Corrigendum-I

Dt. 13.01.2023

Tender Ref: TPCODL/P&S/1000000339 / 22-23

With reference to above Tender, following corrigendum is hereby issued,

(A)Following additional/ revised provisions are incorporated to the Qualification Criteria (Clause No-1.7) :

- The Bidder who have been already allotted Two (02) Packages by OPTCL for ODSSP Phase-IV project shall not be eligible to participate in this tender.
- The Bidder already allotted one (01) Package by OPTCL for ODSSP Phase-IV project shall be allowed to execute maximum one more package currently floated under Phase-IV of ODSSP scheme.
- The bidders or Holding / Associate / Subsidiary Companies or its any group company who have earlier failed to execute even any order of the TPCODL/ OPTCL/ DISCOMs of Odisha/ Govt. Of Odisha/ any other utility in India or Odisha/ TPCL or who stand currently debarred / blacklisted by TPCODL/ OPTCL/ DISCOMs of Odisha/ any other utility in India or Odisha/ TPCL shall not be eligible to participate in this tender.

(B) GTP/ additional specification is attached.

All other terms and conditions of the original tender remain unaltered.

Sd/-

Chief (Procurement & Store), TPCODL

CH- E-24 – GTP CONTENT Phase-IV-ODSSP

GTP No	Name of Items
1	33kV VCB (Indoor)
2	11kV VCB (Indoor)
3	33kV VCB (Outdoor)
4	11kV CT
5	33kV CT
6	33kV Insulator (B &S)
7	11kV Insulator (B &S)
8	LT Distribution Box
9	POWER TRF
10	STATION TRF 100 kVA
11	Transformer oil
12	33kv HG fuse
13	11kv HG fuse
14	33kv Isolator
15	11kV Isolator
16	33KV AB SWITCH
17	11KV AB SWITCH
18	100sqmm AAAC
19	148sqmm AAAC
20	33kv Pin Insulator
21	11kv Pin Insulator
22	33 kV Surge arrester
23	11kv Surge arrester
24	Numerical relay
25	33kV IVT
26	11 kV IVT
27	33kV & 11kV V cross arm
28	HT STAY SET
29	Stay Wire
30	Tension Clamp
31	Suspension Clamp
32	Back Clamp
33	Flexible Cu bond
34	Earthing Pipe
35	Earthing Coil
36	LT 3 half-core
37	LT 4-CORE
38	LT 2-CORE
39	ACSR Zebra

GTP NO -1 Guaranteed Technical Particulars of 33 KV VCB (Indoor)			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	33KV	
5	Highest system voltage	36KV	
6	Rated normal current at 50˚C		
i)	For Bus-bar of Circuit Breaker	1250A	
ii)	For Interrupter	1250A	
7	Rated short circuit breaking current (rms)	25KA	
8	Rated short circuit making current (peak)	62.5KA	
9	Rated short time current withstand capability for 3 sec.	25 kA	
10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	70kV	

ii)	Impulse withstand voltage to earth with 1 .2/50psec, wave of +ve and —ve polarity (Peak)	170KV	
11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	48 V DC/230V A.C	
17	Rated supply voltage for trip/close coil	48V D.C	
18	Total break time in MS		
(a)	At 10% rated interrupting capacity	<80ms	
(b)	At rated interrupting current	<80ms	
19	Arcing Time	<15ms	
20	Make time	<100ms	
21	Minimum reclosing time at full rated interrupted MVA from the instant of Trip coil energisation	300ms	
22	Minimum dead time for 3 phase closing	300ms	
23	one time dry power frequency withstand test voltage between line terminal and ground objects	70kv	
24	one time dry power frequency withstand test voltage between terminal with breaker contacts open	80kv	

25	Type of main contacts		
26	Type of Aux. Contacts		
27	Materials of auxilliary contacts	Copper Alloy	
28	Voltage distribution between breaker		
29	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	ii) those open when breaker is closed	6	
30	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring operated	
	ii)Closing	Spring charged due to closing both manual and motorized Spring operated	
31	Frequency at which contacts are to be replaced	After 100 full short circuit operations	
32	Number of terminal connectors	6	
33	Short circuit type test certificate furnished		
34	Circuit breaker weight		

GTP NO-2 Guaranteed Technical Particulars of 11kV Circuit Breaker(Indoor)			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	11 kV	
5	Highest system voltage	12kV	
6	Rated normal current at 50˚C		
i)	For Bus-bar of Circuit Breaker	1250A	
ii)	For Interrupter	630A	
7	Rated short circuit breaking current (rms)	25kA	
8	Rated short circuit making current (peak)	62.5kA	
9	Rated short time current withstand capability for 3 sec.	25kA	

10	Rated insulation level:		
i)	one time dry power frequency withstand test voltage between line terminal and ground objects	28kV	
ii)	one time dry power frequency withstand test voltage between terminal with breaker contacts open	32 kV	
iii)	Impulse withstand voltage to earth with 1 .2/50 µsec, wave of +ve and —ve polarity (Peak)	75KV	
11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C	
17	Rated supply voltage for trip/close coil	48 V D.C	
18	Total break time in ms		
(a)	At 10% rated interrupting capacity	<80ms	
(b)	At rated interrupting current	<80ms	
19	Arcing Time	<15ms	
20	Make time	<100ms	

21	Minimum reclosing time at full rated interrupted MVA	300ms	
22	Minimum dead time for 3 phase closing	300ms	
23	Type of main contacts		
24	Type of Aux. Contacts		
25	Materials of auxilliary contacts	Copper Alloy	
26	Voltage distribution between breaker		
27	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	ii) those open when breaker is closed	6	
28	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring	
	ii)Closing	Spring charged due to closing both manual and motorized Spring operated	
29	Frequency at which contacts are to be replaced	After 100 full short circuit	
30	Number of terminal connectors	6	
31	Short circuit type test certificate furnished		
32	Circuit breaker weight		

GTP NO - 3 Guaranteed Technical Particulars of 33 KV VCB (Outdoor)			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	33KV	
5	Highest system voltage	36KV	
6	Rated normal current at 50˚C		
i)	For Interrupter	1250A	
7	Rated short circuit breaking current (rms)	25KA	
8	Rated short circuit making current (peak)	62.5KA	
9	Rated short time current withstand capability for 3 sec.	25KA	
10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	70kv	
ii)	Impulse withstand voltage to earth with 1 .2/50psec, wave of +ve and —ve polarity (Peak)	170KV	

11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C	
17	Rated supply voltage for trip/close coil	48V D.C	
18	Minimum creepage distance (mm)	900 mm	
19	Minimum protected creepage distance (mm)	As Per IS	
20	Total break time in MS		
21	At 10% rated interrupting capacity	<80ms	
21 a	At rated interrupting current	<80ms	
21 b	Arcing Time	<15ms	
22	Make time	<100ms	

23	Minimum reclosing time at full rated interrupted MVA from the instant of Trip coil energisation	300ms	
24	Minimum dead time for 3 phase closing	300ms	
25	one time dry power frequency withstand test voltage between line terminal and ground objects	70kv	
26	onemin dry power frequency withstand test voltage between terminal with breaker contacts open	80kV	
27	Type of main contacts		
28	Type of Aux. Contacts		
29	Materials of auxilliary contacts	Copper Alloy	
30	Voltage distribution between breaker		
31	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	i) those open when breaker is closed	6	
32	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring operated	
	ii) Closing	Spring charged due to closing both manual and motorized Spring operated	

33	Frequency at which contacts are to be replaced	After 100 full short circuit operations	
34	Nos of terminal connector	6	
35	Short circuit type test certificate furnished		
36	Circuit breaker weight		
37	Minimum clearance in air		
	i) Between phases	>480mm	
	ii)Live parts to earth	>320mm	
	iii) Live parts to ground level	>3700mm	
	iv)Between Liver parts & ground object	>320mm	
38	Bushing of insulators		
	i) Type of bushing	Porcelain	
	ii)Dry 1 min power frequency withstand test voltage	70kV	
	iii) Dry flash over value	>75kV	

	iv) Wet flashover value	>75kV	
	v) 1.2/50 impulse withstand	170KVp	
	vi) Creepage distance	900 mm	
	vii) Puncture value of bushing	>75kV	
	viii)Weight of bushing	<45kG	

GTP NO - 4 GUARANTEED TECHNICAL PARTICULARS FOR 11KV CURRENT TRANSFORMERS

Sl. No.	Name of the Particulars	Desired Value	Bidder's Offer
1	Make		
2	Type of CT Installation	Single phase, dead tank, oil-filled Poly Crate hermetically sealed outdoor, self-cooled.	
3	Type of mounting	Pedestal type	
4	Suitable for system frequency	50 HZ (- 5% to +3%)	
5	Rated Voltage (KV rms)	11	
6	Nominal System Voltage (KV rms)	11	
7	Highest System Voltage (KV rms)	12	
8	Current Ratio (A/A)	400-200 -100/1-1 A	
9	Method of earthing the system where the current transformers will be installed	Effectively earthed	
10	Rated Continous Thermal Current (A)	120% of rated primary current	
11	Acceptable limit of temperature rise above 50^0C ambient temperature for continuous operation at rated continuous thermal current		
	(a)Winding	40^0C	
	(b) OIL	35^0C	

	(c)External surface of the core, metallic parts in contact with or adjacent to, insulation.	40ºC	
12	1.2/50 micro second lighting impulse withstand voltage (kVP) (dry)	75	
13	1 Minute dry power frequency withstand voltage primary (kV rms)	28	
14	1 Minute dry power frequency withstand voltage secondary (KV rms)	3	
15	Minimum creepage distance of porcelain Housing (mm)	350	
16	Rated short time withstand current for 3 second duration at all ratios (KA rms)	25	
	Instrument security factor at all ratios for metering core	Not more than 5.0	
17	Maximum rated short time thermal current density of the primary winding copper conductor (A/mm2) at all ratios	92	
18	Type of Core	Torroidal type	
19	Seismic acceleration	0. 15g (Vertical)	
		0.3g (Horizontal)	
20	Accuracy class of standard C.T to be used during testing towards determination of ratio errors and phase angle errors for metering cores.	0.05 or better.	

GTP NO -5 GUARANTEED TECHNICAL PARTICULARS FOR 33 KV CURRENT TRANSFORMERS			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Type of CT/Installation.	Single phase, dead tank, oil filled, hermetically sealed, outdoor, self-cooled	
3	Type of mounting.	Pedestal type	
4	Suitable for system frequency.	50 HZ (+ 5 % to -3%)	
5	Rated voltage (KV rms)	33	
6	Nominal system voltage (KV rms)	33	
7	Highest system voltage (KV rms)	36	
8	Current ratio (A/A)	a) 400-200/1-1-1A	
9	Method of earthing the system where the current transformer will be installed.	Solidly Effectively earthed.	
10	Rated continuous thermal current (A)	120 % of rated primary current	

11	Acceptable limit of temperature rise above 50°C ambient temperature for continous operation at rated continuous thermal current.		
(a)	Winding	45°C	
(b)	Oil	40°C	
(c)	External surface of the core, metallic parts in contact with or adjacent to, insulation.	4 5°C	
12	Acceptable partial discharge level	Less than 10 pico coulombs	
13	Maximum radio interference voltage at 1.1 times the maximum rated voltage.	Less than 500 micro volts	
14	l.2/50 micro second lightning impulse withstand voltage (KVP) (dry)	170	
15	1 minute dry power frequency withstand voltage primary (KV rms)	70	
16	Switching Impulse with stand and voltage (KVP)		
17	l Minute dry power frequency withstand voltage secondary (KV rms)	3	
18	Minimum creepage distance of porcelain Housing (mm)	900	
19	Rated short time withstand current for 3 second at all ratios (KA rms)	25KA	
20	Instrument security factor at all ratios for metering core.	Not more than 5.0	

21	Minimum rated short time thermal current density of the primary winding at all ratios ($A/mm^{2)}$	As per clause No9.6.3- Note of IS: 2705 (Part-I)/l992	
22	Application, current ratio, output burden, accuracy class, minimum knee point voltage, secondary winding resistance, maximum excitation current at minimum knee point voltage etc.		
23	Type of core		
24	Seismic acceleration	0.15g (Vertical) 0.3g (Horizontal)	
25	Accuracy class of standard C.T. to be used during testing towards determination of ratio errors and phase angle errors for metering cores.	0.05 or better.	

GTP No-48 Guaranteed Technical Particulars of 33 kv Insulator-90 KN (B & S Type)			
Sl. No.	Particulars	Desired Value	Bidder's Data
1	Name of the Manufacturer		
2	Type of Insulator	Polymer Composite	
3	Standard according to which the insulators manufactured and tested.	IEC 61109	
4	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA	
(a)	Material of core(FRP rod)	ECR or BORRON FREE	
	(I) E-glass of ECR-glass.		
	(II)Boom content		
(b)	Material of housing Et weathersheds (silicon content by weight)	SILICON RUBBER 43 %	
(c)	Material of end fittings	SGI	
(d)	Sealing compound for end fittings	RTV SILICON	
5	Colour	GREY	
6	Electrical Characterstics		
(a)	Nominal system voltage	33 KV	

(b)	Highest system voltage	36 KV	
(c)	Dry Power frequency withstand voltage	105 KV	
(d)	Wet Power frequency withstand voltage	75 KV	
(e)	Dry flashover voltage	80 KV	
(f)	Wet flash over voltage	75 KV	
(g)	Dry lighting impulse withstand voltage		
	(a) Positive	170 KV	
	(b) Negative	170 KV	
	b) Negative.	180 KV	
(h)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.	40	
(i)	Creepage distance (Min.)	900 MM	
7	Mechanical characteristics Minimum failing load.	90KN	
8	Dimensions of insulator		

(i)	Weight	1 .6	
(ii)	Dia of FRP rod	16 MM	

(iii)	Length of FRP rod	440 MM	
(iv)	Dia of weathersheds	100 MM	
(v)	Thickness of housing	3 MM	
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight) enclosed.	382 MM	
9	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression moulding)	Injection moulding	
10	No of weathersheds	8	
11	Type of sheds		
i)	Aerodynamic	Aerodynamic	
ii)	With underribds		
12	Type of packing	Wooden Box	

13	Any other particulars which the bidder may like to give.		
14	The insulators shall have "W" type phosphors Bronze security clips for ball sockets portion of insulators confirming to IS-2486 (P-III/1 974).	YES	

GTP NO-49 Guaranteed Technical Particulars of 11 kv Insulator (B & S Type)			
BIDDER HAS TO CONFIRM FOLLOWING IMPORTANT REQUIREMENT:			
Sl. No.	Particulars	Desired Value	Bidder's Data
1	Name of the Manufacturer :		
2	Type of Insulator	Polymeric Composite	
3	Standard according to which the insulators manufactured and tested.	IEC 61109	
4	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA	
(a)	Material of core(FRP rod)	ECR or BORRON FREE	
	(I)E-glass of ECR-glass.		
	(II)Boom content		
(b)	Material of housing Et weathersheds (silicon content by weight)	SILICON RUBBER 43 %	
(c)	Material of end fittings	SGI	
(d)	Sealing compound for end fittings	RTV SILICON	
5	Colour	GREY	

6	Electrical Characterstics		
(a)	Nominal system voltage	11 KV	
(b)	Highest system voltage	12 KV	
(c)	Dry Power frequency withstand voltage	45 KV	
(d)	Wet Power frequency withstand voltage	35 KV	
(e)	Dry flashover voltage	50 KV	
(f)	Wet flash over voltage	40 KV	
7	Dry lighting impulse withstand voltage		
	(a) Positive	75 KV	
	(b) Negative	75 KV	

8	No of weathersheds	3	
9	Type of sheds		
i)	Aerodynamic	Aerodynamic	
ii)	With underribds		
10	Type of packing	Wooden Box	
11	The insulators shall have "W" type phosphors Bronze security clips for ball sockets portion of insulators confirming to IS-2486 (P-III/1974).	YES	
12	Any other particulars which the bidder		

GTP No-8 LT Distribution Box

Sl No	Dimension / Description	63 KVA	Bidder''s offer	100 KVA	Bidder''s offer
1	A	700		1000	
2	B	600		800	
3	C	400		500	
4	D	80		170	
5	E	90		250	
6	Incomer 4Pole MCCB	100 A, with Over Current Setting 80% to 100%		200 A, with Over Current Setting 80% to 100%	
7	Cable Size for Incomer	50 mm2 , 3 1/2 core cable		95 mm2 , 3 1/2 core cable	
8	Three Pole MCCB for out- going feeder	50 Amp, with Over Current Setting 80% to 100% (2sets each)		100 Amp, with Over Current Setting 80% to 100% (2sets each)	

GTP No-8 LT Distribution Box

9	Bus Bar for Incoming & Out going feeders	25 x 6 mm		40 x 6 mm	
10	Bus Bar material	Electrolytic Aluminium		Electrolytic Aluminium	
11	A neutral Bus bar similar to phase Bus bar is to be provided.				

GTP NO-9 GUARANTEED TECHNICAL PARTICULARS FOR POWER TRANSFORMERS OF 5 MVA & 8 MVA		
Sl. No .	**Name of the Particulars**	**Bidder's offer**
1	Name and address of the Manufacturer	
a)	Transformer	
b)	HV & LV Bushings	
c)	Bimetallic connectors	
d)	Transformer Oil	
e)	On load tap changer	
f)	Instruments	
g)	Neutral Bushing CTs	
2	Service (Indoor / Outdoor)	
3	Normal continuous rating in KVA under site conditions at all taps :	
a)	HV winding (KVA)	
b)	LV winding (KVA)	
4	Rated Voltage	
a)	HV winding (KV)	
b)	LV winding (KV)	
5	Rated frequency (Hz)	
6	No. of phases	
7	Type of transformer	
8	Connections	
a)	HV winding	
b)	LV winding	
9	Connections symbols	
	HV – LV	
10	Tappings	

a)	Range	
b)	Number of steps	
c)	Position of tapping on HT winding for high voltage variation	
11	Reference ambient temperatures	
a)	Maximum ambient air temperature (^{0}C)	
b)	Maximum daily average ambient temperature (^{0}C)	
c)	Minimum ambient air temperature (^{0}C)	
d)	Maximum yearly weighted average ambient temperature (^{0}C)	
12	Maximum temperature rise over ambient temperature	
a)	Top oil by thermometer (^{0}C)	
b)	HV & LV windings by resistance measurement (0C)	
c)	Hot Spot Temperature rise of windings(^{o} C)	
d)	Limit for hot spot temperature for which the transformer is designed (^{o} C)	
e)	Temperature gradient between windings and oil (^{0}C)	
f)	Type of maximum winding temperature indicator (^{0}C)	
13	Voltage to earth for which the star point will be insulated	
14	Cooling type	
15	Losses	
a)	No-Load loss at rated voltage & rated frequency (KW)	
b)	Load loss at rated current at Normal Tap at 75^0 C (KW)	
16	Max. Current density in winding at rated current for normal tap position	
a)	HV winding (Amps/ sq.mm.)	
b)	LV winding (Amps / sq.mm.)	
17	Impedance voltage at rated current ,rated frequency and at 75^0 C expressed as percentage of rated voltage at :-	
a)	Principal (normal) tap (%)	
b)	Highest tap (%)	

c)	Lowest tap (%)	
18	Reactance at rated current & frequency as percentage of rated voltage at:	
a)	Principal (normal) tap	
b)	Highest Tap	
c)	Lowest Tap	
19	Resistance at 75^{O} C	
a)	H.V. winding at normal tap position	
b)	L.V. winding	
c)	Resistance voltage drop at 75^{O} C winding temperature expressed as percent of rated voltage (%)	
	i) Principal/ normal tap	
	ii)Highest tap	
	iii) Lowest tap	
20	Insulation level	
a)	Separate source power frequency voltage withstand	
	i) HV winding (KV rms)	
	ii)LV winding (KV rms)	
b)	Induced over voltage withstand	
	i) HV winding (KV rms)	
	ii)LV winding (KV rms)	
c)	Full wave lightning impulse withstand voltage	
	i) HV winding (KV peak)	
d)	Power frequency high voltage tests	
	i) Test voltage for one minute withstand test on high voltage windings (induced)	
	ii) Test voltage for one minute withstand test on low voltage windings	
	iii) Test voltage for one minute withstand test on neutral end of low voltage windings	
e)	Lightning impulse withstand tests	

	i) Impulse test on high voltage winding 1.2/50 p sec full wave withstand (KV peak)	
	ii) Impulse test on low voltage winding 1.2/50 p sec full wave withstand (KV peak)	
	iii) Wave form for impulse test	
21	No load current, no load loss, no load power factor at normal ratio and frequency (Amp/ KW/ P.F.)	
a)	10 percent of rated voltage	
b)	25 percent of rated voltage	
c)	50 percent of rated voltage	
d)	85 percent of rated voltage	
e)	100 percent of rated voltage	
f)	105 percent of rated voltage	
g)	110 percent of rated voltage	
h)	112.5 percent of rated voltage	
i)	115 percent of rated voltage	
j)	120 percent of rated voltage	
k)	121 percent of rated voltage	
22	Efficiency at 75° C at unity power factor	
a)	Full load	
b)	75% load	
c)	50% load	
d)	25% load	
23 (a)	The minimum percentage of load at which the transformer will run at maximum efficiency (%)	
b)	Maximum efficiency of the transformer	
24	Regulation at full load at 75° C	
a)	At unity power factor (%)	
b)	At 0.8 power factor (lagging) (%)	
25	Core data	
a)	Grade of core material used	
b)	Thickness of core plate lamination (mm)	

c)	Whether core laminations are of HIB cold rolled grain oriented	
d)	Details of oil ducts in core, if any	
	i) Whether in the plane & at right angle to the plane of winding	
	ii) Across the plane of lamination	
e)	i) Insulation of core lamination	
	ii) Insulation of core plates	
	iii) Type of core joints(Mitred or Mitred Step-lap)	
26	Flux density	
a)	Designed maximum flux density at rated voltage and rated frequency (Tesla)	
b)	Designed maximum operating flux density which the transformer can withstand for one minute at normal tap (Tesla)	
c)	Designed maximum operating flux density which the transformer can withstand for five seconds at normal tap (Tesla)	
27	Inter-Tap insulation	
a)	Extent of extreme end turns reinforcement	
b)	Extent of end turns reinforcement	
c)	Extent of turn adjacent to tapping reinforced	
d)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (a)	
e)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (b)	
f)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (c)	
28	Windings:	
a)	Material	
b)	Type of windings:	
	i) HV windings	
	ii) LV windings	

c)	Insulation of HV windings	
d)	Insulation of LV windings	
e)	Insulation between HV & LV windings	
29	Continuous rating under following conditions:	
a)	At 40°C ambient air temp. at site	
b)	At 30°C ambient air temp. at site	
c)	At 20°C ambient air temp. at site	
30	Transformer Tank	
a)	Material	
b)	Thickness	
	- Top	
	- Sides	
	- Bottom	
c)	Details of painting	
	- Inner surface	
	- Outer surface	
31	Dimensions of 3 phase transformers:	
a)	Max. Height to top of bushings (mm)	
b)	Over-all length (mm)	
c)	Over-all breadth (mm)	
32	Weight data of transformer components : (Tolerance + 5%) (approximate values not allowed)	
a)	Core excluding clamping (Kg)	
b)	Core with clamping (Kg)	
c)	HV winding insulated conductor (Kg)	
d)	LV winding Insulated conductor (Kg)	
e)	Coils with insulation (Kg.)	
f)	Core and windings (Kg)	
g)	Weight of steel (Kg)	
h)	Fittings and accessories (Kg)	
i)	Oil required for first filling including 10% extra (ltrs / Kg)	
	1. Oil in main tank (Ltrs)	

	2. Oil in the conservator (Ltrs)	
	3. Oil in the radiators (Ltrs)	
	4. Oil in the OLTC (Ltrs.)	
	5. Overall total quantity of oil with 10% extra oil for first filling (ltrs / Kg)	
j)	1. Transportation weight excluding accessories (Kg)	
	2. Shipping details	
	i) Weight of heaviest package (Kg.)	
	ii) Dimension of largest package (Kg)	
k)	Untanking weight (Kg)	
l)	Total weight of transformer with oil and fittings (Kg)	
33	Bushing data :	
a)	Type of bushing insulator	
	i) HV	
	ii) LV	
	iii) Neutral	
b)	Material of bushing (inner part / outer part)	
c)	Weight of bushing insulator (Kg.)	
d)	Quantity of oil in one bushing (lt.)	
e)	Minimum dry withstand & flash over power frequency voltage of bushing (KV)	
f)	Minimum wet withstand & flash over power frequency voltage of bushing (KV)	
g)	Minimum withstand & flashover impulse level (KV)	
h)	Voltage rating (KV)	
i)	Current rating (Amps.)	
j)	Thermal Short Time current & Duration	
k)	Rated Dynamic current & its duration	
l)	Cantilever with stand loading	
m)	Clearance in oil	
	- phase to phase (mm)	

	- phase to earth (mm)	
n)	Creepage distance in oil & air (mm)	
o)	Minimum level of immersing / medium (oil) (mm)	
p)	Maximum pressure of immersing medium (oil) Kg/ cm^2	
q)	Free space required at top for removal of bushings (mm)	
r)	Angle of mounting	
34	Details of CT to be provided in the neutral for REF protection.	
a)	Outdoor bushing type	
b)	No. of cores and their function	
c)	Location (Line / Neutral)	
d)	Current rating for various cores (Primary / Secondary)	
e)	VA burden / Knee Point voltage (Core wise)	
f)	Magnetising current at half knee point voltage. (mA)	
g)	Classification (PS class) core wise	
h)	Test voltage	
i)	Construction details	
35	Conservator (Main Transformer and OLTC)	
a)	Total volume of the Conservator (Cub mtr / Ltr.)	
b)	Volume of the conservator between the highest and lowest level (Cubic mtr. / Ltrs)	
36	Calculated time constants for natural cooling	
37	Type of axial coil supports :	
a)	HV winding	
b)	LV winding	
38	Details of On Load tap changer	
a)	Make	
b)	Type	
c)	Rating	

	i) Rated Voltage	
	ii) Rated current	
	iii) Step voltage	
	iv) Number of steps	
	v)Rated Short Circuit Current	
d)	Whether Diverter switch provided with gas vent and buchholz relay (Yes / No)	
e)	Whether a separate oil surge relay with trip contacts provided (Yes / No)	
f)	Pressure relief valve	
g)	Details of motor device unit housed in kiosk / mounted on tap changer	
	h) running Whether Remote control panel provided with Control scheme for simultaneous operation of Tap changer when transformers are in parallel and independent control when in independent	
i)	Details of equipment in the OLTC kiosk	
j)	Details of OLTC panels	
	i) automatic tap changer relay	
	ii) literature of all the relays	
	iii) dimensions of OLTC, Panel L x B x H	
	iv) thickness of sheet	
	v) degree of protection	
	vi) details of equipment supplied	
39	Dispatch details :	
a)	Approx. mass of heaviest Package (Kg)	
b)	Approx. dimensions of largest Package	
	i) Length (mm)	
	ii) Breadth (mm)	

	iii) Height (mm)	
40	Un-tanking height (mm)	
41	Bimetallic connectors HV / LV	
a)	Normal current rating (A)	
b)	Short time current rating (A)	
c)	Tensile strength (Kg)	
d)	Maximum temperature limit	
e)	Dimensional sketch enclosed indicating tolerances (Yes/No)	
f)	Minimum clearance (mm)	
	- Phase to phase	
	- Phase to Earth	
	42CORE ASSEMBLY :-	
a)	Core diameter (mm)	
b)	Core window height (mm)	
c)	Core leg centre (mm)	
d)	Gross core cross – sectional area (m^2)	
e)	Total height of core (mm)	
f)	Details of top end frame	
g)	Details of Bottom end frame	
h)	Details of clamp plate (material, thickness, insulation)	
i)	Total core weight (Kg)	
j)	Core loss, basing on core loss graph at operating flux density (rated voltage and rated frequency) (KW)	
k)	Core stacking factor	
l)	Net core area (Sq.m)	
m)	Margin towards corner joints, cross-fluxing, dielectric loss (KW)	
n)	Total core loss at rated voltage and rated frequency (KW)	
o)	Describe location / method of core grounding	
p)	Details of core- belting	
	i)Material , grade and type	

	ii) Width	
	iii) Thickness	
	iv)Fixing method	
43	DETAILS OF WINDING	
a)	Type of winding	
b)	Material of the winding conductor	
c)	Maximum current density of windings at rated current and conductor area	
d)	Whether windings are pre-shrunk ?	
e)	Whether adjustable coil clamps are provided for HV and LV windings ?	
f)	Whether steel rings are used for the windings ? If so, whether these are split ?	
g)	Whether electrostatic shields are provided to obtain uniform voltage distribution in the windings ?	
h)	Winding Insulation (Type & Class)	
i)	Insulating material , used for	
	i) H.V winding	
	ii) LV winding	
	iii) Tapping connection	
j)	Insulating material used between	
	i) L.V and H.V winding	
	ii)Core & L.V winding	
k)	H.V to H.V winding between phases	
l)	Type of axial supports	
	i) H.V winding	
	ii) L.V winding	
m)	Type of radial supports	
	i) H.V winding	
	ii) L.V winding	
n)	Maximum allowable torque on coil clamping bolts	
o)	Clamping ring details	
	i) Thickness of ring mm	

	ii)Diameter of ring mm	
	iii)No. & size of pressure screw	
p)	Bare conductor size (mm)	
	i) HV	
	ii)LV	
q)	Insulated conductor size (mm)	
	i) HV	
	ii)LV	
r)	No. of conductor in parallel (Nos.)	
	i) HV	
	ii)LV	
s)	No. of turns / phase	
	i) HV	
	ii)LV	
t)	No. of discs / phase	
	i) HV	
	ii)LV	
u)	No. of turns / Disc	
	i) HV	
	ii)LV	
v)	Gap between discs (mm)	
	i) HV	
	ii)LV	
w)	Inside diameter (mm)	
	i) HV	
	ii)LV	
x)	Outside diameter (mm)	
	i) HV	
	ii)LV	
y)	Axial height after shrinkage (mm)	
	i) HV	
	ii)LV	
z)	D.C Resistance	
i)	L.V winding at 75^0 C (Ohms)	

ii)	H.V winding at normal tap at 75^0 C (Ohms)	
iii)	H.V winding at highest tap at 75^0 C (Ohms)	
iv)	H.V winding at lowest tap at 75^0 C (Ohms)	
v)	Total I^2R losses at 75^0 C for normal tap (KW)	
vi)	Total I^2R losses at 75^0 C for highest tap (KW)	
vii)	Total I^2R losses at 75^0 C for lowest tap (KW)	
vii i)	Stray losses including eddy current losses in winding at 75^0 C (KW)	
	a) Normal tap position	
	b) Highest tap position	
	c) Lowest tap position	
	d) Any special measures, taken to reduce eddy current losses and stray losses. Mention in details	
ix)	Load losses at 75^0 C (I^2 R + Stray)	
	a) Normal tap position (KW)	
	b) Highest tap position (KW)	
	c) Lowest tap position (KW)	
x)	Details of special arrangement, provided to improve surge voltage distribution in the windings.	
44	DETAILS OF TANK :	
a)	Material of Transformer tank	
b)	Type of tank	
c)	Thickness of sheet (No approximate value to be mentioned)	
	i) Sides (mm)	
	ii) Bottom (mm)	
	iii) Cover (mm)	
	iv) Radiators (mm)	

d)	Inside dimensions of main tank (No approximation in dimensions to be used)	
	i) Length (mm)	
	ii) Breadth (mm)	
	iii) Height (mm)	
e)	Outside dimensions of main tank (No approximation in dimensions to be used)	
	i) Length (mm)	
	ii) Breadth (mm)	
	iii) Height (mm)	
f)	Vacuum recommended for hot oil circulation (torr / mm of Hg)	
g)	Vacuum to be maintained during oil filling in transformer tank (torr / mm of Hg)	
h)	Vacuum to which the tank can be subjected without distortion (torr / mm of Hg)	
i)	No. of bi-directional wheels provided	
j)	Track gauge required for the wheels	
	i) Transverse axis	
	ii) Longitudinal axis	
k)	Type and make of pressure relief device and minimum pressure at which it operates (Kpa)	
45	CONSERVATOR :-	
a)	Thickness of sheet (mm)	
b)	Size (Dia x length) (mm)	
c)	Total volume (Litres)	
d)	Volume between the highest and lowest visible oil levels (Litres)	

GTP NO- 10 GUARANTEED AND OTHER PARTICULARS FOR 100kVA STATION TRANSFORMERS			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Name of Manufacturer		
3	Place of Manufacture		
4	Voltage Ratio	33/0.4kV	
5	Rating in kVA	100kVA	
6	Core Material used and Grade:		
	a)	Flux density	
	b)	Over fluxing without saturation	
		(Curve to be furnished by the	
		Manufacturer in support of his claim)	
7	Maximum temperature rise of:		
	a)	windings by resistance method	
	b)	Oil by thermometer	
8	Magnetizing (no-load) current at:		
	a)	90% Voltage	
	b)	100% Voltage	
	c)	110% Voltage	
9	Core loss in watts:		
	a)	Normal voltage	
	b)	Maximum voltage	
10	Resistance of windings at 20°C,75^{0}C		
	(with 5% tolerance)		
a)	HV Winding (ohms)		
b)	LV Winding (ohms)		
11	Load losses (watts) at 75°C at normal tap(100% Load Condition)		

12	TOTAL Losses (Load loss +No Load Loss)at 100% load at 75°C at rated Voltage, frequency & at normal tap.		
13	Total Losses at 50% load at 75°C		
14	Current density used for: (Ampere/sq mm)		
	a)	HV Winding.	
	b)	LV Winding.	
15	Clearances: (mm)		
	a)	Core and LV	
	b)	LV and HV	
	c)	HV Phase to phase	
	d)	End insulation clearance to	
	e)	Any point of winding to tank.	
16	Efficiency at 75°C		
	a)	Unity P.F and	
	b)	0.8 P.F.	
	1)	125°C load	
	2)	100°C load	
	3)	75°C load	
	4)	50°C load	
	5)	25°C load	
17	Regulation at:		
	a)	Unit P.F.	
	b)	0.8 P.F. at 75ºC	
18	% Impedance at 75ºC		
19	Flash test:-		
	(i)	HV 70 kV/ 50HZ for 1 minute	
	(ii)	LV 3 kV /50 Hz for 1 minutes.	
20	Over potential test (Double voltage and		
	Double frequency for 1 minute)		

21	Impulse test.		
22	Mass of : (kg)		
	a)	Core lamination (minimum)	
	b)	Windings (minimum)	
	c)	Tank and fittings	
	d)	Oil	
	e)	Oil quantity (minimum) (litre)	
	f)	Total weight	
23	Oil Data:		
	1)	Quantity for first filling (minimum) (litre)	
	2)	Grade of oil used.	
	3)	Maker's name	
	4)	BDV at the time of filling (kV)	
24	Transformer:		
	1)	Overall length x breadth x height (mm x mm x mm)	
	2)	Tank length x breadth x height	
	3)	Thickness of plates for	
	a)	Side plate (min)	
	b)	Top and bottom plate (min)	
	4)	Conservator Dimensions.	
25	Radiation:		
	1) excluding	Heat dissipation by tank walls top and bottom	
	2)	Heat dissipation by cooling tube	
	3)	Diameter and thickness of cooling tube.	
	4)	Whether calculation sheet for selecting cooling	

		area to ensure that the transformer is capable	
		of giving continuous rated output without	
		exceeding temperature rise is enclosed.	
26	Inter layer insulation provided in design for:		
	1)	Top and bottom layer	
	2)	In between all layer	
	3)	Details of end insulation.	
	4)	Whether wedges are provided at 50ºC turns of the HV coil.	
27	Insulation materials provided.		
	a)	For Conductors	
		1 HV	
		2 LV	
	b)	For Core.	
28	Material and Size of the wire used.		
		HV	
		Dia (mm)	
		Number of conductors in	
		Total cross sectional area	
		LV	
		Dia (mm)	
		Number of conductors in	
		Total cross sectional area	
29	Whether the name plate gives all particulars as required in		
30	Particulars of bushings HV/LV		
	1)	Maker’s name	
	2)	Type IS-3347/IS-2099/IS-7421	

	3)	Rating as per IS	
	4)	Dry power frequency voltage withstand test	
	5)	Wet power frequency voltage withstand test.	
Note:			
The following shall be specifically confirmed:			
1)	Whether the offer conforms to the limits of impedance mentioned in the specification.		
2)	Whether the offer conforms to the limits of temperature rise mentioned in the specification.		
3)	Whether the losses of the transformers offered are within the limits specified.		
4)	Whether the transformer offered is already type tested for the design and test reports enclosed.		

Sl. No.	Description	To be specified by Bidders
1	Core Grade	
2	Core diameter(mm)	
3	Gross core area(Sq cm)	
4	Net core area(Sq cm)	
5	Flux density(Tesla)	
6	Mass of core(Kg)	
7	Loss per kg of core at the specified flux density(watt)	

8	Core window height(mm)	
9	Center to enter distance of the	
10	No.of LV Turns	
11	No.of HV turns	
12	Size of LV conductor bare/covered (mm)	
13	Size o HV conductor bare/covered (mm)	
14	No. of parallels	
15	Current density of LV winding.(A/sq mm)	
16	Current density of HV winding.(A/sq mm)	
17	Wt. of the LV winding for Transformer (kg)	
18	Wt. of the HV winding for Transformer (Kg)	
19	No. of LV Coils/phase	
20	No. of HV Coils/phase	
21	Height of LV Winding.(mm)	
22	Height of HV Winding.(mm)	
23	ID/OD of HV winding(mm)	
24	ID/OD of LV winding(mm)	
25	Size of the duct in LV winding(mm)	

26	Size of the duct in HV winding(mm)	
27	Size of the duct between HV and LV(mm)	
28	HV winding to LV winding	
29	HV winding to tank clearance(mm)	
30	Calculated impedance(%)	
31	HV to earth creepage distance(mm)	
32	LV to earth creepage distance(mm)	

GTP NO - 11 GUARANTEED TECHNICAL PARTICULARS of Transformer OIL			
SL. NO.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Appearance	Clear and transparent free from suspended matter or sediments.	
2	Density at 29.5° C (Max) gm/cc	0.89	
3	Viscosity, Kinematic at 27° C (Max)	27	
4	Interfacial Tension at 27° C (Min) Newton / M	0.04	
5	Flash point, Pensky Marten (closed) in °C (min).	140	
6	Pour point in ° C (Max)	-6	
7	Neutralisation value		
	a) Total acidity, mg KOH/gm (Max)	0.03	
	b) Inorganic acidity / alkalinity	Nil	
8	Corrosive sulphur (Copper strip) 19 hours at 140°C	Non corrosive	
9	Electric strength (Breakdown Voltage) KV (rms).		
	a) New unfiltered oil (min).	60	
	b) After filteration (min).	60	
10	Dielectric dissipation factor (Tan Delta) at 90°C (Max).	0.002	

11	Specific resistance (resistivity)		
	a) at 90° C , ohm-cms (Min)	35 x 10^{12}	
	b) at 27° C , ohm-cms (Min)	1500 x 10^{12}	
12	Oxidation stability.		
	a) Neutralisation value, after Oxidation for 164 hours at 100°C mg KOH/gm (Max).	0.4	
	b) Total sludge, after 164 hours at 100°C wt. % (max).	0.1	
13	Ageing characteristics after accelerated Ageing (open beaker method with copper Catalyst) for 96 hours at 115°C		
	a) Specific resistance(resistivity)		
	i) at 27°C, ohm-cms (Min)	2.5 x 10^{12}	
	i) at 90°C, ohm-cms (Min)	0.2 x 10^{12}	
	b) Dielectric dissipation factor (Tan Delta) at 90°C, , ohm-cms (Min)	0.2	
	c)Total acidity, mg KOH/gm (max)	0.05	
	d) Total sludge value, Wt. % (max)	0.05	

14	Presence of oxidation inhibitor	The oil shall not contain anti oxidant additives.	
15	Water content, ppm (max)	20	
16	i) Proportion of classes of hydrocarbons in the crude oil including content of aromatic hydrocarbons.		
	ii) Details of barrel (Size, gauge inside/outside coating/weight of empty drum not less than 18 Kg.)		
	iii) List of equipments for testing of oil as per revised ISS		
	iv)Electric strength(breakdown voltage) KV (Min)		
	a) Value of the fresh sample in the supplied sealed drums KV(Min).		
	b) Value after filling in transformer upto & within 3 months (Min)		

GTP NO-12 GUARANTEED TECHNICAL PARTICULARS FOR 33kV , 200 AMP, 3 POLE, H.G. FUSE			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Maker's name and country or origin	To be specified by the tenderder.	
2	Suitable for mounting	Horizontal only.	
3	Number of supporting post insulator per phase	4 nos. 22KV/24KV Post Insulator per phase as per ISS - 2544/ 1973	
4	Post Insulator		
(a)	Maker's name and country or orgin	To be specified by the tenderder.	
(b)	Type of cemeting	To be quoted original cemented only.	
(c)	One minute power frequency withstand voltage dry	80 KV RMS	
(d)	One minute power frequency withstand voltage wet.	70 KV RMS.	
(e)	Visible discharge voltage	27 KV RMS	
(f)	Dry Flashover Voltage	To be specified by the tenderder.	
(g)	Power frequency puncture withstand voltage	1.3 times of actual dry flash over voltage.	
(h)	Impulse withstand voltage(Switching Position)	170KV (peak)	
(I)	Creepage distance	380mm minimum. (actual creepage distance for which type test have been conducted is to be specified by the bidder)	
5	Impulse withstand voltage for positive and negative polarity (1.2/50 micro second wave)		
(a)	Across the isolating distance	195 KV (peak)	
(b)	To earth & between poles	170 KV (peak)	

6	One minute power frequency withstand voltage		
(a)	Across the isolating distance	80 KV (RMS)	
(b)	To earth & between poles	70 KV (RMS)	
7	Rated normal current and rated frequency.	200 amps, 50 Hz , 3 Pole	
8	Operating Voltage	33 KV	
9	Vertical clearance from top of insulator cap to mounting Channel	508 mm (minimum)	
10	Height of the riser for carrying the horns.	250mm from the cap (top) of insulator.	
11	Details of Arcing Horns	Copper rod having 8.32 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper casting. (Total length 995mm). All the bolts, nuts and washers should be made out of brass.	
12	Riser Unit (250mm total height).	(a) The shape of connectors may be made of straight copper Flat of	
		(b) 170mm height G.I. Riser made of 25mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 35 x 5 mm at both ends fixed with 10mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13	Supporting Channels	100 x 50 x 6 mm M.S. Channel (galvanized)	
14	Galvanisation	All ferrous parts should be galvanized as per IS-2633/1 972 & all non-ferrous part should be duly electroplated with silver.	
15	Weight of each pole (complete)	To be specified by the tenderder.	

GTP NO-13 GUARANTEED TECHNICAL PARTICULARS FOR 11kV 200 AMP, 3 POLE, H.G. FUSE .			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Maker's name and country or origin		
2	Suitable for mounting	Horizontal only.	
3	Number of supporting post insulator per phase	2 nos. 12KV Post Insulator per phase as per ISS -2544/ 1973	
4	Post Insulator		
(a)	Maker's name and country or orgin	To be specified by the tenderer.	
(b)	Type of cementing	To be quoted original cemented only.	
(c)	One minute power frequency withstand voltage dry	28 KV RMS	
(d)	One minute power frequency withstand voltage wet.	28 KV RMS	

(e)	Visible discharge voltage	9KV RMS	
(f)	Dry Flashover Voltage	To be specified by the tenderer.	
(g)	Power frequency puncture withstand voltage	1.3 times of actual dry flash over voltage.	
(h)	Impulse withstand voltage(Switching Position)	75KV (peak)	
(I)	Creepage distance	380mm minimum. (actual creepage distance for which type test have been conducted is to be specified by the bidder)	
5	Impulse withstand voltage for positive and negative polarity (1.2/50 micro second wave)		
(a)	Across the isolating distance	85KV (peak)	
(b)	To earth & between poles	75 KV (peak)	
6	One minute power frequency withstand voltage		
(a)	Across the isolating distance	32 KV (RMS)	
(b)	To earth & between poles	28 KV (RMS)	

7	Rated normal current and rated frequency.	200 amps, 50 Hz , 3 Pole	
8	Operating Voltage	11 KV	
9	Vertical clearance from top of insulator cap to mounting Channel	254 mm (minimum)	
10	Height of the riser for carrying the horns.	150mm from the cap (top) of insulator.	
11	Details of Arcing Horns	Copper rod having 7.62 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper casting. (Total length 635mm). All the bolts, nuts and washers should be made out of brass.	

12	Riser Unit (250mm total height).	(a) The shape of connectors may be made of straight copper Flat of size adequate enough to carry a current density not less than 1.5 Amp/ mm^2. 2 Nos of 3/8" G.I. Bolts, double nuts, plain and spring washers and 2 nos. solder less bimetallic shockets per each connector suitable up to 100 mm^2 AAA conductor.	
		(b) 100mm height G.I. Riser made of 19mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 30 x 5 mm at both ends fixed with 10mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13	Supporting Channels	75 x 40 x 6 mm M.S. Channel (galvanized)	
14	Galvanisation	All ferrous parts should be galvanized as per IS-2633/1972 & all non-ferrous part should be duly electroplated with silver.	
15	Weight of each pole (complete)	To be specified by the tenderer.	

GTP NO- 14 GURANTEED TECHNICAL PARTICULARS OF ISOLATOR(33kV)			
Sl.No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Main switch	Double end break Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operator	
5	Rated voltage nominal/ Maximum	33/36 kV	
6	Rated Frequency	50 Hz (+5% to -3%)	
7	System earthing	Effectively earthed	
8	Temperature rise	As per relevant IS/IEC publication	
9	Insulation level impulse with stand voltage		
	a) Across Isolating distance	195 kVpeak	

	b) To earth & between poles	170 kVpeak	
10	1 minute power frequency withstand voltage		
	a) Across Isolating distance	80 kVpeak	
	b) To earth & between poles	70 kVpeak	
11	Rated current in Amp	1250	
12	Short time current for 3 sec	25kA	
13	Operating mechanism	Motorised	
14	Auxiliary voltage	33kV	
	a) Control & Inter lock	48 DC 80% to 110%	
15	Safe duration of overload		

	a)150% of rated current	5 minute	
	b)120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	900mm	
	i) Mounting structure	Upright on G.I structure	
	ii) Terminal connector type	Bimetallic clamp	
	iii) Control	Local	

GTP NO- 15	GURANTEED TECHNICAL PARTICULARS OF ISOLATOR(11kV)		
Sl.No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Main switch	Double end break Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operated	
5	Rated voltage nominal/ Maximum	11/12 kV	
6	Rated Frequency	50 Hz (+5% to -3%)	
7	System earthing	Effectively earthed	
8	Temperature rise	As per relevant IS/IEC publication	
9	Insulation level impulse with stand voltage		

	a) Across Isolating distance	85 kV peak	
	b) To earth & between poles	75 kVpeak	
10	1 minute power frequency withstand voltage		
	a) Across Isolating distance	32 kVpeak	
	b) To earth & between poles	28 kVpeak	
11	Rated current in Amp	1250	
12	Short time current for 3 sec	25kA	
13	Operating mechanism	Manual	
14	Auxiliary voltage	11kV	
	a) Control & Inter lock	48 DC 80% to 110%	

15	Safe duration of overload		
	a)150% of rated current	5 minute	
	b)120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	380 mm	
	i) Mounting structure	Upright on G.I structure	
	ii) Terminal connector type	Bimetallic clamp size	
	iii) Control	Local	

GTP NO-16 GUARANTEED TECHNICAL PARTICULARS FOR 33kV, 200A/400A, 50 Hz AB SWITCH, 3 POLE, SINGLE BREAK TYPE			
Sl. No	**Name of the Particulars**	**Desired value**	**Bidder's offer**
1	Maker's name and country of origin	To be specified by the tenderer	
2	Type of Switch	Rotating type only	
3	Suitable for mounting	Horizontal only	
4	Number of supporting Post Insulators per phase	4 nos.(22kV / 24kV Post Insulators per phase as per ISS-2544/1 973)	
5	Post Insulator.		
a)	Maker's name and country of origin	To be specified by the tenderer	
c)	Type of cementing	To be quoted for original cemented only & as per IS-2544-1 973 & relevant IEC.	

d)	One minute power frequency withstand voltage Dry	95kV rms.	
e)	One minute power frequency withstand voltage Wet	75kV rms.	
f)	Visible discharge voltage	27kV rms.	
g)	Dry Flash Over Voltage	125 kV	
g)	Power frequency puncture with stand voltage	1.3 times of actual dry flash over voltage	
h)	Impulse withstand voltage (switch in position)	170kV(peak)	
i)	Creepage distance (mm)	380mm minimum. (actual Creepage distance for which type test have been conducted is to be specified by the tenderer)	

6	Impulse withstand voltage for positive and negative polarity 1.2 / 50 mircro-second wave		
a)	Across the isolating distance	195kV(peak)	
b)	To earth & between poles	170kV(peak)	
7	One minute power frequency withstand voltage		
a)	Across the isolating distance	80kV(rms)	
b)	To earth & between poles	70kV(rms)	
8	Rated normal current and rated frequency	200 Amp/ 400 Amp 50 Hz	
9	Rated short time current. for 3 sec	25kA (rms)	
10	Rated short circuit making capacity	62.5kA (rms)	

11	Rated peak withstand current	40kA(Peak)	
12	Rated cable charging breaking capacity	16A (rms)	
13	Rated Transformer off load breaking capacity	16 Amp(rms)	
14	Rated line charging breaking capacity	16Amp(rms)	
15	Minimum clearance between adjacent phases		
a)	Switch Closed (centre to centre)	1200 mm	
b)	Switch Opened (centre to edge of blade)	640 mm	
16	Temperature rise		

a)	Temperature rise shall not exceed the maximum limit as specified below at an ambient temperature not exceeding in	40° C	
b)	Copper contacts in air	65^0C	
c)	Terminal of switch intended to be connected to external conductor by bolts	50^0C	
17	Vertical Clearance from top of insulator cap to mounting channel	508 mm (minimum)	
18	Type of Contact: -	a) Self aligned, high pressure jaw type fixed contacts of electrolytic copper of size 80 mm x 50 mm x 8 mm duly silver plated. Each contact should be revetted with three nos. Copper rivets with a bunch (minimum 3 mm thick) consisting of copper foils, each may vary from 0.15 mm to 0.25 mm. These total thickness of copper foils per jaw should be 6 mm. Jaw assemblies are to be bolted through stainless steel bolts and nuts with stainless steel flat and spring washer.	
		b) Solid rectangular blade type moving contact of electrolytic copper size 250 mm x 50 mm x 8 mm duly silver plated ensuring a minimum deposit of 10 micron of silver on copper contacts or as may be prescribed under relevant ISS / IEC.	

		c) Pressure spring to be used in jaw contacts shall be Stainless Steel having 8 nos of turn x 28 mm height x 14.4 mm diameter with 14 SWG wire (minimum six nos springs shall be used)	
19	Connectors:-	Terminal connectors for both movable and fixed should be of copper flats of same size similar to that of moving contact blades (minimum 95% copper composition). The fixed connector shall of size 80 mm x 50 x 8 mm and the size of movable connector shall be size 80 x 50 x 8 mm with machine finishing duly silver plated with 2 nos. of 3/8" stainless steel bolts, nuts, plain washers & spring washers should be provided along with 2 nos solder less bimetallic sockets for each connector suitable sockets for each connector suitable up to 232 mm^2 AAA Conductor.	
20	Moving Contacts:-	Movable contact is to be supported by galvanized angle of 50 x 50 x 5 mm in each phase and the moving contact are to be bolted through 2 no stainless steel bolts and nuts with suitable stainless steel flat and spring washers.	
21	Galvanization	a) Iron parts shall be dip galvanized as per IS- 2633/1972.	
		b) The pipe shall be galvanized as per 4736/1968.	
22	Details of Phase		
a)	Coupling Rod	25 mm nominal bore G.I. pipe medium gauge.	

b)	Operating Rod	32 mm nominal bore G.I. pipe medium gauge single length 6 mtrs. The detailed dimension of the G. I. pipe as per IS-1239 (Pt. I) as mentioned					
		Nominal base (mm)	Outside diameter (mm)	Diameter thickness (mm)	base Nominal (mm)	Outside diameter (mm)	Diameter thickness (mm)
			Max	Min	Max	Min	
		25	34.2	3.25			
		32	42.9	3.25			
c)	Arcing Horns	10 mm dia G.I. rod with spring assisted operation.					
d)	Force of Fixed contact spring	To be specified by the tenderer.					
e)	Copper braided flexible tapes:-	450 mm length of flexible electrolytic copper tape or braided chord (with tin coated) having minimum weight 450 gms per meter and both ends shall be					
f)	Quick break device	Lever mechanism.					
g)	Bearings	4 nos. self lubricated bearing to be provided with grease nipple including 4th bearing being a thrust bearing.					

h)	Locking arrangement	Pad Lock & Key arrangement at both 'ON' & 'OFF' position	
i)	Earth Terminal:	To be provided at base channels.	
23	Supporting Channels	100 mm x 50 mm M.S. Channel hot galvanized.	
24	Weight of each pole complete	To be specified by the tender	

GTP NO-17 GUARANTEED TECHNICAL PARTICULARS FOR 11kV, 200A, 50 Hz AB SWITCH, 3 POLE, SINGLE BREAK TYPE BRAKE TYPE			
Sl. No	**Name of the Particulars**	**Desired value**	**Bidder's offer**
1	Maker's name and country of origin	To be specified by the tenderer	
2	Type of Switch	Rotating type only	
3	Suitable for mounting	Horizontal only	
4	Number of supporting Post Insulators per phase	2 nos. (12 kV Post Insulators per phase as per ISS-2544/1973)	
5	Post Insulator.		
a)	Maker's name and country of origin	To be specified by the tenderer	
b)	Type of cementing	To be quoted for original cemented only & as per IS-2544-1973 & relevant IEC.	
c)	One minute power frequency withstand voltage Dry	35kV rms.	

d)	One minute power frequency withstand voltage Wet	35kV rms.	
e)	Visible discharge voltage	9kV rms.	
f)	Dry Flash Over Voltage	55 kV	
g)	Power frequency puncture with stand voltage	1.3 times of actual dry flash over voltage	
h)	Impulse withstand voltage (switch in position)		
i)	Creepage distance (mm)	330 mm minimum. (actual Creepage distance for which type test have been conducted is to be specified by the tenderer)	
6	Impulse withstand voltage for positive and negative polarity 1.2 / 50 mircro-second wave		
a)	Across the isolating distance	85kV(peak)	
b)	To earth & between poles	75kV(peak)	

7	One minute power frequency withstand voltage		
a)	Across the isolating distance	32kV(rms)	
b)	To earth & between poles	28kV(rms)	
8	Rated normal current and rated frequency	200 Amp 50 Hz	
9	Rated short time current.	16kA(rms)	
10	Rated short circuit making capacity	25kA(rms)	
11	Rated peak withstand current	40kA(Peak)	
12	Rated cable charging breaking capacity	10kA(rms)	

13	Rated Transformer off load breaking capacity	6.3 Amp(rms)	
14	Rated line charging breaking capacity	2.5 Amp(rms)	
15	Minimum clearance between adjacent phases		
a)	Switch Closed (centre to centre)	760 mm	
b)	Switch Opened (centre to edge of blade)	380 mm	
16	Temperature rise		
a)	Temperature rise shall not exceed the maximum limit as specified below at an ambient temperature not exceeding in	40^0C	
b)	Copper contacts in Silver Plated	65^0C	

c)	Terminal of switch intended to be connected to external conductor by bolts	50^0C	
17	Vertical Clearance from top of insulator cap to mounting channel	254 mm (minimum)	
18	Type of Contact: -	a) Self aligned, high pressure jaw type fixed contacts of electrolytic copper of size 80 mm x 50 mm x 8 mm duly silver plated. Each contact should be revetted with three nos. Copper rivets with a bunch (minimum 3 mm thick) consisting of copper foils, each may vary from 0.15 mm to 0.25 mm. These total thickness of copper foils per jaw should be 6 mm. Jaw assemblies are to be bolted through stainless steel bolts and nuts with stainless steel flat and spring washer.	
		b) Solid rectangular blade type moving contact electrolytic copper size 220 mm x 50 mm x 8 mm duly silver plated ensuring a minimum deposit of 10 micron of silver on copper contacts or as may be prescribed under relevant ISS / IEC.	
		c) Pressure spring to be used in jaw contacts shall be Stainless Steel having 8 nos of turn x 28 mm height x 14.4 mm diameter with 14 SWG wire (minimum six nos springs shall be used)	

19	Connectors:-	Terminal connectors for both movable and fixed should be of copper flats of same size similar to that of moving contact blades (minimum 95% copper composition). The fixed connector shall of size 80 mm x 50mm x 8 mm and the size of movable connector shall be size (80 x 50) x(80x50)x 8 mm with machine finishing duly silver plated with 2 nos. of 12mm dia. hole with suitable brass & double nuts with brass flat washers and 2nos solderlss bimetallic sockets per each connector suitable 80 mm^2 AAA Conductor.	
20	Moving Contacts:-	Movable contact is to be supported by galvanized angle of 50 x 50 x 5 mm in each phase and the moving contact are to be bolted through 2 no stainless steel bolts and nuts with suitable stainless steel flat and spring washers.	
21	Galvanization	a) Iron parts shall be dip galvanized as per IS-2633/1972.	
		b) The pipe shall be galvanized as per IS-4736/1 968.	
22	Details of Phase		

a)	Coupling Rod	25 mm nominal bore G.I. pipe medium gauge.	
b)	Operating Rod	32 mm nominal bore G.I. pipe medium gauge single length 6 mtrs. The detailed dimension of the G. I. pipe as per IS-1 239 (Pt. I) as mentioned below :-	
c)	Arcing Horns	8 mm dia G.I. rod with spring assisted operation.	
d)	Force of Fixed contact spring	To be specified by the tenderer.	
e)	Copper braided flexible tapes:-	320 mm length of flexible electrolytic copper tape or braided chord (with tin coated) having minimum weight 450 gms per meter and both ends shall be crimped with copper sockets through brass bolts and nuts with brass flat washers. Two nos of suitable copper sockets shall be used at both ends. The minimum no. of flexible wires should be 1536 of 36 SWG for each flexible chord.	
f)	Quick break device	Lever mechanism.	

g)	Bearings	4 nos. self lubricated bearing to be provided with grease nipple including 4th bearing being a thrust bearing.			
h)	Locking arrangement	Pad Lock & Key arrangement at both ‘ON’ & ‘OFF’ position.			
i)	Earth Terminal:	To be provided at base channels.			
j)	T connection	The T connection provided on the channel having moving contact shall be of G.I Nut & bolt at the bottom end to facilitate replacement of this unit only during requirements & avoid entire change of the arm			
k)	I Bolt	The I bolt shall be longer with 75mm thread			
23	Supporting Channels	100 mm x 50 mm M.S. Channel hot dip galvanized.			
24	Weight of each pole complete	To be specified by the tender			

GTP NO-18 GUARANTEED TECHNICAL PARTICULARS FOR 100 mm2 AAAC			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's offer**
1	Make		
2	No. of strands	7	
3	Wire dia in mm.:		
a)	Nominal	4.26	
b)	Minimum	4.22	
c)	Maximum	4.3	
4	Approximate overall dia of the conductor in mm. Cross-sectional area of:	12.78	
5.a)	Individual wire in mm^2	14.25	
b)	Stranded conductor in mm^2	99.81	
6.a)	Approx Mass of :		
b)	Individual wire in Kg/Km	38.48	

c)	Stranded Conductor in Kg/Km	272.86	
7.a)	Minimum breaking load in KN		
b)	Individual wire	4.18	
c)	Conductor (U.T.S.)	29.26	
8.a)	Calculated maximum DC resistance at 20 ^{0}C in Ohm/ Km		
b)	Individual wire	2.345	
c)	Conductor	0.339	
9	Lay ratio for 7 wire conductor	Min : 10, Maxm : 14	
10	Direction of Lay	Right handed	

11	Modulus of Elasticity (Kg/ cm^2)	0.6324×10^6	
12	Co-efficient of linear expansion per ^{0} C	23.0×10^{-6}	
13	Standard length (Mtr.)	2000 ± 5%	
14	Size of drum in mm.		
15	No. of lengths in one drum		
16	No. of cold pressure butt welding		

GTP NO-19 GUARANTEED TECHNICAL PARTICULARS FOR 148 mm2 AAAC			
Sl.No	**Name of the Particulars**	**Desired Value**	**Bidder's offer**
1	Make		
2	No. of strands	7	
3	Wire dia in mm.:		
a)	Nominal	3.15	
b)	Minimum	3.12	
c)	Maximum	3.18	
4	Approximate overall dia of the conductor in mm. Cross-sectional area of:	15.75	
5.a)	Individual wire in mm^2	7.793	
b)	Stranded conductor in mm^2	148	
6.a)	Approx Mass of :		
b)	Individual wire in Kg/Km	21.04	
c)	Stranded Conductor in Kg/Km	406.91	
7.a)	Minimum breaking load in KN		
b)	Individual wire	2.289	
c)	Conductor (U.T.S.)	43.5	
8.a)	Calculated maximum DC resistance at 20 ^{0}C in Ohm/ Km		
b)	Individual wire	4.351	
c)	Conductor	0.229	
9	Lay ratio for 7 wire conductor	Min : 10, Maxm : 16	
10	Direction of Lay	Right handed	
11	Modulus of Elasticity (Kg/ cm^2)	0.6324 x 106	

12	Co-efficient of linear expansion per ^{0} C	23.0 x 10 -6	
13	Standard length (Mtr.)	2000 ± 5%	
14	Size of drum in mm.	To be offered by the bidder	
15	No. of lengths in one drum	To be offered by the bidder	
16	No. of cold pressure butt welding		

GTP NO-20 Guaranteed Technical Particulars of 33kV INSULATOR PIN TYPE			
Sl No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Type	Confirming to IEC 273 (solid core)	
3	Voltage class (kV)	36	
4	Dry and wet one minute withstand voltage (kV rms)	70	
5	Dry lightning impulse withstand voltage (kV p)	170	
6	Wet switching surge withstand voltage (kV p)	NA	
7	Max. RIV at corona extinction voltage (micro volts)	NA	
8	Corona extinction voltage (kV rms)		
9	Total minimum cantilever strength (kg)	Not < 300	
10	Minimum torsion moment	As per IEC 273	

11	Total height of insulator (mm)	508	
12	Minimum PCD (mm) top/bottom	76	
13	No. of bolts top/bottom	04- 08	
14	Diameter of Bolts Hole (mm) top /Bottom	M12	
15	Pollution level as per IEC 815	Heavy/Moderately polluted	
16	Minimum total creepage distance (mm)	840 mm in coastal districts and industrial polluted area as detailed in the technical specification and 580 mm in other areas	

GTP NO- 21 Guaranteed Technical Particulars of 11kV INSULATOR PIN TYPE			
Sl No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Type	Confirming to IEC 273 (solid core)	
3	Voltage class (kV)	12	
4	Dry and wet one minute withstand voltage (kV rms)	28	
5	Dry lightning impulse withstand voltage (kV p)	75	
6	Wet switching surge withstand voltage (kV p)	NA	
7	Max. RIV at corona extinction voltage (micro volts)	NA	
8	Corona extinction voltage (kV rms)		
9	Total minimum cantilever strength (kg)	Not < 300	
10	Minimum torsion moment	As per IEC 273	
11	Total height of insulator (mm)	254	
12	Minimum PCD (mm) top/bottom	57	
13	No. of bolts top/bottom	04- 08	
14	Diameter of Bolt holes (mm) top/ Bottom	M12	
15	Pollution level as per IEC 815	Heavy	
16	Minimum total creepage distance (mm)	300	

GTP NO-22 GUARENTEED TECHNICAL PARTICULARS FOR METAL OXIDE (GAPLESS) 33kV SURGE ARRESTERS			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Nominal system voltage (phase to phase) (KV rms).	33	
3.a)	Highest system voltage (phase to phase) (KV rms).	36	
4	System Frequency (HZ).	50 ±5%	
5	System Neutral earthing.	Effectively earthed	
6	Installation.	Outdoor	
7	Class.	Station class, 10 KA, heavy duty type.	
8	Type of construction for 10 KA rated arrester.	Single column, single phase	
9	No. of phases.	Three	
10	Maximum duration of earth fault (Sec.)	3	
11	Maximum prospective symmetrical fault current at arrester location	40	
12	Rated arrester voltage (KV rms)	30	
1 3.a)	Nominal discharge current (KAP)	10 KA of 8/20 µsec Wave.	

	b) Discharge current at which insulation co-ordination will be done		
14	Minimum energy discharge capability (KJ/KV)	As per relevant ISS/IEC	
15	Maximum continuous operating voltage at 50º C (KV rms)	25	
16	Maximum switching surge residual voltage (KVP)	72 at 500A	
17	Maximum residual voltage at 8/20 micro second(KVP)		
(i)	5KA.	85	
(ii)	10 KA Nominal discharge current.	90	
(iii)	20 KA.	100	
18	Long duration discharge class	3	
19	High current short duration test value (KAP) (4/10 Micro-second wave).	100	
20	Current for pressure relief test (KA-rms)	40	
21	Minimum total creepage distance (mm).	900	
22	One minute dry and wet power frequency withstand voltage of Arrester housing (KV-rms).	70	

23 (a)	Impulse withstand voltage of arrester housing with 1.2/ 50 micro-second wave (KVP).	110.5	
b)	Switching Impulse Voltage (Wet) (KVP)		
24	Pressure relief class.	A	
25	Corona extinction voltage (KV-rms).	-	
26	RIV at 92 KV rms.	Less than 500 micro volts	
27	Partial discharge at 1.05 times continuous over-voltage.	Nor more than 50 PC	
28	Seismic acceleration.	0.3g horizontal 0.15g vertical	
29	Reference ambient temperature.	50ºC	
30.(a)	IR at MCOV.	Less than 400 micro amperes	
b)	IC at MCOV.	Less than 1200 micro amperes	
31.a)	Reference Current (mA)	1 to 5 mA	
b)	Reference voltage at reference current.	Greater than rated voltage.	

32	Maximum steep current Impulse RDV (KVP). at KAP	100	
33	Maximum cantilever strength of the arresters (KGM).	325	
34	TOV(KVP).		
(i)	0.1 sec.	53	
(ii)	1.0 sec.	51	
(iii)	10.0 sec.	49	
(iv)	100.0 sec.	47	

GTP NO-23 Guaranteed Technical Particulars Of 11 kV Surge Arrestors			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Nominal system voltage (phase to phase) (KV rms).	11	
3	Highest system voltage (phase to phase) (KV rms).	12	
4	System Frequency (HZ).	50 (+5% to -3%)	
5	System Neutral earthing.	Effectively earthed	
6	Installation.	Outdoor	
7	Class.	5 KA.	
8	Type of construction for 5 KA rated arrester.	Single column, single phase	
9	No. of phases.	Three	
10	Maximum duration of earth fault (Sec.)	3	
11	Maximum prospective symmetrical fault current at arrester location (KA rms)	40	
12	Rated arrester voltage (KV rms)	9	
13	Nominal discharge current (KAP)	5 KA of 8/20 µsec Wave.	
14	Minimum energy discharge capability (KJ/KV)	As per relevant ISS/IEC	
15	Maximum continuous operating voltage at 50º C (KV rms)	9.6	
16	Maximum switching surge residual voltage (KVP)	28	
17	Maximum residual voltage at 8/20 micro second(KVP)		

(i)	5 KA.	32	
18	High current short duration test value (KAP) (4/10 Micro-second wave).	100	
19	Current for pressure relief test (KA-rms)	40	
20	Minimum total creepage distance (mm).	380	
21	One minute dry and wet power frequency withstand voltage of Arrester housing (KV-rms).	28	
22	Impulse withstand voltage of arrester housing with 1.2/ 50 micro-second wave (KVP).Switching Impulse Voltage (Wet) (KVP)	41.6	
23	Pressure relief class.	A	
24	Corona extinction voltage (KV-rms).	-	
25	RIV at 92 KV rms.	Less than 500 micro volts	
26	Partial discharge at 1.05 times continuous over voltage.	Not more than 50 PC	
27	Seismic acceleration.	0.3g horizontal 0.15g vertical	
28	Reference ambient temperature.	50ºC	
29. (a)	IR at MCOV.	Less than 400 micro amperes	

(b)	IC at MCOV.	Less than 1200 micro amperes	
30. (a)	Reference Current (mA)	1 to 5 mA	
(b)	Reference voltage at reference current.	Greater than rated voltage.	
31	Maximum steep current Impulse RDV (KVP). at KAP	100	
32	Maximum cantilever strength of the arresters (KGM).	325	
33	TOV (KVP).		
(i)	0.1 sec.	20	
(ii)	1.0 sec.	18	
(iii)	10.0 sec.	16	
(iv)	100.0 sec.	14	

GTP NO – 24 GUARANTEED TECHNICAL PARTICULARS FOR NUMERICAL RELAY			
Sl No	**Name of the Particulars**		**Bidder's Offer**
1	Manufacturer's Name and country of origin		
2	Manufacturer's design Ref / Type		
3	Applicable Standards		
4	Current setting range for		
	(a)Over current relay	IDMTL Instantaneous	
	(b)Earth-fault relay	IDMTL Instantaneous	
	(c)Contact Rating		
5	Details on IDMTL characteristics		
6	Whether High Set is Transient free		
7	Whether separate Time setting for IDMTL / Instantaneous Elements available		
8	Whether Relay senses True RMS Current		
9	Accuracy for different settings and limits of errors		
10	Whether settings site selectable and HMI provided		
11	Whether Alpha Numeric LED display		
12	Whether Compatible for 48 V DC		

13	Whether Compatible for 1 A CT Secondary	
14	Whether Self diagnostic features available	
15	Whether Communication IEC 61850	
16	Whether Blocking characteristics available for blocking the unscrupulous tripping of Upstream Breakers	
17	(a)Whether relay test block is provided	
	(b)Type of test block with literature	
18	Whether draw out type unit	
19	Types of case	
20	Reset time	
21	Burden of relay	

GTP NO-25 GUARANTEED TECHNICAL PARTICULARS FOR 33/0.11 kV INDUCTIVE VOLTAGE TRANSFORMERS			
Sl. No	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
1 2	Type Nominal system voltage.	Singlephase,50Hz,oil filled, self cooled, Hermetically sealed, outdoor porcelain type 33KV.	
3	Highest system voltage.	36KV	
4	Frequency.		
5	System earthing.	Effectively solidly earthed	
6	Number of phases.	3 [single phase]	
7	(i)Number of secondary windings. (ii)Purpose of windings.	2 (two) one protection and one Metering)	
8	Rated primary voltage.	33/1.732KV	

9	Rated secondary voltage.	110/1.732V (Metering) 110/1.732V Protection	
10	Ratio	33KV/1 .732/ 110/1 .732	
11	Rated burden.	Winding-I(P)- 15VA Winding-II(M)- 15 VA	
12	Accuracy class .	3P & 0.2	
13	Rated voltage factor at rated frequency.	1.2 continuous. 1.5 for 30 seconds	
14	Temperature rise at 1.2 times the rated primary voltage, rated frequency & rated	As per IEC-186.	
15	Temperature rise at 1.5 times the ratedprimary voltagefor 30seconds, rated frequency &rated	As per IEC-186	
16	One-minute power frequency dry withstands test voltage for primary winding.	70KV (rms)	
17	1-minute power frequency wet withstands test voltage for primary winding.	70KV (rms)	

18	1.2/50 microsecond impulse withstandtest voltage for primary winding	170KV (peak)	
20	One-minute power frequency withstands test voltage for Secondary winding Between LV(HF) terminal & earth terminal Class of insulation.	3 KV (rms) 'A'	
21	Material of the conductor of primary and secondary windings.	Copper	
22	Fault level of the bus to which PTs will be connected.	25KA for 3 second.	
23	Minimum creepage distance.	900mm	
24	Quality of oil.	EHV Grade As per IS-335	
25	Radio interference voltage at 1.1 times maximum rated voltage at 1.0 MHZ.	Less than 500 micro volts	
26	Partial discharge level.	Nor more than 50 PC	

27	Seismic acceleration- Horizontal – Vertical.	0.3g. 0.15g.	
28	Accuracy class of standard V.T. to be used during testing towards determination of ratio errors and phase angle errors for metering windings.	0.05 or better.	
29	Capacitance (Pf)	-	

GTP NO-26 GUARANTEED TECHNICAL PARTICULARS FOR 11/0.11 kV INDUCTIVE VOLTAGE TRANSFORMERS			
Sl. No	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
1	Type	Singlephase,50Hz,oil filled, self cooled, Hermeticallysealed, outdoor porcelain type	
2	Nominal system voltage.	11KV.	
3	Highest system voltage.	12 KV	
4	Frequency.		
5	System earthing.	Effectively solidly earthed	
6	Number of phases.	3 [single phase]	
7	(i)Number of secondary windings.	2 (two) one protection and one Metering)	
	(ii)Purpose of windings.		
8	Rated primary voltage.	11/1.732KV	
9	Rated secondary voltage.	110/1.732V (Metering)	
		110/1 .732V	
		Protection	

10	Ratio	11KV/1 .732/ 110/1 .732	
11	Rated burden.	Winding-I(P)-15VA Winding-II(M)- 15VA	
12	Accuracy class .	3P and 0.2	
13	Rated voltage factor at rated frequency.	1.2 continuous. 1.5 for 30 seconds	
14	Temperaturerise at 1.2 times the rated primary voltage, rated frequency & rated burdens.	As per IEC-186.	
15	Temperature riseat 1.5 timesthe ratedprimary voltagefor 30seconds, rated frequency &rated	As per IEC-186	
16	One-minute power frequency dry withstands test voltage for primary winding.	28KV (rms)	
17	1.2/50 microsecond impulse withstandtest voltage for primary winding	75KV (peak)	

18	One-minute power frequency withstands test voltage for Secondary winding	3 KV (rms)	
(i)	Between LV(HF) terminal & earth terminal	3 KV (rms)	
20	Class of insulation.	'A'	
21	Material of the conductor of primary and secondary windings.	Copper	
22	Fault level of the bus to which PTs will be connected.	25KA for 3 second	
23	Minimum creepage distance.	320mm	
24	Quality of oil.	EHV Grade	
		As per IS-335	
25	Radio interference voltage at 1.1 times maximum rated voltage at 1.0 MHZ.	Less than 500 micro volt	
26	Partial discharge level.	Not more than 50 PC	
27	Seismic acceleration- Horizontal – Vertical.	0.3g.	
		0.15g.	

28	Accuracy class of standard V.T. to be used during testing towards determination of ratio errors and phase angle errors for metering windings.	0.05 or better.	

GTP NO 27 GURANTEED TECHNICAL PARTICULARS OF 33 KV & 11 kV V-CROSS ARM				
Sl. No.	**Name of the Particulars**	**Unit**	**33kV**	**11kV**
1	Type of crossarm			
2	Grade of steel			
3	Steel standard			
4	Fabrication Standard			
5	Dimensions	Mm		
6	Steel section utilized			
7	Steel tensile strength	N/cm^2		
8	Working load	Kg		
9	Details of Galvanising Methods utilized and Standard/Specification			
10	Weight of cross arm	kg		
11	Whether drawing has been submitted with the bid			

GTP NO- 28	GURANTEED TECHNICAL PARTICULARS OF HT STAY SET				
Sl NO	**Name of the Particulars**	**Specified Parameters**			**Bidder's Offer**
		Section Tolerances	**Fabrication Tolerances**	**Material**	
1	Anchor Plate	8mm thick+2.5%-5%	300x300mm+1%	5 GI Plate 8 mm thick	
2	Anchor Rod	20mm dia +3%-2%	Length 1800mm +0.5% Round Eye 40mm inside dia + 3%. Threading 40mm =11 %-5%	GI Round 20mm dia	
3	Turn Buckle Bow	16mm dia +5%-3%	Length180mm +1% 50x50x6mm Channel length 200mm + 1%	GI Round 16mm dia. GI Angle GI Channel 100x50x4.7mm	
4	Eye Bolt Rod	20mm dia + 3% - 2%	Length450mm +1 %Threading 300mm +1% Round Eye 40 mm inside dia +3%	GI Round 20mm dia.	

GTP NO- 29 GURANTEED TECHNICAL PARTICULARS of STAY WIRE (7/10 SWG)			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Nominal diameter of wire	4.87m m	
2	Tolerance in diameter	+/- 2.50%	
3	Sectional Area (In Sq. mm.)	18.63	
4	Tensile strength	925kgf	
6	Type of coating Heavy/Medium/Light	Heavy	
8	Weight of Zinc coating (Gms/ Mtr.) Min.	3	
9	No. of dips the coating withstand as 18 ± 20ºC 1 min	3	

11	Tensile test : Tension strength in MPA	550 TO 900	
12	Ductility Test : Condition of wire after wrapping test as per ISS 175/1 961	When wrapped 8 times round its own diameter and on being straigthened the wire shall not split	
13	Lenghth of wire in each coil in meter	408	
13 a	Tolerance%	+/- 5%	
14	Weight of each coil in Kgs	70 to 100	
14 a	Tolerance%	+/- 5%	
15	Weight of wire in Kg/Km	146	
15 a	Tolerance%	+/- 5%	
16	Standard according to which the solid wire is manufactured and tested	ISS 280/78	
17	Details of packing	By G.I Wire	

GTP N0 -30 GURANTEED TECHNICAL PARTICULARS OF TENSION CLAMP			
Sl. No.	**Name of the Particulars**	**Desired Value (Suitable for AAAC 148/100mm^2)**	**Bidders Offer**
1	Type	Compression type tention clamp	
2	Material	Ext. Al.Alloy/Ext. Al.	
3	Breaking Strenght	95% of UTS of Conductor	
4	Slipping Strenght	95% of UTS of Conductor	
5	Galvanising		
a	Ferrous Parts	Hot Dip Galvanised	
b	Spring Washers	Electro Galvanised	
6	Quality of Zinc used	99.95 %	
7	Number of dips which the clamp can withstand	6/ 1 minute dips	
8	Standard to which Conforming	IS 2633	
9	Electrical conductivity		
a.	Results of heating cycle test carried out	T.C. Attached	
b.	Electrical resistance	Not more than 75% of equivalent length of conductor	
10	Reference to type tests and other test reports attached	T.C. Attached	
11	Make of bolts and Nuts used		

GTP N0 -31 GURANTEED TECHNICAL PARTICULARS OF SUSPENSION CLAMP			
Sl. No.	**Name of the Particulars**	**Desired Value (Suitable for AAAC 148/100mm^2)**	**Bidders Offer**
1	Type of material used for retaining rod for AGS assembly giving reference of ISS	Aluminum Alloy 6061/Equivalent	
2	Minimum tensile strength of retaining rod material	35 Kg/mm2	
3	Chemical composition of retaining rod materials	As per IS:733	
4	Electrical conductivity of Armour Rod material(In percentage of the conductivity of IACS i.e. International Annealed Copper Standard	Not less than 40 %of IACS	
5	Slipping strength of cushioned suspension assembly	8% to 15% of UTS of Conductor	
6	Breaking strength of suspension Clamp	6000 Kgf	
7	Minimum Tensile Strength	2000 Psi	
8	Minimum ultimate Elongation	300 %	
9	Ageing (guaranteed life of the assembly)	40 Years	
10	Hardness	65 to 80 A	

GTP N0 -32 GURANTEED TECHNICAL PARTICULARS OF BACK CLAMP			
Sl. No.	Name of the Particulars	Unit	Bidder's Offer
1	Type of Clamp		
2	Grade of steel		
3	Steel standard		
4	Fabrication Standard		
5	Dimensions	Mm	
6	Steel section utilized		
7	Steel tensile strength	N/cm^2	
8	Working load	Kg	
9	Details of galvanizing method Utilized and Standard/specification conforming to		
10	Weight of back clamp	kg	
11	Whether drawing has been submitted with the bid		

GTP N0 -33	GUARANTEED TECHNICAL PARTICULARS OF FLEXIBLE COPPER BOND		
Sl. No.	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
1	Stranding	37/ 7/ 0.417	
2	Cross sectional area(Sq.mm)	75.6	
3	Minimum copper equivalent area(sq.mm)	34(each individual wire)	
4	Length of copper cable(mm)	500	
5	Material Lugs	Tinned copper	
6	Bolt Size		
	(i) Diameter(mm)	16	
	(ii) Length(mm)	40	
7	Resistance(ohm)	0.0004(as per IS.2121)	
8	Total weight of Fexible copper bond(kg)	0.45(approx)	

GTP NO- 34 GUARENTEED TECHNICAL PARTICULARS OF Earthing Pipe			
Sl. No	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
		Multiplication Factor to Resistivity	
1	Length (mm)2000	0.21	
	3000	0.15	
2	Short Time Current Rating	25kA	
3	Inner Diameter	19mm Rod or 28mm Pipe	
4	Galvanization Range	Between 80 to 100 micro ohms	
5	Inner Space Contains	Heterogeneous Rich Crystalline Mixture	
6	Material	G.I Type	

GTP NO- 35	GURANTEED TECHNICAL PARTICULARS EARTHING COIL		
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Nominal diameter of wire	4.00mm (08 swg) with tolerance +/- 2.5%	
2	No. of turns	115nos	
3	External dia of Coil	50mm(min)	
4	Length of Coil	460mm(min)	
5	Mass of Zinc	280gm/ sq mm (before coiling) & 266 gm/sq mm after coiling	
6	Total weight of Coil	1.850kg (min)	
7	General Tolerance	+ / - 2.5 %	

GTP- 36

TECHNICAL SPECIFICATION OF LT THREE & HALF CORE XLPE (120SQMM, 95SQMM & 25SQMM CABLES) IN SUB STATION

Sl. No	Name of the Particulars	3x120 + 70 SQMM	Bidder's Offer	3X95 + 50 sqmm	Bidder's Offer	3X25 + 16 sqmm	Bidder's Offer
1	Type of cable	Aluminium Conductor ,XLPE Insulated		Aluminium Conductor ,XLPE Insulated		Aluminium Conductor ,XLPE Insulated	
2	Conductor Details						
a	No of Cores	3 &1/2		3 &1/2		3 &1/2	
b	Normal Cross-Sectional Area	3x120 + 70 SQMM		3X95 + 50 sqmm		3X25 + 16 sqmm	
c	Material and Grade	Aluminium compacted,Stranded as per IS: 8130 with latest amendment		Aluminium compacted,Stranded as per IS: 8130 with latest amendment		Aluminium compacted,Stranded as per IS: 8130 with latest amendment	
d	Shape of Conductor	Circular		Circular		Circular	
e	Diameter of Conductor	3X12.4 + 9.4 mm		3X11.0 + 8.0 mm		3X5.6 + 4.5 mm	

f	No. of Strands and Diameter of each Strand	as per IS 8130 with latest amendment		as per IS 8130 with latest amendment		as per IS 8130 with latest amendment	
3	Rated Voltage	1.1 kV		1.1 kV		1.1 kV	
4	Maximum Conductor temperature for	90^0 C		90^0 C		90^0 C	
5	Maximum conductor temperature during short circuit	250^0C		250^0C		250^0C	
6	Insulation						
a	Material	XLPE		XLPE		XLPE	
b	Nominal Thickness (Phase/ Neutral)	1.2/ 1.1 mm		1.1/ 1.0 mm		0.9/ 0.7 mm	

7	Vulcanization Process						
a	Curing Method	Dry Curing		Dry Curing		Dry Curing	
b	Cooling Method	Inert Gas		Inert Gas		Inert Gas	
8	Inner Sheath						
a	Material	PVC		PVC		PVC	
b	Thickness of inner sheath (mm)	0.4		0.3		0.3	
c	Diameter of Cable after inner sheath application	Manufacture to Specify		Manufacture to Specify		Manufacture to Specify	

9	Outer Sheath	PVC PVC		PVC PVC		PVC PVC	
a	Type	FR ST 2 as per IS 5831		FR ST 2 as per IS 5831		FR ST 2 as per IS 5831	
b	Colour	Black		Black		Black	
c	Thickness	2.2		2.2		2.0	
10	Nominal OVerall Diameter of Cable	Manufacture to Specify		Manufactur Specify		Manufacture to Specify	
11	Nominal Overall Weight of Cable per Metre	Manufacture to Specify		Manufacture to Specify		Manufacture to Specify	
12	Minimum Bending Radius al during installation	As per Is 1255 / 1983 with latest amendment		As per Is 1255 / 1983		As per Is 1255 / 1983	

13	Short Circuit Current Rating of for 1 Sec	11.28 kA		8.93 KA		2.35 KA	
14	Soil Parameter						
a	Soil Temperature	30℃		30℃		30℃	
b	Ambient Temperature	50℃		50℃		50℃	
c	Soil Thermal Resistivity	150℃ Cm/W		150℃ Cm/W		150℃ Cm/W	
15	Normal current rating in ampere						
a	Groun d	225A		200A		95A	

b	Ducts	185A		165A		80A	
c	Air	258A		221A		99A	
16	Maximum DC Resistance at 20°C ohm/km	0.253		0.320		1.20	
17	Maximum AC Resistance at 90°C ohm/km	0.325		0.411		1.54	
18	Reactance of Cable in in ohm/km	0.072		0.074		0.08	
19	capacitance of cable in micro farad/km	0.29		0.29		0.20	
20	Derating factor of Cable installed	As per IS		As per IS		As per IS	

GTP- 37
TECHNICAL SPECIFICATION OF LT FOUR CORE XLPE 16 SQMM CABLE IN SUB STATION

Sl. No	Name of the Particulars	4x16SQMM	Bidder's Offer
1	Type of cable	Aluminium Conductor ,XLPE Insulated	
2	Conductor Details		
a	No of Cores	4	
b	Normal Cross-Sectional Area	4x16SQMM	
c	Material and Grade	Aluminium compacted,Stranded as per IS: 8130 with latest amendment	
d	Shape of Conductor	Circular	
e	Diameter of Conductor	4X4.5 mm	

f	No. of Strands and Diameter of each Strand	as per IS 8130 with latest amendment	
3	Rated Voltage	1.1 kV	
4	Maximum Conductor temperature for	90^0 C	
5	Maximum conductor temperature during short circuit	250^0C	
6	Insulation		
a	Material	XLPE	
b	Nominal Thickness	0.7 mm	

7	Vulcanization Process		
a	Curing Method	Dry Curing	
b	Cooling Method	Inert Gas	
8	Inner Sheath		
a	Material	PVC	
b	Thickness of inner sheath (mm)	0.3	
c	Diameter of Cable after inner sheath application	Manufacture to Specify	

9	Outer Sheath	PVC	
a	Type	FR ST 2 as per IS 5831	
b	Colour	Black	
c	Thickness	0.3	
10	Nominal OVerall Diameter of Cable	Manufacture to Specify	
11	Nominal Overall Weight of Cable per Metre	Manufacture to Specify	
12	Minimum Bending Radius al during installation	As per Is 1255 / 1983 with latest amendment	

13	Short Circuit Current Rating of for 1 Sec	1.5 kA	
14	Soil Parameter		
a	Soil Temperature	30℃	
b	Ambient Temperature	50℃	
c	Soil Thermal Resistivity	150℃ Cm/W	
15	Normal current rating in ampere		
a	Groun d	78A	

b	Ducts	61A	
c	Air	70A	
16	Maximum DC Resistance at 20°C ohm/km	1.91	
17	Maximum AC Resistance at 90°C ohm/km	2.44	
18	Reactance of Cable in in ohm/km	0.080	
19	capacitance of cable in micro farad/km	0.18	
20	Derating factor of Cable installed	As per IS	

GTP- 38

TECHNICAL SPECIFICATION OF LT TWO CORE XLPE 16 SQMM CABLE IN SUB STATION

Sl. No	Name of the Particulars	4x16SQMM	Bidder's Offer
1	Type of cable	Aluminium Conductor ,XLPE Insulated	
2	Conductor Details		
a	No of Cores	2	
b	Normal Cross-Sectional Area	2x16SQMM	
c	Material and Grade	Aluminium compacted,Stranded as per IS: 8130 with latest amendment	
d	Shape of Conductor	Circular	
e	Diameter of Conductor	2X4.5 mm	

f	No. of Strands and Diameter of each Strand	as per IS 8130 with latest amendment	
3	Rated Voltage	1.1 kV	
4	Maximum Conductor temperature for	90^0 C	
5	Maximum conductor temperature during short circuit	250^0C	
6	Insulation		
a	Material	XLPE	
b	Nominal Thickness	0.7 mm	

7	Vulcanization Process		
a	Curing Method	Dry Curing	
b	Cooling Method	Inert Gas	
8	Inner Sheath		
a	Material	PVC	
b	Thickness of inner sheath (mm)	0.3	
c	Diameter of Cable after inner sheath application	Manufacture to Specify	
9	Outer Sheath	PVC	
a	Type	FR ST 2 as per IS 5831	

b	Colour	Black	
c	Thickness	1.8	
10	Nominal OVerall Diameter of Cable	Manufacture to Specify	
11	Nominal Overall Weight of Cable per Metre	Manufacture to Specify	
12	Minimum Bending Radius all during installation	As per Is 1255 / 1983 with latest amendment	
13	Short Circuit Current Rating of for 1 Sec	1.5 kA	
14	Soil Parameter		
a	Soil Temperature	30℃	
b	Ambient Temperature	50℃	
c	Soil Thermal Resistivity	150℃ Cm/W	
15	Normal current rating in ampere		

a	Ground	78A	
b	Ducts	61A	
c	Air	70A	
16	Maximum DC Resistance at 20°C ohm/km	1.91	
17	Maximum AC Resistance at 90°C ohm/km	2.44	
18	Reactance of Cable in in ohm/km	0.080	
19	capacitance of cable in micro farad/km	0.18	
20	Derating factor of Cable installed	As per IS	

GTP No. 39 Technical particulars of ACSR – ZEBRA A. ACSR – ZEBRA			
Sl.No.	**ACSR CONDUCTOR:**	**ZEBRA**	**Bidder's Offer**
1	Size of conductor:	54/7/3.18 mm	
2	Stranding and wire diameter		
	Aluminum	54/3.18 mm	
	Steel	7/3.18 mm	
3	Sectional area of Aluminum (in mm2)	428.9	
4	Approximate total mass (in Kgs/KM)	1622	
5	Calculated resistance at 20°C Max.:(in Ohms/Km.)	0.06868	
6	Calculated breaking load of: composite conductor (in KN)	130.32 KN.	
	(U.T.S.) (Min)		
7	Lay Rating :-		
	Steel core	Max- 28	
		Min-13	
	Aluminium Layers		
	12 Wire Layer	Max-17	
	(Innermost Layer)	Min - 10	
	18 Wire Layer	Max - 16	
	(Lay immediately beneath outside Layer:	Min - 10	
	24 wire layer (outside layer)	Max - 14	
		Min - 10	
8	Modulus of elasticity (in Kg / mm2):0.7036 x 106 Kg x CM2	8158	
9	Co-efficient of linear expansion of conductor per degree centigrade.	19.3 x 1 0-6	
10	Standard area of Cross Section in Sq. mm of	484.5 mm2	
11	Diameter of complete conductor in	28.62 mm	

B.Steel and Aluminum Wires				
1	Diameter	Steel	Aluminum	
	Standard (in mm)	3.18	3.18	
	Maximum (in mm)	3.24	3.21	
	Minimum (in mm)	3.12	3.15	
2	Cross Sectional Area of nominal Diameter Wire (in mm2)	7.942	7.942	
3	Weight (in Kg/KM)	61.95	21.47	
4	Minimum tensile strength:As per relevant ISS			
5	Minimum breaking load before stranding (in KN)	10.43	1.29	
6	Minimum breaking load: stranding (in KN)	9.91	1.23	
7	Zinc coating of steel strands			
	Number and duration:	3 dips of 1min		
	Minimum Weight of (A s per IS-4826 – 1979)	260 Coating (i n gm/ m2)		
8	Maximum resistance at: Ohms / KM)	3.626 2.974 20°C of Aluminum strands		
9	Minim Purity of aluminum rod:	99.50%		

CH- E-24 – GTP CONTENT Phase-IV-ODSSP

GTP No	Name of Items
1	33kV VCB (Indoor)
2	11kV VCB (Indoor)
3	33kV VCB (Outdoor)
4	11kV CT
5	33kV CT
6	33kV Insulator (B &S)
7	11kV Insulator (B &S)
8	LT Distribution Box
9	POWER TRF
10	STATION TRF 100 kVA
11	Transformer oil
12	33kv HG fuse
13	11kv HG fuse
14	33kv Isolator
15	11kV Isolator
16	33KV AB SWITCH
17	11KV AB SWITCH
18	100sqmm AAAC
19	148sqmm AAAC
20	33kv Pin Insulator
21	11kv Pin Insulator
22	33 kV Surge arrester
23	11kv Surge arrester
24	Numerical relay
25	33kV IVT
26	11 kV IVT
27	33kV & 11kV V cross arm
28	HT STAY SET
29	Stay Wire
30	Tension Clamp
31	Suspension Clamp
32	Back Clamp
33	Flexible Cu bond
34	Earthing Pipe
35	Earthing Coil
36	LT 3 half-core
37	LT 4-CORE
38	LT 2-CORE
39	ACSR Zebra

GTP NO -1 Guaranteed Technical Particulars of 33 KV VCB (Indoor)			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	33KV	
5	Highest system voltage	36KV	
6	Rated normal current at 50°C		
i)	For Bus-bar of Circuit Breaker	1250A	
ii)	For Interrupter	1250A	
7	Rated short circuit breaking current (rms)	25KA	
8	Rated short circuit making current (peak)	62.5KA	
9	Rated short time current withstand capability for 3 sec.	25 kA	
10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	70kV	

ii)	Impulse withstand voltage to earth with 1 .2/50psec, wave of +ve and —ve polarity (Peak)	170KV	
11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	48 V DC/230V A.C	
17	Rated supply voltage for trip/close coil	48V D.C	
18	Total break time in MS		
(a)	At 10% rated interrupting capacity	<80ms	
(b)	At rated interrupting current	<80ms	
19	Arcing Time	<15ms	
20	Make time	<100ms	
21	Minimum reclosing time at full rated interrupted MVA from the instant of Trip coil energisation	300ms	
22	Minimum dead time for 3 phase closing	300ms	
23	one time dry power frequency withstand test voltage between line terminal and ground objects	70kv	
24	one time dry power frequency withstand test voltage between terminal with breaker contacts open	80kv	

25	Type of main contacts		
26	Type of Aux. Contacts		
27	Materials of auxilliary contacts	Copper Alloy	
28	Voltage distribution between breaker		
29	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	ii) those open when breaker is closed	6	
30	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring operated	
	ii)Closing	Spring charged due to closing both manual and motorized Spring operated	
31	Frequency at which contacts are to be replaced	After 100 full short circuit operations	
32	Number of terminal connectors	6	
33	Short circuit type test certificate furnished		
34	Circuit breaker weight		

GTP NO-2 Guaranteed Technical Particulars of 11kV Circuit Breaker(Indoor)			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	11 kV	
5	Highest system voltage	12kV	
6	Rated normal current at 50°C		
i)	For Bus-bar of Circuit Breaker	1250A	
ii)	For Interrupter	1250A	
7	Rated short circuit breaking current (rms)	25kA	
8	Rated short circuit making current (peak)	62.5kA	
9	Rated short time current withstand capability for 3 sec.	25kA	

10	Rated insulation level:		
i)	one time dry power frequency withstand test voltage between line terminal and ground objects	28kV	
ii)	one time dry power frequency withstand test voltage between terminal with breaker contacts open	32 kV	
iii)	Impulse withstand voltage to earth with 1 .2/50 µsec, wave of +ve and —ve polarity (Peak)	75KV	
11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C	
17	Rated supply voltage for trip/close coil	48 V D.C	
18	Total break time in ms		
(a)	At 10% rated interrupting capacity	<80ms	
(b)	At rated interrupting current	<80ms	
19	Arcing Time	<15ms	
20	Make time	<100ms	

21	Minimum reclosing time at full rated interrupted MVA	300ms	
22	Minimum dead time for 3 phase closing	300ms	
23	Type of main contacts		
24	Type of Aux. Contacts		
25	Materials of auxilliary contacts	Copper Alloy	
26	Voltage distribution between breaker		
27	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	ii) those open when breaker is closed	6	
28	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring	
	ii)Closing	Spring charged due to closing both manual and motorized Spring operated	
29	Frequency at which contacts are to be replaced	After 100 full short circuit	
30	Number of terminal connectors	6	
31	Short circuit type test certificate furnished		
32	Circuit breaker weight		

GTP NO - 3 Guaranteed Technical Particulars of 33 KV VCB (Outdoor)			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	33KV	
5	Highest system voltage	36KV	
6	Rated normal current at 50°C		
i)	For Interrupter	1250A	
7	Rated short circuit breaking current (rms)	25KA	
8	Rated short circuit making current (peak)	62.5KA	
9	Rated short time current withstand capability for 3 sec.	25KA	
10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	70kv	
ii)	Impulse withstand voltage to earth with 1 .2/50psec, wave of +ve and —ve polarity (Peak)	170KV	

11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C	
17	Rated supply voltage for trip/close coil	48V D.C	
18	Minimum creepage distance (mm)	900 mm	
19	Minimum protected creepage distance (mm)	As Per IS	
20	Total break time in MS		
21	At 10% rated interrupting capacity	<80ms	
21 a	At rated interrupting current	<80ms	
21 b	Arcing Time	<15ms	
22	Make time	<100ms	

23	Minimum reclosing time at full rated interrupted MVA from the instant of Trip coil energisation	300ms	
24	Minimum dead time for 3 phase closing	300ms	
25	one time dry power frequency withstand test voltage between line terminal and ground objects	70kv	
26	onemin dry power frequency withstand test voltage between terminal with breaker contacts open	80kV	
27	Type of main contacts		
28	Type of Aux. Contacts		
29	Materials of auxilliary contacts	Copper Alloy	
30	Voltage distribution between breaker		
31	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	i) those open when breaker is closed	6	
32	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring operated	
	ii) Closing	Spring charged due to closing both manual and motorized Spring operated	

33	Frequency at which contacts are to be replaced	After 100 full short circuit operations	
34	Nos of terminal connector	6	
35	Short circuit type test certificate furnished		
36	Circuit breaker weight		
37	Minimum clearance in air		
	i) Between phases	>480mm	
	ii)Live parts to earth	>320mm	
	iii) Live parts to ground level	>3700mm	
	iv)Between Liver parts & ground object	>320mm	
38	Bushing of insulators		
	i) Type of bushing	Porcelain	
	ii)Dry 1 min power frequency withstand test voltage	70kV	
	iii) Dry flash over value	>75kV	

	iv) Wet flashover value	>75kV	
	v) 1.2/50 impulse withstand	170KVp	
	vi) Creepage distance	900 mm	
	vii) Puncture value of bushing	>75kV	
	viii) Weight of bushing	<45kG	

GTP NO - 4 GUARANTEED TECHNICAL PARTICULARS FOR 11KV CURRENT TRANSFORMERS

Sl. No.	Name of the Particulars	Desired Value	Bidder's Offer
1	Make		
2	Type of CT Installation	Single phase, dead tank, oil-filled Poly Crate hermetically sealed outdoor, self-cooled.	
3	Type of mounting	Pedestal type	
4	Suitable for system frequency	50 HZ (- 5% to +3%)	
5	Rated Voltage (KV rms)	11	
6	Nominal System Voltage (KV rms)	11	
7	Highest System Voltage (KV rms)	12	
8	Current Ratio (A/A)	400-200 -100/1-1 A	
9	Method of earthing the system where the current transformers will be installed	Effectively earthed	
10	Rated Continous Thermal Current (A)	120% of rated primary current	
11	Acceptable limit of temperature rise above 50^0C ambient temperature for continuous operation at rated continuous thermal current		
	(a)Winding	40^0C	
	(b) OIL	35^0C	

	(c)External surface of the core, metallic parts in contact with or adjacent to, insulation.	40ºC	
12	1.2/50 micro second lighting impulse withstand voltage (kVP) (dry)	75	
13	1 Minute dry power frequency withstand voltage primary (kV rms)	28	
14	1 Minute dry power frequency withstand voltage secondary (KV rms)	3	
15	Minimum creepage distance of porcelain Housing (mm)	350	
16	Rated short time withstand current for 3 second duration at all ratios (KA rms)	25	
	Instrument security factor at all ratios for metering core	Not more than 5.0	
17	Maximum rated short time thermal current density of the primary winding copper conductor (A/mm2) at all ratios	92	
18	Type of Core	Torroidal type	
19	Seismic acceleration	0. 15g (Vertical)	
		0.3g (Horizontal)	
20	Accuracy class of standard C.T to be used during testing towards determination of ratio errors and phase angle errors for metering cores.	0.05 or better.	

GTP NO -5 GUARANTEED TECHNICAL PARTICULARS FOR 33 KV CURRENT TRANSFORMERS			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Type of CT/Installation.	Single phase, dead tank, oil filled, hermetically sealed, outdoor, self-cooled	
3	Type of mounting.	Pedestal type	
4	Suitable for system frequency.	50 HZ (+ 5 % to -3%)	
5	Rated voltage (KV rms)	33	
6	Nominal system voltage (KV rms)	33	
7	Highest system voltage (KV rms)	36	
8	Current ratio (A/A)	a) 400-200/1-1-1A	
9	Method of earthing the system where the current transformer will be installed.	Solidly Effectively earthed.	
10	Rated continuous thermal current (A)	120 % of rated primary current	

11	Acceptable limit of temperature rise above 50°C ambient temperature for continous operation at rated continuous thermal current.		
(a)	Winding	45°C	
(b)	Oil	40°C	
(c)	External surface of the core, metallic parts in contact with or adjacent to, insulation.	4 5°C	
12	Acceptable partial discharge level	Less than 10 pico coulombs	
13	Maximum radio interference voltage at 1.1 times the maximum rated voltage.	Less than 500 micro volts	
14	l.2/50 micro second lightning impulse withstand voltage (KVP) (dry)	170	
15	1 minute dry power frequency withstand voltage primary (KV rms)	70	
16	Switching Impulse with stand and voltage (KVP)		
17	l Minute dry power frequency withstand voltage secondary (KV rms)	3	
18	Minimum creepage distance of porcelain Housing (mm)	900	
19	Rated short time withstand current for 3 second at all ratios (KA rms)	25KA	
20	Instrument security factor at all ratios for metering core.	Not more than 5.0	

21	Minimum rated short time thermal current density of the primary winding at all ratios (A/mm$^{2)}$	As per clause No9.6.3- Note of IS: 2705 (Part-I)/l992	
22	Application, current ratio, output burden, accuracy class, minimum knee point voltage, secondary winding resistance, maximum excitation current at minimum knee point voltage etc.		
23	Type of core		
24	Seismic acceleration	0.15g (Vertical) 0.3g (Horizontal)	
25	Accuracy class of standard C.T. to be used during testing towards determination of ratio errors and phase angle errors for metering cores.	0.05 or better.	

GTP No-48 Guaranteed Technical Particulars of 33 kv Insulator-90 KN (B & S Type)			
Sl. No.	Particulars	Desired Value	Bidder's Data
1	Name of the Manufacturer		
2	Type of Insulator	Polymer Composite	
3	Standard according to which the insulators manufactured and tested.	IEC 61109	
4	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA	
(a)	Material of core(FRP rod)	ECR or BORRON FREE	
	(I) E-glass of ECR-glass.		
	(II)Boom content		
(b)	Material of housing Et weathersheds (silicon content by weight)	SILICON RUBBER 43 %	
(c)	Material of end fittings	SGI	
(d)	Sealing compound for end fittings	RTV SILICON	
5	Colour	GREY	
6	Electrical Characterstics		
(a)	Nominal system voltage	33 KV	

(b)	Highest system voltage	36 KV	
(c)	Dry Power frequency withstand voltage	105 KV	
(d)	Wet Power frequency withstand voltage	75 KV	
(e)	Dry flashover voltage	80 KV	
(f)	Wet flash over voltage	75 KV	
(g)	Dry lighting impulse withstand voltage		
	(a) Positive	170 KV	
	(b) Negative	170 KV	
	b) Negative.	180 KV	
(h)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.	40	
(i)	Creepage distance (Min.)	900 MM	
7	Mechanical characteristics Minimum failing load.	90KN	
8	Dimensions of insulator		

(i)	Weight	1 .6	
(ii)	Dia of FRP rod	16 MM	

(iii)	Length of FRP rod	440 MM	
(iv)	Dia of weathersheds	100 MM	
(v)	Thickness of housing	3 MM	
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight) enclosed.	382 MM	
9	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression moulding)	Injection moulding	
10	No of weathersheds	8	
11	Type of sheds		
i)	Aerodynamic	Aerodynamic	
ii)	With underribds		
12	Type of packing	Wooden Box	

13	Any other particulars which the bidder may like to give.		
14	The insulators shall have "W" type phosphors Bronze security clips for ball sockets portion of insulators confirming to IS-2486 (P-III/1 974).	YES	

GTP NO-49 Guaranteed Technical Particulars of 11 kv Insulator (B & S Type)			
BIDDER HAS TO CONFIRM FOLLOWING IMPORTANT REQUIREMENT:			
Sl. No.	Particulars	Desired Value	Bidder's Data
1	Name of the Manufacturer :		
2	Type of Insulator	Polymeric Composite	
3	Standard according to which the insulators manufactured and tested.	IEC 61109	
4	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA	
(a)	Material of core(FRP rod)	ECR or BORRON FREE	
	(I)E-glass of ECR-glass.		
	(II)Boom content		
(b)	Material of housing Et weathersheds (silicon content by weight)	SILICON RUBBER 43 %	
(c)	Material of end fittings	SGI	
(d)	Sealing compound for end fittings	RTV SILICON	
5	Colour	GREY	

6	Electrical Characterstics		
(a)	Nominal system voltage	11 KV	
(b)	Highest system voltage	12 KV	
(c)	Dry Power frequency withstand voltage	45 KV	
(d)	Wet Power frequency withstand voltage	35 KV	
(e)	Dry flashover voltage	50 KV	
(f)	Wet flash over voltage	40 KV	
7	Dry lighting impulse withstand voltage		
	(a) Positive	75 KV	
	(b) Negative	75 KV	

8	No of weathersheds	3	
9	Type of sheds		
i)	Aerodynamic	Aerodynamic	
ii)	With underribds		
10	Type of packing	Wooden Box	
11	The insulators shall have "W" type phosphors Bronze security clips for ball sockets portion of insulators confirming to IS-2486 (P-III/1974).	YES	
12	Any other particulars which the bidder		

GTP No-8 LT Distribution Box

Sl No	Dimension / Description	63 KVA	Bidder''s offer	100 KVA	Bidder''s offer
1	A	700		1000	
2	B	600		800	
3	C	400		500	
4	D	80		170	
5	E	90		250	
6	Incomer 4Pole MCCB	100 A, with Over Current Setting 80% to 100%		200 A, with Over Current Setting 80% to 100%	
7	Cable Size for Incomer	50 mm2 , 3 1/2 core cable		95 mm2 , 3 1/2 core cable	
8	Three Pole MCCB for out- going feeder	50 Amp, with Over Current Setting 80% to 100% (2sets each)		100 Amp, with Over Current Setting 80% to 100% (2sets each)	

GTP No-8 LT Distribution Box

9	Bus Bar for Incoming & Out going feeders	25 x 6 mm		40 x 6 mm	
10	Bus Bar material	Electrolytic Aluminium		Electrolytic Aluminium	
11	A neutral Bus bar similar to phase Bus bar is to be provided.				

GTP NO-9 GUARANTEED TECHNICAL PARTICULARS FOR POWER TRANSFORMERS OF 5 MVA & 8 MVA		
Sl. No .	**Name of the Particulars**	**Bidder's offer**
1	Name and address of the Manufacturer	
a)	Transformer	
b)	HV & LV Bushings	
c)	Bimetallic connectors	
d)	Transformer Oil	
e)	On load tap changer	
f)	Instruments	
g)	Neutral Bushing CTs	
2	Service (Indoor / Outdoor)	
3	Normal continuous rating in KVA under site conditions at all taps :	
a)	HV winding (KVA)	
b)	LV winding (KVA)	
4	Rated Voltage	
a)	HV winding (KV)	
b)	LV winding (KV)	
5	Rated frequency (Hz)	
6	No. of phases	
7	Type of transformer	
8	Connections	
a)	HV winding	
b)	LV winding	
9	Connections symbols	
	HV – LV	
10	Tappings	

a)	Range	
b)	Number of steps	
c)	Position of tapping on HT winding for high voltage variation	
11	Reference ambient temperatures	
a)	Maximum ambient air temperature (^{0}C)	
b)	Maximum daily average ambient temperature (^{0}C)	
c)	Minimum ambient air temperature (^{0}C)	
d)	Maximum yearly weighted average ambient temperature (^{0}C)	
12	Maximum temperature rise over ambient temperature	
a)	Top oil by thermometer (^{0}C)	
b)	HV & LV windings by resistance measurement (0C)	
c)	Hot Spot Temperature rise of windings(^{O} C)	
d)	Limit for hot spot temperature for which the transformer is designed (^{O} C)	
e)	Temperature gradient between windings and oil (^{0}C)	
f)	Type of maximum winding temperature indicator (^{0}C)	
13	Voltage to earth for which the star point will be insulated	
14	Cooling type	
15	Losses	
a)	No-Load loss at rated voltage & rated frequency (KW)	
b)	Load loss at rated current at Normal Tap at 75^0 C (KW)	
16	Max. Current density in winding at rated current for normal tap position	
a)	HV winding (Amps/ sq.mm.)	
b)	LV winding (Amps / sq.mm.)	
17	Impedance voltage at rated current ,rated frequency and at 75^0 C expressed as percentage of rated voltage at :-	
a)	Principal (normal) tap (%)	
b)	Highest tap (%)	

c)	Lowest tap (%)	
18	Reactance at rated current & frequency as percentage of rated voltage at:	
a)	Principal (normal) tap	
b)	Highest Tap	
c)	Lowest Tap	
19	Resistance at 75^{o} C	
a)	H.V. winding at normal tap position	
b)	L.V. winding	
c)	Resistance voltage drop at 75^{o} C winding temperature expressed as percent of rated voltage (%)	
	i) Principal/ normal tap	
	ii)Highest tap	
	iii) Lowest tap	
20	Insulation level	
a)	Separate source power frequency voltage withstand	
	i) HV winding (KV rms)	
	ii)LV winding (KV rms)	
b)	Induced over voltage withstand	
	i) HV winding (KV rms)	
	ii)LV winding (KV rms)	
c)	Full wave lightning impulse withstand voltage	
	i) HV winding (KV peak)	
d)	Power frequency high voltage tests	
	i) Test voltage for one minute withstand test on high voltage windings (induced)	
	ii) Test voltage for one minute withstand test on low voltage windings	
	iii) Test voltage for one minute withstand test on neutral end of low voltage windings	
e)	Lightning impulse withstand tests	

	i) Impulse test on high voltage winding 1.2/50 p sec full wave withstand (KV peak)	
	ii) Impulse test on low voltage winding 1.2/50 p sec full wave withstand (KV peak)	
	iii) Wave form for impulse test	
21	No load current, no load loss, no load power factor at normal ratio and frequency (Amp/ KW/ P.F.)	
a)	10 percent of rated voltage	
b)	25 percent of rated voltage	
c)	50 percent of rated voltage	
d)	85 percent of rated voltage	
e)	100 percent of rated voltage	
f)	105 percent of rated voltage	
g)	110 percent of rated voltage	
h)	112.5 percent of rated voltage	
i)	115 percent of rated voltage	
j)	120 percent of rated voltage	
k)	121 percent of rated voltage	
22	Efficiency at 75° C at unity power factor	
a)	Full load	
b)	75% load	
c)	50% load	
d)	25% load	
23 (a)	The minimum percentage of load at which the transformer will run at maximum efficiency (%)	
b)	Maximum efficiency of the transformer	
24	Regulation at full load at 75° C	
a)	At unity power factor (%)	
b)	At 0.8 power factor (lagging) (%)	
25	Core data	
a)	Grade of core material used	
b)	Thickness of core plate lamination (mm)	

c)	Whether core laminations are of HIB cold rolled grain oriented	
d)	Details of oil ducts in core, if any	
	i) Whether in the plane & at right angle to the plane of winding	
	ii) Across the plane of lamination	
e)	i) Insulation of core lamination	
	ii) Insulation of core plates	
	iii) Type of core joints(Mitred or Mitred Step-lap)	
26	Flux density	
a)	Designed maximum flux density at rated voltage and rated frequency (Tesla)	
b)	Designed maximum operating flux density which the transformer can withstand for one minute at normal tap (Tesla)	
c)	Designed maximum operating flux density which the transformer can withstand for five seconds at normal tap (Tesla)	
27	Inter-Tap insulation	
a)	Extent of extreme end turns reinforcement	
b)	Extent of end turns reinforcement	
c)	Extent of turn adjacent to tapping reinforced	
d)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (a)	
e)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (b)	
f)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (c)	
28	Windings:	
a)	Material	
b)	Type of windings:	
	i) HV windings	
	ii) LV windings	

c)	Insulation of HV windings	
d)	Insulation of LV windings	
e)	Insulation between HV & LV windings	
29	Continuous rating under following conditions:	
a)	At 40°C ambient air temp. at site	
b)	At 30°C ambient air temp. at site	
c)	At 20°C ambient air temp. at site	
30	Transformer Tank	
a)	Material	
b)	Thickness	
	- Top	
	- Sides	
	- Bottom	
c)	Details of painting	
	- Inner surface	
	- Outer surface	
31	Dimensions of 3 phase transformers:	
a)	Max. Height to top of bushings (mm)	
b)	Over-all length (mm)	
c)	Over-all breadth (mm)	
32	Weight data of transformer components : (Tolerance + 5%) (approximate values not allowed)	
a)	Core excluding clamping (Kg)	
b)	Core with clamping (Kg)	
c)	HV winding insulated conductor (Kg)	
d)	LV winding Insulated conductor (Kg)	
e)	Coils with insulation (Kg.)	
f)	Core and windings (Kg)	
g)	Weight of steel (Kg)	
h)	Fittings and accessories (Kg)	
i)	Oil required for first filling including 10% extra (ltrs / Kg)	
	1. Oil in main tank (Ltrs)	

	2. Oil in the conservator (Ltrs)	
	3. Oil in the radiators (Ltrs)	
	4. Oil in the OLTC (Ltrs.)	
	5. Overall total quantity of oil with 10% extra oil for first filling (ltrs / Kg)	
j)	1. Transportation weight excluding accessories (Kg)	
	2. Shipping details	
	i) Weight of heaviest package (Kg.)	
	ii) Dimension of largest package (Kg)	
k)	Untanking weight (Kg)	
l)	Total weight of transformer with oil and fittings (Kg)	
33	Bushing data :	
a)	Type of bushing insulator	
	i) HV	
	ii) LV	
	iii) Neutral	
b)	Material of bushing (inner part / outer part)	
c)	Weight of bushing insulator (Kg.)	
d)	Quantity of oil in one bushing (lt.)	
e)	Minimum dry withstand & flash over power frequency voltage of bushing (KV)	
f)	Minimum wet withstand & flash over power frequency voltage of bushing (KV)	
g)	Minimum withstand & flashover impulse level (KV)	
h)	Voltage rating (KV)	
i)	Current rating (Amps.)	
j)	Thermal Short Time current & Duration	
k)	Rated Dynamic current & its duration	
l)	Cantilever with stand loading	
m)	Clearance in oil	
	- phase to phase (mm)	

	- phase to earth (mm)	
n)	Creepage distance in oil & air (mm)	
o)	Minimum level of immersing / medium (oil) (mm)	
p)	Maximum pressure of immersing medium (oil) Kg/ cm^2	
q)	Free space required at top for removal of bushings (mm)	
r)	Angle of mounting	
34	Details of CT to be provided in the neutral for REF protection.	
a)	Outdoor bushing type	
b)	No. of cores and their function	
c)	Location (Line / Neutral)	
d)	Current rating for various cores (Primary / Secondary)	
e)	VA burden / Knee Point voltage (Core wise)	
f)	Magnetising current at half knee point voltage. (mA)	
g)	Classification (PS class) core wise	
h)	Test voltage	
i)	Construction details	
35	Conservator (Main Transformer and OLTC)	
a)	Total volume of the Conservator (Cub mtr / Ltr.)	
b)	Volume of the conservator between the highest and lowest level (Cubic mtr. / Ltrs)	
36	Calculated time constants for natural cooling	
37	Type of axial coil supports :	
a)	HV winding	
b)	LV winding	
38	Details of On Load tap changer	
a)	Make	
b)	Type	
c)	Rating	

	i) Rated Voltage	
	ii) Rated current	
	iii) Step voltage	
	iv) Number of steps	
	v)Rated Short Circuit Current	
d)	Whether Diverter switch provided with gas vent and buchholz relay (Yes / No)	
e)	Whether a separate oil surge relay with trip contacts provided (Yes / No)	
f)	Pressure relief valve	
g)	Details of motor device unit housed in kiosk / mounted on tap changer	
	h) running Whether Remote control panel provided with Control scheme for simultaneous operation of Tap changer when transformers are in parallel and independent control when in independent	
i)	Details of equipment in the OLTC kiosk	
j)	Details of OLTC panels	
	i) automatic tap changer relay	
	ii) literature of all the relays	
	iii) dimensions of OLTC, Panel L x B x H	
	iv) thickness of sheet	
	v) degree of protection	
	vi) details of equipment supplied	
39	Dispatch details :	
a)	Approx. mass of heaviest Package (Kg)	
b)	Approx. dimensions of largest Package	
	i) Length (mm)	
	ii) Breadth (mm)	

	iii) Height (mm)	
40	Un-tanking height (mm)	
41	Bimetallic connectors HV / LV	
a)	Normal current rating (A)	
b)	Short time current rating (A)	
c)	Tensile strength (Kg)	
d)	Maximum temperature limit	
e)	Dimensional sketch enclosed indicating tolerances (Yes/No)	
f)	Minimum clearance (mm)	
	- Phase to phase	
	- Phase to Earth	
	42CORE ASSEMBLY :-	
a)	Core diameter (mm)	
b)	Core window height (mm)	
c)	Core leg centre (mm)	
d)	Gross core cross – sectional area (m^2)	
e)	Total height of core (mm)	
f)	Details of top end frame	
g)	Details of Bottom end frame	
h)	Details of clamp plate (material, thickness, insulation)	
i)	Total core weight (Kg)	
j)	Core loss, basing on core loss graph at operating flux density (rated voltage and rated frequency) (KW)	
k)	Core stacking factor	
l)	Net core area (Sq.m)	
m)	Margin towards corner joints, cross-fluxing, dielectric loss (KW)	
n)	Total core loss at rated voltage and rated frequency (KW)	
o)	Describe location / method of core grounding	
p)	Details of core- belting	
	i)Material , grade and type	

	ii) Width	
	iii) Thickness	
	iv)Fixing method	
43	DETAILS OF WINDING	
a)	Type of winding	
b)	Material of the winding conductor	
c)	Maximum current density of windings at rated current and conductor area	
d)	Whether windings are pre-shrunk ?	
e)	Whether adjustable coil clamps are provided for HV and LV windings ?	
f)	Whether steel rings are used for the windings ? If so, whether these are split ?	
g)	Whether electrostatic shields are provided to obtain uniform voltage distribution in the windings ?	
h)	Winding Insulation (Type & Class)	
i)	Insulating material , used for	
	i) H.V winding	
	ii) LV winding	
	iii) Tapping connection	
j)	Insulating material used between	
	i) L.V and H.V winding	
	ii)Core & L.V winding	
k)	H.V to H.V winding between phases	
l)	Type of axial supports	
	i) H.V winding	
	ii) L.V winding	
m)	Type of radial supports	
	i) H.V winding	
	ii) L.V winding	
n)	Maximum allowable torque on coil clamping bolts	
o)	Clamping ring details	
	i) Thickness of ring mm	

	ii)Diameter of ring mm	
	iii)No. & size of pressure screw	
p)	Bare conductor size (mm)	
	i) HV	
	ii)LV	
q)	Insulated conductor size (mm)	
	i) HV	
	ii)LV	
r)	No. of conductor in parallel (Nos.)	
	i) HV	
	ii)LV	
s)	No. of turns / phase	
	i) HV	
	ii)LV	
t)	No. of discs / phase	
	i) HV	
	ii)LV	
u)	No. of turns / Disc	
	i) HV	
	ii)LV	
v)	Gap between discs (mm)	
	i) HV	
	ii)LV	
w)	Inside diameter (mm)	
	i) HV	
	ii)LV	
x)	Outside diameter (mm)	
	i) HV	
	ii)LV	
y)	Axial height after shrinkage (mm)	
	i) HV	
	ii)LV	
z)	D.C Resistance	
i)	L.V winding at 75^0 C (Ohms)	

ii)	H.V winding at normal tap at 75^0 C (Ohms)	
iii)	H.V winding at highest tap at 75^0 C (Ohms)	
iv)	H.V winding at lowest tap at 75^0 C (Ohms)	
v)	Total I^2R losses at 75^0 C for normal tap (KW)	
vi)	Total I^2R losses at 75^0 C for highest tap (KW)	
vii)	Total I^2R losses at 75^0 C for lowest tap (KW)	
vii i)	Stray losses including eddy current losses in winding at 75^0 C (KW)	
	a) Normal tap position	
	b) Highest tap position	
	c) Lowest tap position	
	d) Any special measures, taken to reduce eddy current losses and stray losses. Mention in details	
ix)	Load losses at 75^0 C (I^2 R + Stray)	
	a) Normal tap position (KW)	
	b) Highest tap position (KW)	
	c) Lowest tap position (KW)	
x)	Details of special arrangement, provided to improve surge voltage distribution in the windings.	
44	DETAILS OF TANK :	
a)	Material of Transformer tank	
b)	Type of tank	
c)	Thickness of sheet (No approximate value to be mentioned)	
	i) Sides (mm)	
	ii) Bottom (mm)	
	iii) Cover (mm)	
	iv) Radiators (mm)	

d)	Inside dimensions of main tank (No approximation in dimensions to be used)	
	i) Length (mm)	
	ii) Breadth (mm)	
	iii) Height (mm)	
e)	Outside dimensions of main tank (No approximation in dimensions to be used)	
	i) Length (mm)	
	ii) Breadth (mm)	
	iii) Height (mm)	
f)	Vacuum recommended for hot oil circulation (torr / mm of Hg)	
g)	Vacuum to be maintained during oil filling in transformer tank (torr / mm of Hg)	
h)	Vacuum to which the tank can be subjected without distortion (torr / mm of Hg)	
i)	No. of bi-directional wheels provided	
j)	Track gauge required for the wheels	
	i) Transverse axis	
	ii) Longitudinal axis	
k)	Type and make of pressure relief device and minimum pressure at which it operates (Kpa)	
45	CONSERVATOR :-	
a)	Thickness of sheet (mm)	
b)	Size (Dia x length) (mm)	
c)	Total volume (Litres)	
d)	Volume between the highest and lowest visible oil levels (Litres)	

GTP NO- 10 GUARANTEED AND OTHER PARTICULARS FOR 100kVA STATION TRANSFORMERS			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make		
2	Name of Manufacturer		
3	Place of Manufacture		
4	Voltage Ratio	33/0.4kV	
5	Rating in kVA	100kVA	
6	Core Material used and Grade:		
	a)	Flux density	
	b)	Over fluxing without saturation	
		(Curve to be furnished by the	
		Manufacturer in support of his claim)	
7	Maximum temperature rise of:		
	a)	windings by resistance method	
	b)	Oil by thermometer	
8	Magnetizing (no-load) current at:		
	a)	90% Voltage	
	b)	100% Voltage	
	c)	110% Voltage	
9	Core loss in watts:		
	a)	Normal voltage	
	b)	Maximum voltage	
10	Resistance of windings at 20°C,75^{0}C		
	(with 5% tolerance)		
a)	HV Winding (ohms)		
b)	LV Winding (ohms)		
11	Load losses (watts) at 75°C at normal tap(100% Load Condition)		

12	TOTAL Losses (Load loss +No Load Loss)at 100% load at 75°C at rated Voltage, frequency & at normal tap.		
13	Total Losses at 50% load at 75°C		
14	Current density used for: (Ampere/sq mm)		
	a)	HV Winding.	
	b)	LV Winding.	
15	Clearances: (mm)		
	a)	Core and LV	
	b)	LV and HV	
	c)	HV Phase to phase	
	d)	End insulation clearance to	
	e)	Any point of winding to tank.	
16	Efficiency at 75°C		
	a)	Unity P.F and	
	b)	0.8 P.F.	
	1)	125°C load	
	2)	100°C load	
	3)	75°C load	
	4)	50°C load	
	5)	25°C load	
17	Regulation at:		
	a)	Unit P.F.	
	b)	0.8 P.F. at 75ºC	
18	% Impedance at 75ºC		
19	Flash test:-		
	(i)	HV 70 kV/ 50HZ for 1 minute	
	(ii)	LV 3 kV /50 Hz for 1 minutes.	
20	Over potential test (Double voltage and		
	Double frequency for 1 minute)		

21	Impulse test.		
22	Mass of : (kg)		
	a)	Core lamination (minimum)	
	b)	Windings (minimum)	
	c)	Tank and fittings	
	d)	Oil	
	e)	Oil quantity (minimum) (litre)	
	f)	Total weight	
23	Oil Data:		
	1)	Quantity for first filling (minimum) (litre)	
	2)	Grade of oil used.	
	3)	Maker's name	
	4)	BDV at the time of filling (kV)	
24	Transformer:		
	1)	Overall length x breadth x height (mm x mm x mm)	
	2)	Tank length x breadth x height	
	3)	Thickness of plates for	
	a)	Side plate (min)	
	b)	Top and bottom plate (min)	
	4)	Conservator Dimensions.	
25	Radiation:		
	1) excluding	Heat dissipation by tank walls top and bottom	
	2)	Heat dissipation by cooling tube	
	3)	Diameter and thickness of cooling tube.	
	4)	Whether calculation sheet for selecting cooling	

		area to ensure that the transformer is capable	
		of giving continuous rated output without	
		exceeding temperature rise is enclosed.	
26	Inter layer insulation provided in design for:		
	1)	Top and bottom layer	
	2)	In between all layer	
	3)	Details of end insulation.	
	4)	Whether wedges are provided at 50ºC turns of the HV coil.	
27	Insulation materials provided.		
	a)	For Conductors	
		1 HV	
		2 LV	
	b)	For Core.	
28	Material and Size of the wire used.		
		HV	
		Dia (mm)	
		Number of conductors in	
		Total cross sectional area	
		LV	
		Dia (mm)	
		Number of conductors in	
		Total cross sectional area	
29	Whether the name plate gives all particulars as required in		
30	Particulars of bushings HV/LV		
	1)	Maker’s name	
	2)	Type IS-3347/IS-2099/IS-7421	

	3)	Rating as per IS	
	4)	Dry power frequency voltage withstand test	
	5)	Wet power frequency voltage withstand test.	
Note:			
The following shall be specifically confirmed:			
1)	Whether the offer conforms to the limits of impedance mentioned in the specification.		
2)	Whether the offer conforms to the limits of temperature rise mentioned in the specification.		
3)	Whether the losses of the transformers offered are within the limits specified.		
4)	Whether the transformer offered is already type tested for the design and test reports enclosed.		

Sl. No.	Description	To be specified by Bidders
1	Core Grade	
2	Core diameter(mm)	
3	Gross core area(Sq cm)	
4	Net core area(Sq cm)	
5	Flux density(Tesla)	
6	Mass of core(Kg)	
7	Loss per kg of core at the specified flux density(watt)	

8	Core window height(mm)	
9	Center to enter distance of the	
10	No.of LV Turns	
11	No.of HV turns	
12	Size of LV conductor bare/covered (mm)	
13	Size o HV conductor bare/covered (mm)	
14	No. of parallels	
15	Current density of LV winding.(A/sq mm)	
16	Current density of HV winding.(A/sq mm)	
17	Wt. of the LV winding for Transformer (kg)	
18	Wt. of the HV winding for Transformer (Kg)	
19	No. of LV Coils/phase	
20	No. of HV Coils/phase	
21	Height of LV Winding.(mm)	
22	Height of HV Winding.(mm)	
23	ID/OD of HV winding(mm)	
24	ID/OD of LV winding(mm)	
25	Size of the duct in LV winding(mm)	

26	Size of the duct in HV winding(mm)	
27	Size of the duct between HV and LV(mm)	
28	HV winding to LV winding	
29	HV winding to tank clearance(mm)	
30	Calculated impedance(%)	
31	HV to earth creepage distance(mm)	
32	LV to earth creepage distance(mm)	

GTP NO - 11 GUARANTEED TECHNICAL PARTICULARS of Transformer OIL			
SL. NO.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Appearance	Clear and transparent free from suspended matter or sediments.	
2	Density at 29.5° C (Max) gm/cc	0.89	
3	Viscosity, Kinematic at 27° C (Max)	27	
4	Interfacial Tension at 27° C (Min) Newton / M	0.04	
5	Flash point, Pensky Marten (closed) in °C (min).	140	
6	Pour point in ° C (Max)	-6	
7	Neutralisation value		
	a) Total acidity, mg KOH/gm (Max)	0.03	
	b) Inorganic acidity / alkalinity	Nil	
8	Corrosive sulphur (Copper strip) 19 hours at 140°C	Non corrosive	
9	Electric strength (Breakdown Voltage) KV (rms).		
	a) New unfiltered oil (min).	60	
	b) After filteration (min).	60	
10	Dielectric dissipation factor (Tan Delta) at 90°C (Max).	0.002	

11	Specific resistance (resistivity)		
	a) at 90° C , ohm-cms (Min)	35×10^{12}	
	b) at 27° C , ohm-cms (Min)	1500×10^{12}	
12	Oxidation stability.		
	a) Neutralisation value, after Oxidation for 164 hours at 100°C mg KOH/gm (Max).	0.4	
	b) Total sludge, after 164 hours at 100°C wt. % (max).	0.1	
13	Ageing characteristics after accelerated Ageing (open beaker method with copper Catalyst) for 96 hours at 115°C		
	a) Specific resistance(resistivity)		
	i) at 27°C, ohm-cms (Min)	2.5×10^{12}	
	i) at 90°C, ohm-cms (Min)	0.2×10^{12}	
	b) Dielectric dissipation factor (Tan Delta) at 90°C, , ohm-cms (Min)	0.2	
	c)Total acidity, mg KOH/gm (max)	0.05	
	d) Total sludge value, Wt. % (max)	0.05	

14	Presence of oxidation inhibitor	The oil shall not contain anti oxidant additives.	
15	Water content, ppm (max)	20	
16	i) Proportion of classes of hydrocarbons in the crude oil including content of aromatic hydrocarbons.		
	ii) Details of barrel (Size, gauge inside/outside coating/weight of empty drum not less than 18 Kg.)		
	iii) List of equipments for testing of oil as per revised ISS		
	iv)Electric strength(breakdown voltage) KV (Min)		
	a) Value of the fresh sample in the supplied sealed drums KV(Min).		
	b) Value after filling in transformer upto & within 3 months (Min)		

GTP NO-12 GUARANTEED TECHNICAL PARTICULARS FOR 33kV , 200 AMP, 3 POLE, H.G. FUSE			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Maker's name and country or origin	To be specified by the tenderder.	
2	Suitable for mounting	Horizontal only.	
3	Number of supporting post insulator per phase	4 nos. 22KV/24KV Post Insulator per phase as per ISS - 2544/ 1973	
4	Post Insulator		
(a)	Maker's name and country or orgin	To be specified by the tenderder.	
(b)	Type of cemeting	To be quoted original cemented only.	
(c)	One minute power frequency withstand voltage dry	80 KV RMS	
(d)	One minute power frequency withstand voltage wet.	70 KV RMS.	
(e)	Visible discharge voltage	27 KV RMS	
(f)	Dry Flashover Voltage	To be specified by the tenderder.	
(g)	Power frequency puncture withstand voltage	1.3 times of actual dry flash over voltage.	
(h)	Impulse withstand voltage(Switching Position)	170KV (peak)	
(I)	Creepage distance	380mm minimum. (actual creepage distance for which type test have been conducted is to be specified by the bidder)	
5	Impulse withstand voltage for positive and negative polarity (1.2/50 micro second wave)		
(a)	Across the isolating distance	195 KV (peak)	
(b)	To earth & between poles	170 KV (peak)	

6	One minute power frequency withstand voltage		
(a)	Across the isolating distance	80 KV (RMS)	
(b)	To earth & between poles	70 KV (RMS)	
7	Rated normal current and rated frequency.	200 amps, 50 Hz , 3 Pole	
8	Operating Voltage	33 KV	
9	Vertical clearance from top of insulator cap to mounting Channel	508 mm (minimum)	
10	Height of the riser for carrying the horns.	250mm from the cap (top) of insulator.	
11	Details of Arcing Horns	Copper rod having 8.32 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper casting. (Total length 995mm). All the bolts, nuts and washers should be made out of brass.	
12	Riser Unit (250mm total height).	(a) The shape of connectors may be made of straight copper Flat of	
		(b) 170mm height G.I. Riser made of 25mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 35 x 5 mm at both ends fixed with 10mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13	Supporting Channels	100 x 50 x 6 mm M.S. Channel (galvanized)	
14	Galvanisation	All ferrous parts should be galvanized as per IS-2633/1 972 & all non-ferrous part should be duly electroplated with silver.	
15	Weight of each pole (complete)	To be specified by the tenderder.	

GTP NO-13 GUARANTEED TECHNICAL PARTICULARS FOR 11kV 200 AMP, 3 POLE, H.G. FUSE .			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Maker's name and country or origin		
2	Suitable for mounting	Horizontal only.	
3	Number of supporting post insulator per phase	2 nos. 12KV Post Insulator per phase as per ISS -2544/ 1973	
4	Post Insulator		
(a)	Maker's name and country or orgin	To be specified by the tenderer.	
(b)	Type of cementing	To be quoted original cemented only.	
(c)	One minute power frequency withstand voltage dry	28 KV RMS	
(d)	One minute power frequency withstand voltage wet.	28 KV RMS	

(e)	Visible discharge voltage	9KV RMS	
(f)	Dry Flashover Voltage	To be specified by the tenderer.	
(g)	Power frequency puncture withstand voltage	1.3 times of actual dry flash over voltage.	
(h)	Impulse withstand voltage(Switching Position)	75KV (peak)	
(I)	Creepage distance	380mm minimum. (actual creepage distance for which type test have been conducted is to be specified by the bidder)	
5	Impulse withstand voltage for positive and negative polarity (1.2/50 micro second wave)		
(a)	Across the isolating distance	85KV (peak)	
(b)	To earth & between poles	75 KV (peak)	
6	One minute power frequency withstand voltage		
(a)	Across the isolating distance	32 KV (RMS)	
(b)	To earth & between poles	28 KV (RMS)	

7	Rated normal current and rated frequency.	200 amps, 50 Hz , 3 Pole	
8	Operating Voltage	11 KV	
9	Vertical clearance from top of insulator cap to mounting Channel	254 mm (minimum)	
10	Height of the riser for carrying the horns.	150mm from the cap (top) of insulator.	
11	Details of Arcing Horns	Copper rod having 7.62 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper casting. (Total length 635mm). All the bolts, nuts and washers should be made out of brass.	

12	Riser Unit (250mm total height).	(a) The shape of connectors may be made of straight copper Flat of size adequate enough to carry a current density not less than 1.5 Amp/ mm^2. 2 Nos of 3/8" G.I. Bolts, double nuts, plain and spring washers and 2 nos. solder less bimetallic shockets per each connector suitable up to 100 mm^2 AAA conductor.	
		(b) 100mm height G.I. Riser made of 19mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 30 x 5 mm at both ends fixed with 10mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13	Supporting Channels	75 x 40 x 6 mm M.S. Channel (galvanized)	
14	Galvanisation	All ferrous parts should be galvanized as per IS-2633/1972 & all non-ferrous part should be duly electroplated with silver.	
15	Weight of each pole (complete)	To be specified by the tenderer.	

GTP NO- 14 GURANTEED TECHNICAL PARTICULARS OF ISOLATOR(33kV)			
Sl.No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Main switch	Double end break Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operator	
5	Rated voltage nominal/ Maximum	33/36 kV	
6	Rated Frequency	50 Hz (+5% to -3%)	
7	System earthing	Effectively earthed	
8	Temperature rise	As per relevant IS/IEC publication	
9	Insulation level impulse with stand voltage		
	a) Across Isolating distance	195 kVpeak	

	b) To earth & between poles	170 kVpeak	
10	1 minute power frequency withstand voltage		
	a) Across Isolating distance	80 kVpeak	
	b) To earth & between poles	70 kVpeak	
11	Rated current in Amp	1250	
12	Short time current for 3 sec	25kA	
13	Operating mechanism	Motorised	
14	Auxiliary voltage	33kV	
	a) Control & Inter lock	48 DC 80% to 110%	
15	Safe duration of overload		

	a)150% of rated current	5 minute	
	b)120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	900mm	
	i) Mounting structure	Upright on G.I structure	
	ii) Terminal connector type	Bimetallic clamp	
	iii) Control	Local	

GTP NO- 15	GURANTEED TECHNICAL PARTICULARS OF ISOLATOR(11kV)		
Sl.No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Main switch	Double end break Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operated	
5	Rated voltage nominal/ Maximum	11/12 kV	
6	Rated Frequency	50 Hz (+5% to -3%)	
7	System earthing	Effectively earthed	
8	Temperature rise	As per relevant IS/IEC publication	
9	Insulation level impulse with stand voltage		

	a) Across Isolating distance	85 kV peak	
	b) To earth & between poles	75 kVpeak	
10	1 minute power frequency withstand voltage		
	a) Across Isolating distance	32 kVpeak	
	b) To earth & between poles	28 kVpeak	
11	Rated current in Amp	1250	
12	Short time current for 3 sec	25kA	
13	Operating mechanism	Manual	
14	Auxiliary voltage	11kV	
	a) Control & Inter lock	48 DC 80% to 110%	

15	Safe duration of overload		
	a)150% of rated current	5 minute	
	b)120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	380 mm	
	i) Mounting structure	Upright on G.I structure	
	ii) Terminal connector type	Bimetallic clamp size	
	iii) Control	Local	

GTP NO-16 GUARANTEED TECHNICAL PARTICULARS FOR 33kV, 200A/400A, 50 Hz AB SWITCH, 3 POLE, SINGLE BREAK TYPE			
Sl. No	**Name of the Particulars**	**Desired value**	**Bidder's offer**
1	Maker's name and country of origin	To be specified by the tenderer	
2	Type of Switch	Rotating type only	
3	Suitable for mounting	Horizontal only	
4	Number of supporting Post Insulators per phase	4 nos.(22kV / 24kV Post Insulators per phase as per ISS-2544/1 973)	
5	Post Insulator.		
a)	Maker's name and country of origin	To be specified by the tenderer	
c)	Type of cementing	To be quoted for original cemented only & as per IS-2544-1 973 & relevant IEC.	

d)	One minute power frequency withstand voltage Dry	95kV rms.	
e)	One minute power frequency withstand voltage Wet	75kV rms.	
f)	Visible discharge voltage	27kV rms.	
g)	Dry Flash Over Voltage	125 kV	
g)	Power frequency puncture with stand voltage	1.3 times of actual dry flash over voltage	
h)	Impulse withstand voltage (switch in position)	170kV(peak)	
i)	Creepage distance (mm)	380mm minimum. (actual Creepage distance for which type test have been conducted is to be specified by the tenderer)	

6	Impulse withstand voltage for positive and negative polarity 1.2 / 50 mircro-second wave		
a)	Across the isolating distance	195kV(peak)	
b)	To earth & between poles	170kV(peak)	
7	One minute power frequency withstand voltage		
a)	Across the isolating distance	80kV(rms)	
b)	To earth & between poles	70kV(rms)	
8	Rated normal current and rated frequency	200 Amp/ 400 Amp 50 Hz	
9	Rated short time current. for 3 sec	25kA (rms)	
10	Rated short circuit making capacity	62.5kA (rms)	

11	Rated peak withstand current	40kA(Peak)	
12	Rated cable charging breaking capacity	16A (rms)	
13	Rated Transformer off load breaking capacity	16 Amp(rms)	
14	Rated line charging breaking capacity	16Amp(rms)	
15	Minimum clearance between adjacent phases		
a)	Switch Closed (centre to centre)	1200 mm	
b)	Switch Opened (centre to edge of blade)	640 mm	
16	Temperature rise		

a)	Temperature rise shall not exceed the maximum limit as specified below at an ambient temperature not exceeding in	40° C	
b)	Copper contacts in air	65^0C	
c)	Terminal of switch intended to be connected to external conductor by bolts	50^0C	
17	Vertical Clearance from top of insulator cap to mounting channel	508 mm (minimum)	
18	Type of Contact: -	a) Self aligned, high pressure jaw type fixed contacts of electrolytic copper of size 80 mm x 50 mm x 8 mm duly silver plated. Each contact should be revetted with three nos. Copper rivets with a bunch (minimum 3 mm thick) consisting of copper foils, each may vary from 0.15 mm to 0.25 mm. These total thickness of copper foils per jaw should be 6 mm. Jaw assemblies are to be bolted through stainless steel bolts and nuts with stainless steel flat and spring washer.	
		b) Solid rectangular blade type moving contact of electrolytic copper size 250 mm x 50 mm x 8 mm duly silver plated ensuring a minimum deposit of 10 micron of silver on copper contacts or as may be prescribed under relevant ISS / IEC.	

		c) Pressure spring to be used in jaw contacts shall be Stainless Steel having 8 nos of turn x 28 mm height x 14.4 mm diameter with 14 SWG wire (minimum six nos springs shall be used)	
19	Connectors:-	Terminal connectors for both movable and fixed should be of copper flats of same size similar to that of moving contact blades (minimum 95% copper composition). The fixed connector shall of size 80 mm x 50 x 8 mm and the size of movable connector shall be size 80 x 50 x 8 mm with machine finishing duly silver plated with 2 nos. of 3/8" stainless steel bolts, nuts, plain washers & spring washers should be provided along with 2 nos solder less bimetallic sockets for each connector suitable sockets for each connector suitable up to 232 mm^2 AAA Conductor.	
20	Moving Contacts:-	Movable contact is to be supported by galvanized angle of 50 x 50 x 5 mm in each phase and the moving contact are to be bolted through 2 no stainless steel bolts and nuts with suitable stainless steel flat and spring washers.	
21	Galvanization	a) Iron parts shall be dip galvanized as per IS- 2633/1972.	
		b) The pipe shall be galvanized as per 4736/1968.	
22	Details of Phase		
a)	Coupling Rod	25 mm nominal bore G.I. pipe medium gauge.	

b)	Operating Rod	32 mm nominal bore G.I. pipe medium gauge single length 6 mtrs. The detailed dimension of the G. I. pipe as per IS-1239 (Pt. I) as mentioned					
		Nominal base (mm)	Outside diameter (mm)	Diameter thickness (mm)	base Nominal (mm)	Outside diameter (mm) Page	Diameter thickness (mm) No 5 of 7 / 33kV AB SWITCH
			Max	Min	Max	Min	
		25	34.2	3.25			
		32	42.9	3.25			
c)	Arcing Horns	10 mm dia G.I. rod with spring assisted operation.					
d)	Force of Fixed contact spring	To be specified by the tenderer.					
e)	Copper braided flexible tapes:-	450 mm length of flexible electrolytic copper tape or braided chord (with tin coated) having minimum weight 450 gms per meter and both ends shall be					
f)	Quick break device	Lever mechanism.					
g)	Bearings	4 nos. self lubricated bearing to be provided with grease nipple including 4th bearing being a thrust bearing.					

h)	Locking arrangement	Pad Lock & Key arrangement at both 'ON' & 'OFF' position.	
i)	Earth Terminal:	To be provided at base channels.	
23	Supporting Channels	100 mm x 50 mm M.S. Channel hot galvanized.	
24	Weight of each pole complete	To be specified by the tender	

GTP NO-17 GUARANTEED TECHNICAL PARTICULARS FOR 11kV, 200A, 50 Hz AB SWITCH, 3 POLE, SINGLE BREAK TYPE BRAKE TYPE			
Sl. No	**Name of the Particulars**	**Desired value**	**Bidder's offer**
1	Maker's name and country of origin	To be specified by the tenderer	
2	Type of Switch	Rotating type only	
3	Suitable for mounting	Horizontal only	
4	Number of supporting Post Insulators per phase	2 nos. (12 kV Post Insulators per phase as per ISS-2544/1973)	
5	Post Insulator.		
a)	Maker's name and country of origin	To be specified by the tenderer	
b)	Type of cementing	To be quoted for original cemented only & as per IS-2544-1973 & relevant IEC.	
c)	One minute power frequency withstand voltage Dry	35kV rms.	

d)	One minute power frequency withstand voltage Wet	35kV rms.	
e)	Visible discharge voltage	9kV rms.	
f)	Dry Flash Over Voltage	55 kV	
g)	Power frequency puncture with stand voltage	1.3 times of actual dry flash over voltage	
h)	Impulse withstand voltage (switch in position)		
i)	Creepage distance (mm)	330 mm minimum. (actual Creepage distance for which type test have been conducted is to be specified by the tenderer)	
6	Impulse withstand voltage for positive and negative polarity 1.2 / 50 mircro-second wave		
a)	Across the isolating distance	85kV(peak)	
b)	To earth & between poles	75kV(peak)	

7	One minute power frequency withstand voltage		
a)	Across the isolating distance	32kV(rms)	
b)	To earth & between poles	28kV(rms)	
8	Rated normal current and rated frequency	200 Amp 50 Hz	
9	Rated short time current.	16kA(rms)	
10	Rated short circuit making capacity	25kA(rms)	
11	Rated peak withstand current	40kA(Peak)	
12	Rated cable charging breaking capacity	10kA(rms)	

13	Rated Transformer off load breaking capacity	6.3 Amp(rms)	
14	Rated line charging breaking capacity	2.5 Amp(rms)	
15	Minimum clearance between adjacent phases		
a)	Switch Closed (centre to centre)	760 mm	
b)	Switch Opened (centre to edge of blade)	380 mm	
16	Temperature rise		
a)	Temperature rise shall not exceed the maximum limit as specified below at an ambient temperature not exceeding in	40^0C	
b)	Copper contacts in Silver Plated	65^0C	

c)	Terminal of switch intended to be connected to external conductor by bolts	50^0C	
17	Vertical Clearance from top of insulator cap to mounting channel	254 mm (minimum)	
18	Type of Contact: -	a) Self aligned, high pressure jaw type fixed contacts of electrolytic copper of size 80 mm x 50 mm x 8 mm duly silver plated. Each contact should be revetted with three nos. Copper rivets with a bunch (minimum 3 mm thick) consisting of copper foils, each may vary from 0.15 mm to 0.25 mm. These total thickness of copper foils per jaw should be 6 mm. Jaw assemblies are to be bolted through stainless steel bolts and nuts with stainless steel flat and spring washer.	
		b) Solid rectangular blade type moving contact electrolytic copper size 220 mm x 50 mm x 8 mm duly silver plated ensuring a minimum deposit of 10 micron of silver on copper contacts or as may be prescribed under relevant ISS / IEC.	
		c) Pressure spring to be used in jaw contacts shall be Stainless Steel having 8 nos of turn x 28 mm height x 14.4 mm diameter with 14 SWG wire (minimum six nos springs shall be used)	

19	Connectors:-	Terminal connectors for both movable and fixed should be of copper flats of same size similar to that of moving contact blades (minimum 95% copper composition). The fixed connector shall of size 80 mm x 50mm x 8 mm and the size of movable connector shall be size (80 x 50) x(80x50)x 8 mm with machine finishing duly silver plated with 2 nos. of 12mm dia. hole with suitable brass & double nuts with brass flat washers and 2nos solderlss bimetallic sockets per each connector suitable 80 mm^2 AAA Conductor.	
20	Moving Contacts:-	Movable contact is to be supported by galvanized angle of 50 x 50 x 5 mm in each phase and the moving contact are to be bolted through 2 no stainless steel bolts and nuts with suitable stainless steel flat and spring washers.	
21	Galvanization	a) Iron parts shall be dip galvanized as per IS-2633/1972.	
		b) The pipe shall be galvanized as per IS-4736/1 968.	
22	Details of Phase		

a)	Coupling Rod	25 mm nominal bore G.I. pipe medium gauge.	
b)	Operating Rod	32 mm nominal bore G.I. pipe medium gauge single length 6 mtrs. The detailed dimension of the G. I. pipe as per IS-1 239 (Pt. I) as mentioned below :-	
c)	Arcing Horns	8 mm dia G.I. rod with spring assisted operation.	
d)	Force of Fixed contact spring	To be specified by the tenderer.	
e)	Copper braided flexible tapes:-	320 mm length of flexible electrolytic copper tape or braided chord (with tin coated) having minimum weight 450 gms per meter and both ends shall be crimped with copper sockets through brass bolts and nuts with brass flat washers. Two nos of suitable copper sockets shall be used at both ends. The minimum no. of flexible wires should be 1536 of 36 SWG for each flexible chord.	
f)	Quick break device	Lever mechanism.	

g)	Bearings	4 nos. self lubricated bearing to be provided with grease nipple including 4th bearing being a thrust bearing.			
h)	Locking arrangement	Pad Lock & Key arrangement at both ‘ON’ & ‘OFF’ position.			
i)	Earth Terminal:	To be provided at base channels.			
j)	T connection	The T connection provided on the channel having moving contact shall be of G.I Nut & bolt at the bottom end to facilitate replacement of this unit only during requirements & avoid entire change of the arm			
k)	I Bolt	The I bolt shall be longer with 75mm thread			
23	Supporting Channels	100 mm x 50 mm M.S. Channel hot dip galvanized.			
24	Weight of each pole complete	To be specified by the tender			

GTP NO-18 GUARANTEED TECHNICAL PARTICULARS FOR 100 mm2 AAAC			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's offer**
1	Make		
2	No. of strands	7	
3	Wire dia in mm.:		
a)	Nominal	4.26	
b)	Minimum	4.22	
c)	Maximum	4.3	
4	Approximate overall dia of the conductor in mm. Cross-sectional area of:	12.78	
5.a)	Individual wire in mm^2	14.25	
b)	Stranded conductor in mm^2	99.81	
6.a)	Approx Mass of :		
b)	Individual wire in Kg/Km	38.48	

c)	Stranded Conductor in Kg/Km	272.86	
7.a)	Minimum breaking load in KN		
b)	Individual wire	4.18	
c)	Conductor (U.T.S.)	29.26	
8.a)	Calculated maximum DC resistance at 20 ^{0}C in Ohm/ Km		
b)	Individual wire	2.345	
c)	Conductor	0.339	
9	Lay ratio for 7 wire conductor	Min : 10, Maxm : 14	
10	Direction of Lay	Right handed	

11	Modulus of Elasticity (Kg/ cm^2)	0.6324×10^6	
12	Co-efficient of linear expansion per ^{0} C	23.0×10^{-6}	
13	Standard length (Mtr.)	2000 ± 5%	
14	Size of drum in mm.		
15	No. of lengths in one drum		
16	No. of cold pressure butt welding		

GTP NO-19 GUARANTEED TECHNICAL PARTICULARS FOR 148 mm2 AAAC			
Sl.No	**Name of the Particulars**	**Desired Value**	**Bidder's offer**
1	Make		
2	No. of strands	7	
3	Wire dia in mm.:		
a)	Nominal	3.15	
b)	Minimum	3.12	
c)	Maximum	3.18	
4	Approximate overall dia of the conductor in mm. Cross-sectional area of:	15.75	
5.a)	Individual wire in mm^2	7.793	
b)	Stranded conductor in mm^2	148	
6.a)	Approx Mass of :		
b)	Individual wire in Kg/Km	21.04	
c)	Stranded Conductor in Kg/Km	406.91	
7.a)	Minimum breaking load in KN		
b)	Individual wire	2.289	
c)	Conductor (U.T.S.)	43.5	
8.a)	Calculated maximum DC resistance at 20 ^{0}C in Ohm/ Km		
b)	Individual wire	4.351	
c)	Conductor	0.229	
9	Lay ratio for 7 wire conductor	Min : 10, Maxm : 16	
10	Direction of Lay	Right handed	
11	Modulus of Elasticity (Kg/ cm^2)	0.6324 x 106	

12	Co-efficient of linear expansion per ^{0} C	23.0 x 10 -6	
13	Standard length (Mtr.)	2000 ± 5%	
14	Size of drum in mm.	To be offered by the bidder	
15	No. of lengths in one drum	To be offered by the bidder	
16	No. of cold pressure butt welding		

GTP NO-20 Guaranteed Technical Particulars of 33kV INSULATOR PIN TYPE			
Sl No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Type	Confirming to IEC 273 (solid core)	
3	Voltage class (kV)	36	
4	Dry and wet one minute withstand voltage (kV rms)	70	
5	Dry lightning impulse withstand voltage (kV p)	170	
6	Wet switching surge withstand voltage (kV p)	NA	
7	Max. RIV at corona extinction voltage (micro volts)	NA	
8	Corona extinction voltage (kV rms)		
9	Total minimum cantilever strength (kg)	Not < 300	
10	Minimum torsion moment	As per IEC 273	

11	Total height of insulator (mm)	508	
12	Minimum PCD (mm) top/bottom	76	
13	No. of bolts top/bottom	04- 08	
14	Diameter of Bolts Hole (mm) top /Bottom	M12	
15	Pollution level as per IEC 815	Heavy/Moderately polluted	
16	Minimum total creepage distance (mm)	840 mm in coastal districts and industrial polluted area as detailed in the technical specification and 580 mm in other areas	

GTP NO- 21 Guaranteed Technical Particulars of 11kV INSULATOR PIN TYPE			
Sl No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Type	Confirming to IEC 273 (solid core)	
3	Voltage class (kV)	12	
4	Dry and wet one minute withstand voltage (kV rms)	28	
5	Dry lightning impulse withstand voltage (kV p)	75	
6	Wet switching surge withstand voltage (kV p)	NA	
7	Max. RIV at corona extinction voltage (micro volts)	NA	
8	Corona extinction voltage (kV rms)		
9	Total minimum cantilever strength (kg)	Not < 300	
10	Minimum torsion moment	As per IEC 273	
11	Total height of insulator (mm)	254	
12	Minimum PCD (mm) top/bottom	57	
13	No. of bolts top/bottom	04- 08	
14	Diameter of Bolt holes (mm) top/ Bottom	M12	
15	Pollution level as per IEC 815	Heavy	
16	Minimum total creepage distance (mm)	300	

GTP NO-22 GUARENTEED TECHNICAL PARTICULARS FOR METAL OXIDE (GAPLESS) 33kV SURGE ARRESTERS			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Nominal system voltage (phase to phase) (KV rms).	33	
3.a)	Highest system voltage (phase to phase) (KV rms).	36	
4	System Frequency (HZ).	50 ±5%	
5	System Neutral earthing.	Effectively earthed	
6	Installation.	Outdoor	
7	Class.	Station class, 10 KA, heavy duty type.	
8	Type of construction for 10 KA rated arrester.	Single column, single phase	
9	No. of phases.	Three	
10	Maximum duration of earth fault (Sec.)	3	
11	Maximum prospective symmetrical fault current at arrester location	40	
12	Rated arrester voltage (KV rms)	30	
1 3.a)	Nominal discharge current (KAP)	10 KA of 8/20 µsec Wave.	

	b) Discharge current at which insulation co-ordination will be done		
14	Minimum energy discharge capability (KJ/KV)	As per relevant ISS/IEC	
15	Maximum continuous operating voltage at 50º C (KV rms)	25	
16	Maximum switching surge residual voltage (KVP)	72 at 500A	
17	Maximum residual voltage at 8/20 micro second(KVP)		
(i)	5KA.	85	
(ii)	10 KA Nominal discharge current.	90	
(iii)	20 KA.	100	
18	Long duration discharge class	3	
19	High current short duration test value (KAP) (4/10 Micro-second wave).	100	
20	Current for pressure relief test (KA-rms)	40	
21	Minimum total creepage distance (mm).	900	
22	One minute dry and wet power frequency withstand voltage of Arrester housing (KV-rms).	70	

23 (a)	Impulse withstand voltage of arrester housing with 1.2/ 50 micro-second wave (KVP).	110.5	
b)	Switching Impulse Voltage (Wet) (KVP)		
24	Pressure relief class.	A	
25	Corona extinction voltage (KV-rms).	-	
26	RIV at 92 KV rms.	Less than 500 micro volts	
27	Partial discharge at 1.05 times continuous over-voltage.	Nor more than 50 PC	
28	Seismic acceleration.	0.3g horizontal 0.15g vertical	
29	Reference ambient temperature.	50ºC	
30.(a)	IR at MCOV.	Less than 400 micro amperes	
b)	IC at MCOV.	Less than 1200 micro amperes	
31.a)	Reference Current (mA)	1 to 5 mA	
b)	Reference voltage at reference current.	Greater than rated voltage.	

32	Maximum steep current Impulse RDV (KVP). at KAP	100	
33	Maximum cantilever strength of the arresters (KGM).	325	
34	TOV(KVP).		
(i)	0.1 sec.	53	
(ii)	1.0 sec.	51	
(iii)	10.0 sec.	49	
(iv)	100.0 sec.	47	

GTP NO-23 Guaranteed Technical Particulars Of 11 kV Surge Arrestors			
Sl. No	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Make	To be Specified by Bidder	
2	Nominal system voltage (phase to phase) (KV rms).	11	
3	Highest system voltage (phase to phase) (KV rms).	12	
4	System Frequency (HZ).	50 (+5% to -3%)	
5	System Neutral earthing.	Effectively earthed	
6	Installation.	Outdoor	
7	Class.	5 KA.	
8	Type of construction for 5 KA rated arrester.	Single column, single phase	
9	No. of phases.	Three	
10	Maximum duration of earth fault (Sec.)	3	
11	Maximum prospective symmetrical fault current at arrester location (KA rms)	40	
12	Rated arrester voltage (KV rms)	9	
13	Nominal discharge current (KAP)	5 KA of 8/20 µsec Wave.	
14	Minimum energy discharge capability (KJ/KV)	As per relevant ISS/IEC	
15	Maximum continuous operating voltage at 50º C (KV rms)	9.6	
16	Maximum switching surge residual voltage (KVP)	28	
17	Maximum residual voltage at 8/20 micro second(KVP)		

(i)	5 KA.	32	
18	High current short duration test value (KAP) (4/10 Micro-second wave).	100	
19	Current for pressure relief test (KA-rms)	40	
20	Minimum total creepage distance (mm).	380	
21	One minute dry and wet power frequency withstand voltage of Arrester housing (KV-rms).	28	
22	Impulse withstand voltage of arrester housing with 1.2/ 50 micro-second wave (KVP).Switching Impulse Voltage (Wet) (KVP)	41.6	
23	Pressure relief class.	A	
24	Corona extinction voltage (KV-rms).	-	
25	RIV at 92 KV rms.	Less than 500 micro volts	
26	Partial discharge at 1.05 times continuous over voltage.	Not more than 50 PC	
27	Seismic acceleration.	0.3g horizontal 0.15g vertical	
28	Reference ambient temperature.	50ºC	
29. (a)	IR at MCOV.	Less than 400 micro amperes	

(b)	IC at MCOV.	Less than 1200 micro amperes	
30. (a)	Reference Current (mA)	1 to 5 mA	
(b)	Reference voltage at reference current.	Greater than rated voltage.	
31	Maximum steep current Impulse RDV (KVP). at KAP	100	
32	Maximum cantilever strength of the arresters (KGM).	325	
33	TOV (KVP).		
(i)	0.1 sec.	20	
(ii)	1.0 sec.	18	
(iii)	10.0 sec.	16	
(iv)	100.0 sec.	14	

GTP NO – 24 GUARANTEED TECHNICAL PARTICULARS FOR NUMERICAL RELAY			
Sl No	**Name of the Particulars**		**Bidder's Offer**
1	Manufacturer's Name and country of origin		
2	Manufacturer's design Ref / Type		
3	Applicable Standards		
4	Current setting range for		
	(a)Over current relay	IDMTL Instantaneous	
	(b)Earth-fault relay	IDMTL Instantaneous	
	(c)Contact Rating		
5	Details on IDMTL characteristics		
6	Whether High Set is Transient free		
7	Whether separate Time setting for IDMTL / Instantaneous Elements available		
8	Whether Relay senses True RMS Current		
9	Accuracy for different settings and limits of errors		
10	Whether settings site selectable and HMI provided		
11	Whether Alpha Numeric LED display		
12	Whether Compatible for 48 V DC		

13	Whether Compatible for 1 A CT Secondary	
14	Whether Self diagnostic features available	
15	Whether Communication IEC 61850	
16	Whether Blocking characteristics available for blocking the unscrupulous tripping of Upstream Breakers	
17	(a)Whether relay test block is provided	
	(b)Type of test block with literature	
18	Whether draw out type unit	
19	Types of case	
20	Reset time	
21	Burden of relay	

GTP NO-25 GUARANTEED TECHNICAL PARTICULARS FOR 33/0.11 kV INDUCTIVE VOLTAGE TRANSFORMERS			
Sl. No	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
1 2	Type Nominal system voltage.	Singlephase,50Hz,oil filled, self cooled, Hermetically sealed, outdoor porcelain type 33KV.	
3	Highest system voltage.	36KV	
4	Frequency.		
5	System earthing.	Effectively solidly earthed	
6	Number of phases.	3 [single phase]	
7	(i)Number of secondary windings. (ii)Purpose of windings.	2 (two) one protection and one Metering)	
8	Rated primary voltage.	33/1.732KV	

9	Rated secondary voltage.	110/1.732V (Metering) 110/1.732V Protection	
10	Ratio	33KV/1 .732/ 110/1 .732	
11	Rated burden.	Winding-I(P)- 15VA Winding-II(M)- 15 VA	
12	Accuracy class .	3P & 0.2	
13	Rated voltage factor at rated frequency.	1.2 continuous. 1.5 for 30 seconds	
14	Temperature rise at 1.2 times the rated primary voltage, rated frequency & rated	As per IEC-186.	
15	Temperature rise at 1.5 times the rated primary voltage for 30 seconds, rated frequency &rated	As per IEC-186	
16	One-minute power frequency dry withstands test voltage for primary winding.	70KV (rms)	
17	1-minute power frequency wet withstands test voltage for primary winding.	70KV (rms)	

18	1.2/50 microsecond impulse withstandtest voltage for primary winding	170KV (peak)	
20	One-minute power frequency withstands test voltage for Secondary winding Between LV(HF) terminal & earth terminal Class of insulation.	3 KV (rms) 'A'	
21	Material of the conductor of primary and secondary windings.	Copper	
22	Fault level of the bus to which PTs will be connected.	25KA for 3 second.	
23	Minimum creepage distance.	900mm	
24	Quality of oil.	EHV Grade As per IS-335	
25	Radio interference voltage at 1.1 times maximum rated voltage at 1.0 MHZ.	Less than 500 micro volts	
26	Partial discharge level.	Nor more than 50 PC	

27	Seismic acceleration- Horizontal – Vertical.	0.3g. 0.15g.	
28	Accuracy class of standard V.T. to be used during testing towards determination of ratio errors and phase angle errors for metering windings.	0.05 or better.	
29	Capacitance (Pf)	-	

GTP NO-26 GUARANTEED TECHNICAL PARTICULARS FOR 11/0.11 kV INDUCTIVE VOLTAGE TRANSFORMERS			
Sl. No	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
1	Type	Singlephase,50Hz,oil filled, self cooled, Hermeticallysealed, outdoor porcelain type	
2	Nominal system voltage.	11KV.	
3	Highest system voltage.	12 KV	
4	Frequency.		
5	System earthing.	Effectively solidly earthed	
6	Number of phases.	3 [single phase]	
7	(i)Number of secondary windings.	2 (two) one protection and one Metering)	
	(ii)Purpose of windings.		
8	Rated primary voltage.	11/1.732KV	
9	Rated secondary voltage.	110/1.732V (Metering)	
		110/1 .732V	
		Protection	

10	Ratio	11KV/1 .732/	
		110/1 .732	
11	Rated burden.	Winding-I(P)-15VA	
		Winding-II(M)- 15VA	
12	Accuracy class .	3P and 0.2	
13	Rated voltage factor	1.2 continuous.	
	at rated frequency.	1.5 for 30 seconds	
14	Temperaturerise at 1.2 times the rated primary voltage, rated frequency & rated burdens.	As per IEC-186.	
15	Temperature riseat 1.5 times the ratedprimary voltagefor 30seconds, rated frequency &rated	As per IEC-186	
16	One-minute power frequency dry withstands test voltage for primary winding.	28KV (rms)	
17	1.2/50 microsecond impulse withstandtest voltage for primary winding	75KV (peak)	

18	One-minute power frequency withstands test voltage for Secondary winding	3 KV (rms)	
(i)	Between LV(HF) terminal & earth terminal	3 KV (rms)	
20	Class of insulation.	'A'	
21	Material of the conductor of primary and secondary windings.	Copper	
22	Fault level of the bus to which PTs will be connected.	25KA for 3 second	
23	Minimum creepage distance.	320mm	
24	Quality of oil.	EHV Grade	
		As per IS-335	
25	Radio interference voltage at 1.1 times maximum rated voltage at 1.0 MHZ.	Less than 500 micro volt	
26	Partial discharge level.	Not more than 50 PC	
27	Seismic acceleration- Horizontal – Vertical.	0.3g.	
		0.15g.	

28	Accuracy class of standard V.T. to be used during testing towards determination of ratio errors and phase angle errors for metering windings.	0.05 or better.	

GTP NO 27 GURANTEED TECHNICAL PARTICULARS OF 33 KV & 11 kV V-CROSS ARM				
Sl. No.	**Name of the Particulars**	**Unit**	**33kV**	**11kV**
1	Type of crossarm			
2	Grade of steel			
3	Steel standard			
4	Fabrication Standard			
5	Dimensions	Mm		
6	Steel section utilized			
7	Steel tensile strength	N/cm^2		
8	Working load	Kg		
9	Details of Galvanising Methods utilized and Standard/Specification			
10	Weight of cross arm	kg		
11	Whether drawing has been submitted with the bid			

GTP NO- 28 GURANTEED TECHNICAL PARTICULARS OF HT STAY SET					
Sl NO	**Name of the Particulars**	**Specified Parameters**			**Bidder's Offer**
		Section Tolerances	**Fabrication Tolerances**	**Material**	
1	Anchor Plate	8mm thick+2.5%-5%	300x300mm+1%	5 GI Plate 8 mm thick	
2	Anchor Rod	20mm dia +3%-2%	Length 1800mm +0.5% Round Eye 40mm inside dia + 3%. Threading 40mm =11 %-5%	GI Round 20mm dia	
3	Turn Buckle Bow	16mm dia +5%-3%	Length180mm +1% 50x50x6mm Channel length 200mm + 1%	GI Round 16mm dia. GI Angle GI Channel 100x50x4.7mm	
4	Eye Bolt Rod	20mm dia + 3% - 2%	Length450mm +1 %Threading 300mm +1% Round Eye 40 mm inside dia +3%	GI Round 20mm dia.	

GTP NO- 29 GURANTEED TECHNICAL PARTICULARS of STAY WIRE (7/10 SWG)			
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Nominal diameter of wire	4.87m m	
2	Tolerance in diameter	+/- 2.50%	
3	Sectional Area (In Sq. mm.)	18.63	
4	Tensile strength	925kgf	
6	Type of coating Heavy/Medium/Light	Heavy	
8	Weight of Zinc coating (Gms/ Mtr.) Min.	3	
9	No of dips the coating withstand as 18 ± 20ºC 1 min	3	

11	Tensile test : Tension strength in MPA	550 TO 900	
12	Ductility Test : Condition of wire after wrapping test as per ISS 175/1 961	When wrapped 8 times round its own diameter and on being straigthened the wire shall not split	
13	Lenghth of wire in each coil in meter	408	
13 a	Tolerance%	+/- 5%	
14	Weight of each coil in Kgs	70 to 100	
14 a	Tolerance%	+/- 5%	
15	Weight of wire in Kg/Km	146	
15 a	Tolerance%	+/- 5%	
16	Standard according to which the solid wire is manufactured and tested	ISS 280/78	
17	Details of packing	By G.I Wire	

GTP N0 -30 GURANTEED TECHNICAL PARTICULARS OF TENSION CLAMP			
Sl. No.	**Name of the Particulars**	**Desired Value (Suitable for AAAC 148/100mm^2)**	**Bidders Offer**
1	Type	Compression type tention clamp	
2	Material	Ext. Al.Alloy/Ext. Al.	
3	Breaking Strenght	95% of UTS of Conductor	
4	Slipping Strenght	95% of UTS of Conductor	
5	Galvanising		
a	Ferrous Parts	Hot Dip Galvanised	
b	Spring Washers	Electro Galvanised	
6	Quality of Zinc used	99.95 %	
7	Number of dips which the clamp can withstand	6/ 1 minute dips	
8	Standard to which Conforming	IS 2633	
9	Electrical conductivity		
a.	Results of heating cycle test carried out	T.C. Attached	
b.	Electrical resistance	Not more than 75% of equivalent length of conductor	
10	Reference to type tests and other test reports attached	T.C. Attached	
11	Make of bolts and Nuts used		

GTP N0 -31 GURANTEED TECHNICAL PARTICULARS OF SUSPENSION CLAMP			
Sl. No.	**Name of the Particulars**	**Desired Value (Suitable for AAAC 148/100mm^2)**	**Bidders Offer**
1	Type of material used for retaining rod for AGS assembly giving reference of ISS	Aluminum Alloy 6061/Equivalent	
2	Minimum tensile strength of retaining rod material	35 Kg/mm2	
3	Chemical composition of retaining rod materials	As per IS:733	
4	Electrical conductivity of Armour Rod material(In percentage of the conductivity of IACS i.e. International Annealed Copper Standard	Not less than 40 %of IACS	
5	Slipping strength of cushioned suspension assembly	8% to 15% of UTS of Conductor	
6	Breaking strength of suspension Clamp	6000 Kgf	
7	Minimum Tensile Strength	2000 Psi	
8	Minimum ultimate Elongation	300 %	
9	Ageing (guaranteed life of the assembly)	40 Years	
10	Hardness	65 to 80 A	

GTP N0 -32 GURANTEED TECHNICAL PARTICULARS OF BACK CLAMP			
Sl. No.	Name of the Particulars	Unit	Bidder's Offer
1	Type of Clamp		
2	Grade of steel		
3	Steel standard		
4	Fabrication Standard		
5	Dimensions	Mm	
6	Steel section utilized		
7	Steel tensile strength	N/cm^2	
8	Working load	Kg	
9	Details of galvanizing method Utilized and Standard/specification conforming to		
10	Weight of back clamp	kg	
11	Whether drawing has been submitted with the bid		

GTP N0 -33	GUARANTEED TECHNICAL PARTICULARS OF FLEXIBLE COPPER BOND		
Sl. No.	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
1	Stranding	37/ 7/ 0.417	
2	Cross sectional area(Sq.mm)	75.6	
3	Minimum copper equivalent area(sq.mm)	34(each individual wire)	
4	Length of copper cable(mm)	500	
5	Material Lugs	Tinned copper	
6	Bolt Size		
	(i) Diameter(mm)	16	
	(ii) Length(mm)	40	
7	Resistance(ohm)	0.0004(as per IS.2121)	
8	Total weight of Fexible copper bond(kg)	0.45(approx)	

GTP NO- 34 GUARENTEED TECHNICAL PARTICULARS OF Earthing Pipe			
Sl. No	**Name of the Particulars.**	**Desired Value**	**Bidder's Offer**
		Multiplication Factor to Resistivity	
1	Length (mm)2000	0.21	
	3000	0.15	
2	Short Time Current Rating	25kA	
3	Inner Diameter	19mm Rod or 28mm Pipe	
4	Galvanization Range	Between 80 to 100 micro ohms	
5	Inner Space Contains	Heterogeneous Rich Crystalline Mixture	
6	Material	G.I Type	

GTP NO- 35	GURANTEED TECHNICAL PARTICULARS EARTHING COIL		
Sl. No.	**Name of the Particulars**	**Desired Value**	**Bidder's Offer**
1	Nominal diameter of wire	4.00mm (08 swg) with tolerance +/- 2.5%	
2	No. of turns	115nos	
3	External dia of Coil	50mm(min)	
4	Length of Coil	460mm(min)	
5	Mass of Zinc	280gm/ sq mm (before coiling) & 266 gm/sq mm after coiling	
6	Total weight of Coil	1.850kg (min)	
7	General Tolerance	+ / - 2.5 %	

GTP- 36

TECHNICAL SPECIFICATION OF LT THREE & HALF CORE XLPE (120SQMM, 95SQMM & 25SQMM CABLES) IN SUB STATION

Sl. No	Name of the Particulars	3x120 + 70 SQMM	Bidder's Offer	3X95 + 50 sqmm	Bidder's Offer	3X25 + 16 sqmm	Bidder's Offer
1	Type of cable	Aluminium Conductor ,XLPE Insulated		Aluminium Conductor ,XLPE Insulated		Aluminium Conductor ,XLPE Insulated	
2	Conductor Details						
a	No of Cores	3 &1/2		3 &1/2		3 &1/2	
b	Normal Cross-Sectional Area	3x120 + 70 SQMM		3X95 + 50 sqmm		3X25 + 16 sqmm	
c	Material and Grade	Aluminium compacted,Stranded as per IS: 8130 with latest amendment		Aluminium compacted,Stranded as per IS: 8130 with latest amendment		Aluminium compacted,Stranded as per IS: 8130 with latest amendment	
d	Shape of Conductor	Circular		Circular		Circular	
e	Diameter of Conductor	3X12.4 + 9.4 mm		3X11.0 + 8.0 mm		3X5.6 + 4.5 mm	

f	No. of Strands and Diameter of each Strand	as per IS 8130 with latest amendment		as per IS 8130 with latest amendment		as per IS 8130 with latest amendment	
3	Rated Voltage	1.1 kV		1.1 kV		1.1 kV	
4	Maximum Conductor temperature for	90^0 C		90^0 C		90^0 C	
5	Maximum conductor temperature during short circuit	250^0C		250^0C		250^0C	
6	Insulation						
a	Material	XLPE		XLPE		XLPE	
b	Nominal Thickness (Phase/ Neutral)	1.2/ 1.1 mm		1.1/ 1.0 mm		0.9/ 0.7 mm	

7	Vulcanization Process						
a	Curing Method	Dry Curing		Dry Curing		Dry Curing	
b	Cooling Method	Inert Gas		Inert Gas		Inert Gas	
8	Inner Sheath						
a	Material	PVC		PVC		PVC	
b	Thickness of inner sheath (mm)	0.4		0.3		0.3	
c	Diameter of Cable after inner sheath application	Manufacture to Specify		Manufacture to Specify		Manufacture to Specify	

9	Outer Sheath	PVC PVC		PVC PVC		PVC PVC	
a	Type	FR ST 2 as per IS 5831		FR ST 2 as per IS 5831		FR ST 2 as per IS 5831	
b	Colour	Black		Black		Black	
c	Thickness	2.2		2.2		2.0	
10	Nominal OVerall Diameter of Cable	Manufacture to Specify		Manufactur Specify		Manufacture to Specify	
11	Nominal Overall Weight of Cable per Metre	Manufacture to Specify		Manufacture to Specify		Manufacture to Specify	
12	Minimum Bending Radius al during installation	As per Is 1255 / 1983 with latest amendment		As per Is 1255 / 1983		As per Is 1255 / 1983	

13	Short Circuit Current Rating of for 1 Sec	11.28 kA		8.93 KA		2.35 KA	
14	Soil Parameter						
a	Soil Temperature	30°C		30°C		30°C	
b	Ambient Temperature	50°C		50°C		50°C	
c	Soil Thermal Resistivity	150°C Cm/W		150°C Cm/W		150°C Cm/W	
15	Normal current rating in ampere						
a	Groun d	225A		200A		95A	

b	Ducts	185A		165A		80A	
c	Air	258A		221A		99A	
16	Maximum DC Resistance at 20°C ohm/km	0.253		0.320		1.20	
17	Maximum AC Resistance at 90°C ohm/km	0.325		0.411		1.54	
18	Reactance of Cable in in ohm/km	0.072		0.074		0.08	
19	capacitance of cable in micro farad/km	0.29		0.29		0.20	
20	Derating factor of Cable installed	As per IS		As per IS		As per IS	

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TECHNICAL SPECIFICATION OF LT FOUR CORE XLPE 16 SQMM CABLE IN SUB STATION

Sl. No	Name of the Particulars	4x16SQMM	Bidder's Offer
1	Type of cable	Aluminium Conductor ,XLPE Insulated	
2	Conductor Details		
a	No of Cores	4	
b	Normal Cross-Sectional Area	4x16SQMM	
c	Material and Grade	Aluminium compacted,Stranded as per IS: 8130 with latest amendment	
d	Shape of Conductor	Circular	
e	Diameter of Conductor	4X4.5 mm	

f	No. of Strands and Diameter of each Strand	as per IS 8130 with latest amendment	
3	Rated Voltage	1.1 kV	
4	Maximum Conductor temperature for	90^0 C	
5	Maximum conductor temperature during short circuit	250^0C	
6	Insulation		
a	Material	XLPE	
b	Nominal Thickness	0.7 mm	

7	Vulcanization Process		
a	Curing Method	Dry Curing	
b	Cooling Method	Inert Gas	
8	Inner Sheath		
a	Material	PVC	
b	Thickness of inner sheath (mm)	0.3	
c	Diameter of Cable after inner sheath application	Manufacture to Specify	

9	Outer Sheath	PVC	
a	Type	FR ST 2 as per IS 5831	
b	Colour	Black	
c	Thickness	0.3	
10	Nominal OVerall Diameter of Cable	Manufacture to Specify	
11	Nominal Overall Weight of Cable per Metre	Manufacture to Specify	
12	Minimum Bending Radius al during installation	As per Is 1255 / 1983 with latest amendment	

13	Short Circuit Current Rating of for 1 Sec	1.5 kA	
14	Soil Parameter		
a	Soil Temperature	30°C	
b	Ambient Temperature	50°C	
c	Soil Thermal Resistivity	150°C Cm/W	
15	Normal current rating in ampere		
a	Groun d	78A	

b	Ducts	61A	
c	Air	70A	
16	Maximum DC Resistance at 20°C ohm/km	1.91	
17	Maximum AC Resistance at 90°C ohm/km	2.44	
18	Reactance of Cable in in ohm/km	0.080	
19	capacitance of cable in micro farad/km	0.18	
20	Derating factor of Cable installed	As per IS	

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TECHNICAL SPECIFICATION OF LT TWO CORE XLPE 16 SQMM CABLE IN SUB STATION

Sl. No	Name of the Particulars	4x16SQMM	Bidder's Offer
1	Type of cable	Aluminium Conductor ,XLPE Insulated	
2	Conductor Details		
a	No of Cores	2	
b	Normal Cross-Sectional Area	2x16SQMM	
c	Material and Grade	Aluminium compacted,Stranded as per IS: 8130 with latest amendment	
d	Shape of Conductor	Circular	
e	Diameter of Conductor	2X4.5 mm	

f	No. of Strands and Diameter of each Strand	as per IS 8130 with latest amendment	
3	Rated Voltage	1.1 kV	
4	Maximum Conductor temperature for	90^0 C	
5	Maximum conductor temperature during short circuit	250^0C	
6	Insulation		
a	Material	XLPE	
b	Nominal Thickness	0.7 mm	

7	Vulcanization Process		
a	Curing Method	Dry Curing	
b	Cooling Method	Inert Gas	
8	Inner Sheath		
a	Material	PVC	
b	Thickness of inner sheath (mm)	0.3	
c	Diameter of Cable after inner sheath application	Manufacture to Specify	
9	Outer Sheath	PVC	
a	Type	FR ST 2 as per IS 5831	

b	Colour	Black	
c	Thickness	1.8	
10	Nominal OVerall Diameter of Cable	Manufacture to Specify	
11	Nominal Overall Weight of Cable per Metre	Manufacture to Specify	
12	Minimum Bending Radius al during installation	As per Is 1255 / 1983 with latest amendment	
13	Short Circuit Current Rating of for 1 Sec	1.5 kA	
14	Soil Parameter		
a	Soil Temperature	30°C	
b	Ambient Temperature	50°C	
c	Soil Thermal Resistivity	150°C Cm/W	
15	Normal current rating in ampere		

a	Ground	78A	
b	Ducts	61A	
c	Air	70A	
16	Maximum DC Resistance at 20°C ohm/km	1.91	
17	Maximum AC Resistance at 90°C ohm/km	2.44	
18	Reactance of Cable in in ohm/km	0.080	
19	capacitance of cable in micro farad/km	0.18	
20	Derating factor of Cable installed	As per IS	

GTP No. 39 Technical particulars of ACSR – ZEBRA A. ACSR – ZEBRA			
Sl.No.	**ACSR CONDUCTOR:**	**ZEBRA**	**Bidder's Offer**
1	Size of conductor:	54/7/3.18 mm	
2	Stranding and wire diameter		
	Aluminum	54/3.18 mm	
	Steel	7/3.18 mm	
3	Sectional area of Aluminum (in mm2)	428.9	
4	Approximate total mass (in Kgs/KM)	1622	
5	Calculated resistance at 20°C Max.:(in Ohms/Km.)	0.06868	
6	Calculated breaking load of: composite conductor (in KN)	130.32 KN.	
	(U.T.S.) (Min)		
7	Lay Rating :-		
	Steel core	Max- 28	
		Min-13	
	Aluminium Layers		
	12 Wire Layer	Max-17	
	(Innermost Layer)	Min - 10	
	18 Wire Layer	Max - 16	
	(Lay immediately beneath outside Layer:	Min - 10	
	24 wire layer (outside layer)	Max - 14	
		Min - 10	
8	Modulus of elasticity (in Kg / mm2):0.7036 x 106 Kg x CM2	8158	
9	Co-efficient of linear expansion of conductor per degree centigrade.	19.3 x 1 0-6	
10	Standard area of Cross Section in Sq. mm of	484.5 mm2	
11	Diameter of complete conductor in	28.62 mm	

B.Steel and Aluminum Wires				
1	Diameter	Steel	Aluminum	
	Standard (in mm)	3.18	3.18	
	Maximum (in mm)	3.24	3.21	
	Minimum (in mm)	3.12	3.15	
2	Cross Sectional Area of nominal Diameter Wire (in mm2)	7.942	7.942	
3	Weight (in Kg/KM)	61.95	21.47	
4	Minimum tensile strength:As per relevant ISS			
5	Minimum breaking load before stranding (in KN)	10.43	1.29	
6	Minimum breaking load: stranding (in KN)	9.91	1.23	
7	Zinc coating of steel strands			
	Number and duration:	3 dips of 1min		
	Minimum Weight of (A s per IS-4826 – 1979)	260 Coating (i n gm/ m2)		
8	Maximum resistance at: Ohms / KM)	3.626 2.974 20°C of Aluminum strands		
9	Minim Purity of aluminum rod:	99.50%		