1
<b>TOTAL C</b>			
<b>D.</b>	<b>Substation Automation system</b>		
1	Hard disk of each type used in Master station, HMI, Printer server (one set each type & capacity'	Set	1
2	Cable & connectors used in Bay control unit, Master station, HMI, printer server (one set each type'	Set	1
3	Applicable RAM (DIMM / SIMM card) used in Master station, HMI, Printer server (one each Set type'	Set	1
4	Mouse (one set each typ	Set	1
5	Keyboard (one no. each typ	No.	1
6	SMPS used for Master station, HMI, Printer server (one set each ty	Set	1
7	Fan assembly used for Master station, HMI, Printer server (one set each t	Set	1
8	Mass storage device i.e. Optical drive/ CD writer etc. with driver (one set each type)	Set	1
9	Network card with driver (one set of each ty	Set	1
10	VDU with driver (one set of each typ	Set	1
11	Bay control unit with configuration softw:	Set	2
12	Operating systems of Master station, HMI, Printer server with the specified software versionSet in CDROM(i.e. WIN NT, Unix etc.) with manual and device drivers	Set	1
13	Source code and compiler of Application software with detailed manual for Master station, HMI, Printer server	Set	1
14	Auxiliary relays used in bay control unit for control applications (10% of of each type)	Set	1
15	Printer with driver and manual (one set of each ty	Set	1
16	Cartridge for Printer (one set of each typ	Set	2
17	Terminal connectors (male/ female) for optical fibers (one set of each t	Set	5
18	Special tool for making joints and termination in optical fiber with relevant couplers (one set Set each type	Set	1
19	Optical loss measuring kit with relevant accessories and visual Fiber Optic cable inspection Set aid	Set	1
<b>TOTAL D</b>			
<b>E.</b>	<b>Fire Protection System</b>		

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

<b>A.</b>	<b>Fire Detection and Alarm System</b>		
i)	Smoke detectors (photo-electric type)	No.	10% of total population
ii)	Heat detector	Nos.	3
iii)	Electrical Control Panel:Annunciation printed circuits (solid state annunciations) in Control Panel	Set	1
<b>TOTAL E</b>			
<b>F.</b>	<b>DG Set</b>		
i)	Set of filters 1 set (Lube-oil/fuel/Air cleaner)	Set	1
ii)	Solenoid Coil assembly	No.	1
iii)	Self Starter assembly with clutch engaging and disengaging arrangements complete with motors	No.	1
iv)	Lube Oil pressure safety control	No.	1
v)	High water temp. safety control	No.	1
vi)	Diode	Nos.	2
<b>TOTAL F</b>			
<b>G.</b>	<b>Batteries and Battery Charger</b>		
<b>A.1</b>	<b>220V Batteries</b>		
i)	Spare Battery Cell without electrolyte	Nos.	10
ii)	Terminal Connector with Nuts and Bolts	Nos.	10
iii)	Float Level indicator	Nos.	10
iv)	Vent Plugs	Nos.	10
<b>A.2</b>	<b>220V Battery Charger</b>		
i)	Set of Control Cards (All PCB Cards)	Set	1
ii)	Set of relay	Set	1
iii)	Set of contactor	Set	1
iv)	Micro switches	Set	1
v)	Filter capacitor	Set	1
vi)	Three phase full wave bridge rectifier (Thyristor/Diode)	Set	1
vii)	Set of wound resistor	Set	1
viii)	Set of switch	Set	1
ix)	Potentiometer	Set	1
x)	Fuses of Thyristor with indicator	Set	6
<b>B.1</b>	<b>48V Batteries</b>		
i)	Spare Battery Cell without electrolyte	Nos.	10
ii)	Terminal Connector with Nuts and Bolts	Nos.	10
iii)	Float Level indicator	Nos.	10
iv)	Vent Plugs	Nos.	10
<b>B.2</b>	<b>48V Battery Charger</b>		
i)	Set of Control Cards (All PCB Cards)	Set	1
ii)	Set of relay	Set	1
iii)	Set of contactor	Set	1
iv)	Micro switches	Set	1
v)	Filter capacitor	Set	1
vi)	Three phase full wave bridge rectifier (Thyristor/Diode)	Set	1
vii)	Set of wound resistor	Set	1
viii)	Set of switch	Set	1
ix)	Potentiometer	Set	1
x)	Fuses of Thyristor with indicator	Set	6
<b>TOTAL G</b>			
<b>H.</b>	<b>L.T. Switchgear</b>		
i)	Relays	Set	1
ii)	CTs and PTs	Set	1
iii)	Switches/ Push buttons and Meters	Set	1
iv)	TPN Switches/ MCB	Set	1
v)	MCCB of each rating	Set	1
<b>vi)</b>	<b>L.T. Breaker spares</b>		
a)	Spring charging motor	No.	1

Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

	b) Aux. Contact set	Set	2
	c) Busbar Seal off insulator	Nos.	5
	d) Arc Chute	Set	2
	e) Moving contacts	Set	1
	f) Arcing contacts (Fixed/Moving)	Set	1
	g) Springs (Closing/Opening)	No.	1
	h) Closing Coil	No.	1
	i) Tripping Coil	No.	1
	j) Aux. finger contact	Set	1
	k) Limit Switch	Set	1
	l) Jaw contact	Set	1
	m) Busbar insulator	Nos.	5
	n) Interphase barrier	Nos.	2
	o) Busbar strip 1mm (Aluminium)	MTR	5
<b>TOTAL H</b>			
<b>I.</b>	<b>Optical Fibre</b>		
	Terminal connectors (male/ female) for optical fibre	Set	five each type
<b>TOTAL I</b>			
<b>J.</b>	<b>List of Spares for 500 MVA, 400/220/33 kV, Auto Transformer</b>		
1	Oil Cooler Pump with motor	No.	1
2	Expansion Joint (Complete replacement for one transformer)	Set	1
3	Bushing CTs, each type and rating	Set	1
4	Bucchoz relay with complete contact	No.	1
5	Local and remote WTI with contact	No.	1
6	Oil Temp indicator with contact	No.	1
7	Pressure relief device	No.	1
8	Magnetic Oil level gauge	No.	1
9	Cooler fan with motor	No.	1
10	Set of Valves ( of all sizes)	Set	1
11	Fuses (Complete replacement)	Set	1
12	Aux Transformers for the control of cooler control cabinet and Oil	No.	one each type
13	Starter contactors, switches and relays for electrical control panel	No.	one each type
14	Remote tap position indicator	No.	1
15	Oil sampling bottles one liter capacity	Nos.	12
16	Oil surge relay for OLTC	No.	1
17	Complete set of Gaskeys	Nos.	2
18	Neutral bushing (220kV side) complete with metal parts	No.	1
19	Neutral bushing (33kV side) complete with metal parts	No.	1
20	HV end bushing complete with metal parts & gasket	No.	1
21	MV end bushing complete with metal parts & gasket	No.	1
22	LV end bushing complete with metal parts & gasket	No.	1
<b>TOTAL J</b>			
<b>K.</b>	<b>List of Spares for 160 MVA, 220/33/11 kV, Auto Transformer</b>		
1	Oil Cooler Pump with motor	No.	1
2	Expansion Joint (Complete replacement for one transformer)	Set	1
3	Bushing CTs, each type and rating	Set	1
4	Bucchoz relay with complete contact	No.	1
5	Local and remote WTI with contact	No.	1
6	Oil Temp indicator with contact	No.	1
7	Pressure relief device	No.	1
8	Magnetic Oil level gauge	No.	1
9	Cooler fan with motor	No.	1
10	Set of Valves ( of all sizes)	Set	1
11	Fuses (Complete replacement)	Set	1
12	Aux Transformers for the control of cooler control cabinet and Oil	No.	one each type
13	Starter contactors, switches and relays for electrical control panel	No.	one each type
14	Remote tap position indicator	No.	1
15	Oil sampling bottles one liter capacity	Nos.	12
16	Oil surge relay for OLTC	No.	1
17	Complete set of Gaskeys	Nos.	2
18	Neutral bushing (220kV side) complete with metal parts	No.	1
19	Neutral bushing (33kV side) complete with metal parts	No.	1
20	HV end bushing complete with metal parts & gasket	No.	1
21	MV end bushing complete with metal parts & gasket	No.	1
22	LV end bushing complete with metal parts & gasket	No.	1
<b>TOTAL K</b>			



Project : 400/220/132 kV GIS SUBSTATION , Rasra, Ballia

Customer : UPPTCL

<b>L.</b>	<b>List of Spares for 125 MVAR, 420 kV, Reactor</b>		
1	HV bushing with metal parts and gask	No.	1
2	Radiator Section	No.	1
3	Oil temperature indicatc	No.	1
4	Fault pressure relay and gas accumulation rel	No.	1
5	Liquid level gauge	No.	1
6	Silicagel dehydrating breathe	No.	1
7	Pressure relief devic	No.	1
8	Winding temperature indicato	No.	1
<b>TOTAL L</b>			
<b>M.</b>	<b>List of Spares for Lighting</b>		
1	5% of each type of linghting fixture supplied	SET	1
<b>TOTAL M</b>			