

BILL OF QUANTITIES FOR ERECTION, TESTING AND COMMISSIONING**PROJECT : 400/132 kV SWITCHYARD PACKAGE FOR BARH SUPER THERMAL POWER PROJECT (3X660MW)****CUSTOMER : NATIONAL THERMAL POWER CORPORATION****A. MAIN SCOPE**

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
A	400 kV MAIN EQUIPMENTS				
1	400kV, 3150A, 40kA Circuit Breaker with operating mechanism and marshalling box and associated structures.				
	- With closing resistor	Nos.	8		
	- Without closing resistor	Nos.	5		
	400kV, 2000A, 40kA Circuit Breaker with operating mechanism and marshalling box and associated structures.(Suitable for Reactor Switching)	Nos.	2		
	- Without closing resistor				
	400kV, 2000A, 40kA Circuit Breaker with operating mechanism and marshalling box and associated structures				
	- Without closing resistor	Nos.	7		
2	400kV, 3150A, 40kA HCB isolator complete with operating mechanism boxes terminal connectors, etc.				
	- With 1 E/S	Nos.	32		
	400kV, 2000A, 40kA HCB isolator complete with operating mechanism boxes terminal connectors, etc.				
	- With 1 E/S	Nos.	24		
	400kV, 3150A, 40kA HCB isolator complete with operating mechanism boxes terminal connectors, etc.				
	- With 2 E/S	Nos.	4		
3	400kV, 2000A Current Transformer	Nos.	51		
4	400kV, 3000A Current Transformer	Nos.	60		
5	400kV, 4400pF Capacitor Voltage Transformer.	Nos.	30		
6	390 kV Surge Arrestor (Gapless type) with surge monitors and terminal connectors, etc.	Nos.	36		
7	400 kV Wave Trap 3150A				
	(I) 0.5 mH	Nos.	8		
	(ii) 1.0 mH	Nos.	4		
8	400 kV Solid Core Post Insulator				
	400kV Bus Post Insulator	Nos.	327		
	400 kV Post Insulators for Isolators	Nos.	360		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
9	400 kV 80 MVAR Shunt Reactor for BUS	Nos.	1		
10	Terminal Connectors for Main equipment				
	Terminal connectors for circuit breaker	Nos	132		
	Terminal connectors for CVT	Nos	32		
	Terminal connectors for CTs	Nos	226		
11	CT & CVT Junction Boxes				
	Marshalling boxes for CT's	Nos	37		
	Marshalling boxes for CVT's	Nos	10		
B	400kV CLASS MISCELLANEOUS ITEMS				
1	420kV Double Tension string insulator (120kN) assembly with double anchoring points with 25 Nos. antifog type disc insulators per string with all hardware accessories including arcing horn and tension clamp set suitable for				
a)	"Quadruple Moose" ACSR conductor with 450mm subconductor spacing (sets)				
	- with turn buckle				
	I. Insulator	Nos.	78		
	ii. Hardware	Nos.	78		
	- without turn buckle				
	I. Insulator	Nos.	78		
	ii. Hardware	Nos.	78		
b)	"Twin Moose" ACSR conductor with 450mm subconductor spacing (sets)				
	- with turn buckle				
	I. Insulator	Nos.	42		
	ii. Hardware	Nos.	42		
	- without turn buckle				
	I. Insulator	Nos.	42		
	ii. Hardware	Nos.	42		
2	420 kV Single Suspension String insulator (120 KN) assembly with 25 nos. antifog type disc insulators with all hardware accessories including arcing horn with				
a)	Drop clamp set suitable for "Quadruple Moose" ACSR with 450mm sub conductor spacing (sets)				
	I. Insulator	Nos.	30		
	ii. Hardware	Nos.	30		
b)	Drop clamp set suitable for "Twin Moose" ACSR with 450mm sub conductor spacing (sets)				
	I. Insulator	Nos.	18		
	ii. Hardware	Nos.	18		
3	Buspost insulator clamp suitable for 4" IPS Al. Tube Rigid/sliding (Nos.)	Nos.	137		
4	Buspost insulator clamp suitable for 4" IPS Al. Tube to accommodate welding sleeve	Nos.	50		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
5	Buspost insulator clamp suitable for 4" IPS Al. Tube to twin moose ACSR conductor	Nos.	5		
6	Buspost insulator clamp suitable for 4" IPS Al. Tube Expansion type	Nos.	62		
7	Interconnector for 4" IPS Al. Tube to Quad Moose ACSR conductor	Nos.	92		
8	Interconnector for 4" IPS Al. Tube to twin moose ACSR conductor	Nos.	12		
9	Welding sleeves 600mm long for 4" IPS Al. Tube	Nos.	236		
10	Spacers for 'Quad Moose' ACSR with 450mm sub-conductor spacing				
	i) Flexible	Nos.	1300		
	ii) Rigid	Nos.	174		
11	Spacers for 'Twin Moose' ACSR with 450mm sub-conductor spacing				
	i) Flexible	Nos.	506		
	ii) Rigid	Nos.	95		
12	Corona bell to suit 4" IPS Al. Tube (nos.)	Nos.	44		
13	4" IPS Aluminium Tube (mtrs.)	Mtrs	4800		
14	T-clamp suitable for Twin ACSR Moose to single ACSR Moose	Nos.	50		
15	Buspost Insulator clamp suitable for quad moose ACSR conductor (Nos.)	Nos.	2		
16	Buspost Insulator clamp suitable for twin moose ACSR conductor (Nos.)	Nos.	2		
C	132 kV MAIN EQUIPMENT				
1.	132 kV, 1250A, 31.5KA Circuit Breaker with operating mechanism, marshalling box, associated structures etc.	Nos.	7		
2.	132 kV, 2000A, 31.5 KA Circuit Breaker with operating mechanism and marshalling box and associated structures etc.	No.	1		
3.	132 kV, 1250A, 31.5 kA HCB standard Isolator complete with operating mechanism boxes terminal connectors, etc.				
	- with 1 E/S	Nos..	7		
	- with 2 E/S	Nos.	7		
4.	132 kV, 2000A, 31.5 kA HCB standard isolator complete with operating mechanism boxes etc.				
	- with 2 E/S	No.	2		
5.	132kV, 1250A, 31.5kA Tandem isolator complete with operating mechanism boxes etc.				
	- w/o E/S	Nos.	7		
6.	132kV, 1200A Current Transformer (120% extending rating)	Nos.	21		
	Terminal Connector suitable for 3" Al Tube	Nos.	42		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
7.	132kV, 1200A Current Transformer (150% extending rating)	Nos.	3		
	Terminal Connector suitable for 3" Al Tube	Nos.	3		
	Terminal Connector suitable for Twin Moose ACSR	Nos.	3		
8.	132 kV, Capacitor Voltage Transformer				
	(I) 8800 pF	Nos.	6		
9.	120 kV Surge Arrestor (Gapless type) with surge monitors etc.	Nos.	36		
	Terminal Connector suitable for single moose	Nos.	24		
	Terminal Connector suitable for twin moose	Nos.	12		
10	132 kV Solid Core Post Insulators				
10.1	132kV Bus Post Insulator	Nos.	42		
10.2	132 kV Post Insulators for Isolators	Nos.	138		
11	Terminal Connectors for Main Equipments				
11.1	Terminal Connectors for 1250 A circuit breakers	Nos.	42		
11.2	Terminal connectors for 2000A circuit breaker	Nos.	6		
11.3	Terminal connectors for 1250A HCB Isolator	Nos.	126		
11.4	Terminal Connector for 2000A HCB Isolator	Nos.	12		
11.5	Terminal Connectors for CVTs	Nos.	6		
12	CT & CVT JB's	Nos.	10		
D	132 kV CLASS MISCELLANEOUS ITEMS				
1.	145 kV double tension insulator string assembly (120kN per string) with 10 Nos. fog type disc insulator per string with all hardware accessories for Twin Moose ACSR with 250 mm subconductor spacing with tension clamp set suitable for				
	(a) with turn buckle				
	I. Insulator	Nos.	33		
	ii. Hardware	Nos.	33		
	(b) without turn buckle				
	I. Insulator	Nos.	33		
	ii. Hardware	Nos.	33		
2.	145 kV single suspension string insulator assembly with 10 Nos. 120 kN antifog type disc insulator per string with all hardware accessories for suitable for Pilot/ drop type clamp for twin 'Moose' ACSR with 250 mm sub-conductor spacing (set)				
	I. Insulator	Nos.	30		
	ii. Hardware	Nos.	30		
3.	145 kV single tension string insulator assembly with 10 Nos. 120 kN antifog type disc insulator per string with all hardware accessories for suitable for tension clamp for twin 'Moose' ACSR conductor (set)				
	a) with turn buckle				
	I. Insulator	Nos.	6		
	ii. Hardware	Nos.	6		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	b) Without turn buckle				
	i. Insulator	Nos.	6		
	ii. Hardware	Nos.	6		
4.	145 kV single suspension string insulator assembly with 10 Nos. 120 kN antifog type disc insulator per string with all hardware accessories for single 'Moose' ACSR with suspension / drop clamp (set)				
	i. Insulator	Nos.	6		
	ii. Hardware	Nos.	6		
5	Buspost insulator clamp suitable for 3" IPS Al. Tube Rigid/sliding	Nos.	9		
6	Buspost insulator clamp suitable for 3" IPS Al. Tube to accommodate welding sleeve	Nos.	21		
7	Buspost insulator clamp suitable for 3" IPS Al. Tube Expansion type	Nos.	14		
8	Buspost insulator clamp suitable for single 'moose' ACSR conductor	Nos.	2		
9	Buspost insulator clamp suitable for "Twin Moose" ACSR conductor	Nos.	2		
10	Interconnector for 3" IPS Al. Tube to single 'moose' ACSR conductor	Nos.	5		
11	Interconnector for 3" IPS Al. Tube to twin moose ACSR conductor	Nos.	4		
12	Welding sleeves for 3" IPS Al. Tube (nos.)	Nos.	24		
13	Terminal connector of the 132 kV cable sealing and suitable for single "Moose" ACSR conductor (nos.)	Nos.	18		
14	Terminal connector of the 132 kV cable sealing and suitable for "Twin Moose" ACSR conductor (nos.)	Nos.	6		
15	Terminal connector of the 132 kV cable sealing and suitable for 3" IPS Al. Tube (Nos.)	Nos.	6		
16	T-clamp suitable for Twin ACSR Moose to single ACSR Moose	Nos.	30		
17	Spacers for 'Twin Moose' ACSR with 250mm subconductor spacing	Nos.	267		
18	Corona Bell to suit 3" IPS Al. Tube	Nos.	9		
19	3" IPS Aluminium Tube (mtrs.)	Mtrs	750		
E	Common for 400 kV & 132 kV Class Miscellaneous Items				
1	T-clamp suitable for single ACSR Moose to single ACSR Moose	Nos.	852		
2	PG Clamp suitable for ACSR Moose to Moose	Nos.	38		
3	Grounding conductor				
	a) 75mm x 12mm GS flat for equipment and structure earthing	Mtrs	4270		
	b) 50mm x 6mm GS flat for operating mechanism earthing	Mtrs	1065		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	c) 40mm dia 3000mm long M.S.Rods, all associated accessories like U-clamp, etc.	Nos.	164		
	d)40mm dia 3000mm long treated pipe electrode all associated accessories like U-clamp, etc.	Nos.	10		
4	Cleat type clamps for				
	a) Earthing down conductor (10.98mm dia)	Nos.	590		
	b) 75 x 12mm G.S. flat	Nos.	2750		
	c) 50 x 6mm G.S. flat	Nos.	600		
5	Bay Marshalling Kiosks	Nos.	17		
6	Earthwire tension clamps with D-Shackle assembly	Nos.	50		
7	Earthwire tension clamps (Compression type) with Flexible Copper Bond (Nos.) complete with Anchor Shackle, bolts etc. as specified in the specification	Nos.	20		
8	T-clamp for GS earthwire of 10.98mm dia (7/3.66mm)	Nos.	50		
9	Pad type compressive clamp for earthwire down conductor	Nos.	50		
10	G.I. Pipes including bends for cabling (Medium class as per IS:1239 (Part-I) & IS:4736 (mtrs.)				
	i) 50mm dia.	Mtrs	450		
	ii) 100 mm dia.	Mtrs	950		
	iii) 200 mm dia.	Mtrs	450		
	iv) 300 mm dia.	Mtrs	500		
11	Galvanised Ladder type Tray with fittings,bends and with side coupler plates, bolts,nuts, washers, etc.				
	i) 100mm wide	Mtrs	400		
	ii) 300 mm wide	Mtrs	500		
	iii) 600 mm wide	Mtrs	1300		
12	50x50x6mm (750mm long) angles to be welded for cable racks	Nos.	13280		
13	ACSR Moose conductor (mtrs.)	Mtrs	42400		
14	10.98mm dia G.S. earthwire (mtrs.)	Mtrs	4150		
15	Lugs for 10.98mm dia earthwire (no.)	Nos.	50		
16	40mm dia M.S. Rod for grounding (m)	Mtrs	34000		
17	Burried cable trench 300 mm wide(m)	Mtrs	300		
18	1.1 kV grade Power cables including laying, supply of cable glands, cable lugs and termination, etc. (km)				
	a) 3 ^{1/2} x 35 mm ² AL PVC	km	5.6		
	b) 3 ^{1/2} x 16 mm ² AL PVC	km	7.5		
	c) 4c x 6mm ² AL PVC	km	4		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	d) 2cx6 mm ² AL PVC	km	3.5		
	e) 1cx2.5mm ² CU flexible lighting wire (km)	km	3		
19	1.1kV, XLPE, armoured 1Cx630 mm ² power cable with suitable no. of lugs for termination at 2x1.0 MVA transformer and LT Switchgear	km	2		
20	LT SWITCHGEAR				
a)	Switchyard 415V, ACDB 1 & 2	set	1		
b)	Switchyard Lighting Board	set	1		
c)	220V Switchyard DCDB	set	1		
d)	48V Switchyard DCDB	set	1		
21	DC BATTERIES				
a)	220V, 400AH Plante Battery	Sets	2		
b)	48V, 400AH Plante Battery	Sets	2		
22	DC BATTERY CHARGERS				
a)	100A, 220V DC Battery chargers (Float cum boost)	Sets	2		
b)	100A, 48V DC Battery chargers (Float cum boost)	Sets	2		
F	STRUCTURAL STEEL				
1	Installation of Pipe Type support structure for the following equipment fabricated from steel tube IS:806 including nuts, bolts, gusset plate, foundation bolts, equipment mounting bolts and other accessories complete as per design & drawing.				
a)	400 kV Standard Gang operated HCB Isolator				
	--- with 1 E/S (three phase)	Nos.	56		
	--- with 2 E/S (three phase)	Nos.	4		
b)	390 kV Surge Arrestor gapless type	Nos.	36		
c)	400kV Capacitor Voltage Transformer	Nos.	30		
d)	400 kV Bus Post Insulator (single phase)	Nos.			
e)	400 kV , Wave Trap (Single Phase)	Nos.	12		
f)	132 kV Standard Gang operated HCB Isolator				
	--- with 1 E/S (three phase)	Nos.	7		
	-- with 2 E/S (three phase)	Nos.	9		
g)	132 kV Standard Gang operated Tandem Isolator				
	---- w/o E/S	Nos.	7		
h)	120 kV Surge Arrestor gapless type	Nos.	36		
i)	132 kV Capacitor Voltage Transformer	Nos.	6		
j)	132 kV Bus Post Insulator (single phase)	Nos.	42		
2	Installation of Lattice type structures for the following equipment fabricated from structural steel conforming to IS:2062 including nuts, bolts, gusset plate, foundation bolts, equipment mounting bolts and other accessories complete as per design & drawing prepared by the contractor /vendor & approved by the Employer.				
a)	400 kV Current Transformer (single phase)	Nos.	111		
b)	132 kV Current Transformer (single phase)	Nos.	24		
c)	132 kV Cable sealing end	Nos.	36		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
3	Installation of lattice type structures for the following structure fabricated from structural steel conforming to IS:2062 including nuts, bolts, gusset plate, foundation bolts, equipment mounting bolts and other accessories complete as per design & drawing prepared by the contractor / vendor based on structure layout drg. No. 9558-572-POE-A-012&16 Rev A and approved by Employer.				
a)	Tower T1 (400 kV)	Nos.	30		
b)	Tower T1P (400 kV)	No.	0		
c)	Tower T2 (400 kV)	Nos.	10		
d)	Tower T2P (400 kV)	No.	0		
e)	Tower T3 (400 kV)	Nos.	5		
f)	Tower T3P (400 Kv)	Nos.	4		
g)	Tower T4 (400 kV)	Nos.	2		
h)	Tower T5 (400kV)	Nos.	18		
i)	Tower T6 (400 kV)	Nos.	9		
j)	Tower T7 (400 kV)	No.	1		
k)	Tower T8 (400 kV)	Nos.	10		
l)	Tower T9 (132 kV)	Nos.	7		
m)	Tower T10 (132 kV)	Nos.	5		
n)	Tower T11 (132 kV)	Nos.	3		
o)	Tower T12(132kV)	Nos.	5		
p)	Tower T13 (132 kV)	Nos.	3		
q)	Tower T14 (132kV)	Nos.	6		
r)	Lighting Mast (400 kV) 48M height	Nos.	14		
s)	LM (132 kV) 37.5M height	Nos.	4		
t)	Girder G1 (400 kV)	Nos.	24		
u)	Girder G2 (400kV)	Nos.	11		
v)	Girder G3 (400 kV)	Nos.	18		
w)	Girder G4 (132 kV)	Nos.	10		
x)	Girder G5 (132 kV)	Nos.	10		
TOTAL AMOUNT (Rs.)					

Notes for ETC works

- 1 Loading / Unloading, handling, shifting to & from stores, proper storage, assembly, installation, pre-commissioning test and commissioning tests are included in the scope.
- 2 MS welding - apply red lead paint then aluminium paint then bitumen after welding
- 3 GS welding - apply 2 coats of cold galvanising anti corrosive paint after welding
- 4 10% welding joints in earthing shall be tested for dye penetration test.
- 5 Quoted rates are deemed to be inclusive of miscellaneous works, viz.. Erection of clamps and connectors, phase colour discs etc.

BILL OF QUANTITIES FOR ERECTION, TESTING AND COMMISSIONING**PROJECT : 400/132 kV SWITCHYARD PACKAGE FOR BARH SUPER THERMAL POWER PROJECT (3X660MW)****CUSTOMER : NATIONAL THERMAL POWER CORPORATION****B. SPARE**

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
A	400 kV MAIN EQUIPMENTS				
1	400kV, 3150A, 40kA Circuit Breaker with operating mechanism and marshalling box and associated structures.				
	- With closing resistor	Nos.	0		
	- Without closing resistor	Nos.	0		
	400kV, 2000A, 40kA Circuit Breaker with operating mechanism and marshalling box and associated structures.(Suitable for Reactor Switching)	Nos.	0		
	- Without closing resistor				
	400kV, 2000A, 40kA Circuit Breaker with operating mechanism and marshalling box and associated structures				
	- Without closing resistor	Nos.	0		
2	400kV, 3150A, 40kA HCB isolator complete with operating mechanism boxes terminal connectors, etc.				
	- With 1 E/S	Nos.	0		
	400kV, 2000A, 40kA HCB isolator complete with operating mechanism boxes terminal connectors, etc.				
	- With 1 E/S	Nos.	0		
	400kV, 3150A, 40kA HCB isolator complete with operating mechanism boxes terminal connectors, etc.				
	- With 2 E/S	Nos.	0		
3	400kV, 2000A Current Transformer	Nos.	1		
4	400kV, 3000A Current Transformer	Nos.	1		
5	400kV, 4400pF Capacitor Voltage Transformer.	Nos.	2		
6	390 kV Surge Arrestor (Gapless type) with surge monitors and terminal connectors, etc.	Nos.	1		
7	400 kV Wave Trap 3150A				
	(I) 0.5 mH	Nos.	0		
	(ii) 1.0 mH	Nos.	0		
8	400 kV Solid Core Post Insulator				
	400kV Bus Post Insulator	Nos.	2		
	400 kV Post Insulators for Isolators	Nos.	2		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
9	400 kV 80 MVAR Shunt Reactor for BUS	Nos.	0		
10	Terminal Connectors for Main equipment				
	Terminal connectors for circuit breaker	Nos	0		
	Terminal connectors for CVT	Nos	0		
	Terminal connectors for CTs	Nos	0		
11	CT & CVT Junction Boxes				
	Marshalling boxes for CT's	Nos	0		
	Marshalling boxes for CVT's	Nos	0		
B	400kV CLASS MISCELLANEOUS ITEMS				
1	420kV Double Tension string insulator (120kN) assembly with double anchoring points with 25 Nos. antifog type disc insulators per string with all hardware accessories including arcing horn and tension clamp set suitable for				
a)	"Quadruple Moose" ACSR conductor with 450mm subconductor spacing (sets)				
	- with turn buckle				
	i. Insulator	Nos.	8		
	ii. Hardware	Nos.	8		
	- without turn buckle				
	i. Insulator	Nos.	9		
	ii. Hardware	Nos.	9		
b)	"Twin Moose" ACSR conductor with 450mm subconductor spacing (sets)				
	- with turn buckle				
	i. Insulator	Nos.	5		
	ii. Hardware	Nos.	5		
	- without turn buckle				
	i. Insulator	Nos.	3		
	ii. Hardware	Nos.	3		
2	420 kV Single Suspension String insulator (120 KN) assembly with 25 nos. antifog type disc insulators with all hardware accessories including arcing horn with				
a)	Drop clamp set suitable for "Quadruple Moose" ACSR with 450mm sub conductor spacing (sets)				
	i. Insulator	Nos.	2		
	ii. Hardware	Nos.	2		
b)	Drop clamp set suitable for "Twin Moose" ACSR with 450mm sub conductor spacing (sets)				
	i. Insulator	Nos.	2		
	ii. Hardware	Nos.	2		
3	Buspost insulator clamp suitable for 4" IPS Al. Tube Rigid/sliding (Nos.)	Nos.	15		
4	Buspost insulator clamp suitable for 4" IPS Al. Tube to accommodate welding sleeve	Nos.	5		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
5	Buspost insulator clamp suitable for 4" IPS Al. Tube to twin moose ACSR conductor	Nos.	1		
6	Buspost insulator clamp suitable for 4" IPS Al. Tube Expansion type	Nos.	6		
7	Interconnector for 4" IPS Al. Tube to Quad Moose ACSR conductor	Nos.	10		
8	Interconnector for 4" IPS Al. Tube to twin moose ACSR conductor	Nos.	2		
9	Welding sleeves 600mm long for 4" IPS Al. Tube	Nos.	23		
10	Spacers for 'Quad Moose' ACSR with 450mm sub-conductor spacing				
	I) Flexible	Nos.	130		
	ii) Rigid	Nos.	18		
11	Spacers for 'Twin Moose' ACSR with 450mm sub-conductor spacing				
	I) Flexible	Nos.	50		
	ii) Rigid	Nos.	10		
12	Corona bell to suit 4" IPS Al. Tube (nos.)	Nos.	0		
13	4" IPS Aluminium Tube (mtrs.)	Mtrs	0		
14	T-clamp suitable for Twin ACSR Moose to single ACSR Moose	Nos.	5		
15	Buspost Insulator clamp suitable for quad moose ACSR conductor (Nos.)	Nos.	0		
16	Buspost Insulator clamp suitable for twin moose ACSR conductor (Nos.)	Nos.	0		
C	132 kV MAIN EQUIPMENT				
1.	132 kV, 1250A, 31.5KA Circuit Breaker with operating mechanism, marshalling box, associated structures etc.	Nos.	0		
2.	132 kV, 2000A, 31.5 KA Circuit Breaker with operating mechanism and marshalling box and associated structures etc.	No.	0		
3.	132 kV, 1250A, 31.5 kA HCB standard Isolator complete with operating mechanism boxes terminal connectors, etc.				
	- with 1 E/S	Nos..	0		
	- with 2 E/S	Nos.	0		
4.	132 kV, 2000A, 31.5 kA HCB standard isolator complete with operating mechanism boxes etc.				
	- with 2 E/S	No.	0		
5.	132kV, 1250A, 31.5kA Tandem isolator complete with operating mechanism boxes etc.				
	- w/o E/S	Nos.	0		
6.	132kV, 1200A Current Transformer (120% extending rating)	Nos.	1		
	Terminal Connector suitable for 3" Al Tube	Nos.	2		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
7.	132kV, 1200A Current Transformer (150% extending rating)	Nos.	0		
	Terminal Connector suitable for 3" Al Tube	Nos.	0		
	Terminal Connector suitable for Twin Moose ACSR	Nos.	0		
8.	132 kV, Capacitor Voltage Transformer				
	(I) 8800 pF	Nos.	2		
9.	120 kV Surge Arrestor (Gapless type) with surge monitors etc.	Nos.	1		
	Terminal Connector suitable for single moose	Nos.	0		
	Terminal Connector suitable for twin moose	Nos.	1		
10	132 kV Solid Core Post Insulators				
10.1	132kV Bus Post Insulator	Nos.	2		
10.2	132 kV Post Insulators for Isolators	Nos.	2		
11	Terminal Connectors for Main Equipments				
11.1	Terminal Connectors for 1250 Acircuit breakers	Nos.	2		
11.2	Terminal connectors for 2000A circuit breaker	Nos.	2		
11.3	Terminal connectors for 1250A HCB Isolator	Nos.	1		
11.4	Terminal Connector for 2000A HCB Isolator	Nos.	1		
11.5	Terminal Connectors for CVTs	Nos.	2		
12	CT & CVT JBs	Nos.	0		
D	132 kV CLASS MISCELLANEOUS ITEMS				
1.	145 kV double tension insulator string assembly (120kN per string) with 10 Nos.fogtype disc insulator per string with all hardwares accessories for Twin Moose ACSR with 250 mm subconductor spacing with tension clamp set suitable for				
	(a) with turn buckle				
	I. Insulator	Nos.	3		
	ii. Hardware	Nos.	3		
	(b) without turn buckle				
	I. Insulator	Nos.	4		
	ii. Hardware	Nos.	4		
2.	145 kV single suspension string insulator assembly with 10 Nos. 120 kN antifog type disc insulator per string with all hardwares accessories for suitable for Pilot/ drop type clamp for twin 'Moose" ACSR with 250 mm sub-conductor spacing (set)				
	I. Insulator	Nos.	3		
	ii. Hardware	Nos.	3		
3.	145 kV single tension string insulator assembly with 10 Nos. 120 kN antifog type disc insulator per string with all hardwares accessories for suitable for tension clamp for twin 'Moose" ACSR conductor (set)				
	a) with turn buckle				
	I. Insulator	Nos.	1		
	ii. Hardware	Nos.	1		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	b) Without turn buckle				
	i. Insulator	Nos.	1		
	ii. Hardware	Nos.	1		
4.	145 kV single suspension string insulator assembly with 10 Nos. 120 kN antifog type disc insulator per string with all hardwares accessories for single 'Moose' ACSR with suspension / drop clamp (set)				
	i. Insulator	Nos.	1		
	ii. Hardware	Nos.	1		
5	Buspost insulator clamp suitable for 3" IPS Al. Tube Rigid/sliding	Nos.	3		
6	Buspost insulator clamp suitable for 3" IPS Al. Tube to accommodate welding sleeve	Nos.	2		
7	Buspost insulator clamp suitable for 3" IPS Al. Tube Expansion type	Nos.	2		
8	Buspost insulator clamp suitable for single 'moose' ACSR conductor	Nos.	0		
9	Buspost insulator clamp suitable for "Twin Moose" ACSR conductor	Nos.	0		
10	Interconnector for 3" IPS Al. Tube to single 'moose' ACSR conductor	Nos.	2		
11	Interconnector for 3" IPS Al. Tube to twin moose ACSR conductor	Nos.	1		
12	Welding sleeves for 3" IPS Al. Tube (nos.)	Nos.	2		
13	Terminal connector of the 132 kV cable sealing and suitable for single "Moose" ACSR conductor (nos.)	Nos.	2		
14	Terminal connector of the 132 kV cable sealing and suitable for "Twin Moose" ACSR conductor (nos.)	Nos.	1		
15	Terminal connector of the 132 kV cable sealing and suitable for 3" IPS Al. Tube (Nos.)	Nos.	1		
16	T-clamp suitable for Twin ACSR Moose to single ACSR Moose	Nos.	4		
17	Spacers for 'Twin Moose' ACSR with 250mm subconductor spacing	Nos.	34		
18	Corona Bell to suit 3" IPS Al. Tube	Nos.	3		
19	3" IPS Aluminium Tube (mtrs.)	Mtrs	0		
E	Common for 400 kV & 132 kV Class Miscellaneous Items				
1	T-clamp suitable for single ACSR Moose to single ACSR Moose	Nos.	90		
2	PG Clamp suitable for ACSR Moose to Moose	Nos.	4		
3	Grounding conductor				
	a) 75mm x 12mm GS flat for equipment and structure earthing	Mtrs	0		
	b) 50mm x 6mm GS flat for operating mechanism earthing	Mtrs	0		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	c) 40mm dia 3000mm long M.S.Rods, all associated accessories like U-clamp, etc.	Nos.	0		
	d)40mm dia 3000mm long treated pipe electrode all associated accessories like U-clamp, etc.	Nos.	0		
4	Cleat type clamps for				
	a) Earthing down conductor (10.98mm dia)	Nos.	0		
	b) 75 x 12mm G.S. flat	Nos.	0		
	c) 50 x 6mm G.S. flat	Nos.	0		
5	Bay Marshalling Kiosks	Nos.	0		
6	Earthwire tension clamps with D-Shackle assembly	Nos.	0		
7	Earthwire tension clamps (Compression type) with Flexible Copper Bond (Nos.) complete with Anchor Shackle, bolts etc. as specified in the specification	Nos.	0		
8	T-clamp for GS earthwire of 10.98mm dia (7/3.66mm)	Nos.	0		
9	Pad type compressive clamp for earthwire down conductor	Nos.	0		
10	G.I. Pipes including bends for cabling (Medium class as per IS:1239 (Part-I) & IS:4736 (mtrs.)				
	i) 50mm dia.	Mtrs	0		
	ii) 100 mm dia.	Mtrs	0		
	iii) 200 mm dia.	Mtrs	0		
	iv) 300 mm dia.	Mtrs	0		
11	Galvanised Ladder type Tray with fittings,bends and with side coupler plates, bolts,nuts, washers, etc.				
	i) 100mm wide	Mtrs	0		
	ii) 300 mm wide	Mtrs	0		
	iii) 600 mm wide	Mtrs	0		
12	50x50x6mm (750mm long) angles to be welded for cable racks	Nos.	0		
13	ACSR Moose conductor (mtrs.)	Mtrs	0		
14	10.98mm dia G.S. earthwire (mtrs.)	Mtrs	0		
15	Lugs for 10.98mm dia earthwire (no.)	Nos.	0		
16	40mm dia M.S. Rod for grounding (m)	Mtrs	0		
17	Burried cable trench 300 mm wide(m)	Mtrs	0		
18	1.1 kV grade Power cables including laying, supply of cable glands, cable lugs and termination, etc. (km)				
	a) 3 ^{1/2} x 35 mm ² AL PVC	km	0		
	b) 3 ^{1/2} x 16 mm ² AL PVC	km	0		
	c) 4c x 6mm ² AL PVC	km	0		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	d) 2cx6 mm ² AL PVC	km	0		
	1cx2.5mm ² CU flexible lighting wire (km)	km	0		
			0		
19	1.1kV, XLPE, armoured 1Cx630 mm ² power cable with suitable no. of lugs for termination at 2x1.0 MVA transformer and LT Switchgear	km	0		
20	LT SWITCHGEAR				
a)	Switchyard 415V, ACDB 1 & 2	set	0		
b)	Switchyard Lighting Board	set	0		
c)	220V Switchyard DCDB	set	0		
d)	48V Switchyard DCDB	set	0		
21	DC BATTERIES				
a)	220V, 400AH Plante Battery	Sets	0		
b)	48V, 400AH Plante Battery	Sets	0		
22	DC BATTERY CHARGERS				
a)	100A, 220V DC Battery chargers (Float cum boost)	Sets	0		
b)	100A, 48V DC Battery chargers (Float cum boost)	Sets	0		
F	STRUCTURAL STEEL				
1	Installation of Pipe Type support structure for the following equipment fabricated from steel tube IS:806 including nuts, bolts, gusset plate, foundation bolts, equipment mounting bolts and other accessories complete as per design & drawing.				
a)	400 kV Standard Gang operated HCB Isolator				
	--- with 1 E/S (three phase)	Nos.	0		
	--- with 2 E/S (three phase)	Nos.	0		
b)	390 kV Surge Arrestor gapless type	Nos.	0		
c)	400kV Capacitor Voltage Transformer	Nos.	0		
d)	400 kV Bus Post Insulator (single phase)	Nos.	0		
e)	400 kV , Wave Trap (Single Phase)	Nos.	0		
f)	132 kV Standard Gang operated HCB Isolator				
	--- with 1 E/S (three phase)	Nos.	0		
	-- with 2 E/S (three phase)	Nos.	0		
g)	132 kV Standard Gang operated Tandem Isolator				
	---- w/o E/S	Nos.	0		
h)	120 kV Surge Arrestor gapless type	Nos.	0		
i)	132 kV Capacitor Voltage Transformer	Nos.	0		
j)	132 kV Bus Post Insulator (single phase)	Nos.	0		
2	Installation of Lattice type structures for the following equipment fabricated from structural steel conforming to IS:2062 including nuts, bolts, gusset plate, foundation bolts, equipment mounting bolts and other accessories complete as per design & drawing prepared by the contractor /vendor & approved by the Employer.				
a)	400 kV Current Transformer (single phase)	Nos.	0		
b)	132 kV Current Transformer (single phase)	Nos.	0		
c)	132 kV Cable sealing end	Nos.	0		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
3	Installation of lattice type structures for the following structure fabricated from structural steel conforming to IS:2062 including nuts, bolts, gusset plate, foundation bolts, equipment mounting bolts and other accessories complete as per design & drawing prepared by the contractor / vendor based on structure layout drg. No. 9558-572-POE-A-012&16 Rev A and approved by Employer.				
a)	Tower T1 (400 kV)	Nos.	0		
b)	Tower T1P (400 kV)	No.	0		
c)	Tower T2 (400 kV)	Nos.	0		
d)	Tower T2P (400 kV)	No.	0		
e)	Tower T3 (400 kV)	Nos.	0		
f)	Tower T3P (400 Kv)	Nos.	0		
g)	Tower T4 (400 kV)	Nos.	0		
h)	Tower T5 (400kV)	Nos.	0		
i)	Tower T6 (400 kV)	Nos.	0		
j)	Tower T7 (400 kV)	No.	0		
k)	Tower T8 (400 kV)	Nos.	0		
l)	Tower T9 (132 kV)	Nos.	0		
m)	Tower T10 (132 kV)	Nos.	0		
n)	Tower T11 (132 kV)	Nos.	0		
o)	Tower T12(132kV)	Nos.	0		
p)	Tower T13 (132 kV)	Nos.	0		
q)	Tower T14 (132kV)	Nos.	0		
r)	Lighting Mast (400 kV) 48M height	Nos.	0		
s)	LM (132 kV) 37.5M height	Nos.	0		
t)	Girder G1 (400 kV)	Nos.	0		
u)	Girder G2 (400kV)	Nos.	0		
v)	Girder G3 (400 kV)	Nos.	0		
w)	Girder G4 (132 kV)	Nos.	0		
x)	Girder G5 (132 kV)	Nos.	0		
	TOTAL AMOUNT (Rs.)				

Notes for Spares

- 1 Unloading, storage & handling only in the scope for quantity mentioned under spares.