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Maharashtra State Electricity Distribution Co. Ltd.

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CE/DSPC/GFSS/877/16970 **Date: 02.06.2011.**

Addendum-4

To,

All prospective bidders of GFSS Tender
for Shrirampur Division under Ahmednagar Circle.

Sub: Addendum-4 to Tender for Gaothan Feeder Separation Scheme for Shrirampur Division under Ahmednagar Circle.

Ref: Tender No.CE/DSPC/GFSS/T-1/11-12.

Dear Sirs,

Pursuant to the subject Tender for Gaothan Feeder Separation Scheme for Shrirampur Division under Ahmednagar Circle, the following modifications are made to, and shall form a part of the bidding documents for the said Tender:

Volume-IV, Section-10 (Technical Specifications)

Technical Specifications of 11kV Outdoor Switchgear and associated indoor Control & Relay Panels as per MSETCL for the work at EHV Sub-stations are added in Technical Specifications (copy attached herewith).

All other terms and conditions of tender documents under subject remain unchanged.

Please note that Addendum-1 to 4 forms a part of the Bid Documents and a signed copy is to be submitted as a part of Bidders Technical Proposals.

This Addendum-4 is available on MSEDCL website www.mahadiscom.in.

Yours sincerely,

Thanking you,

Sd/-
Chief Engineer
(Dist.-SPC)

Encl: As above

Copy s.w.r.to:

1. The Director (Projects), MSEDCL Mumbai.
2. The Director (Finance), MSEDCL Mumbai.
3. The Executive Director (Projects), MSEDCL Mumbai.

Copy f.w.cs to:

The Chief General Manager (I/A), MSEDCL Mumbai.

Important Instruction to be noted by Bidders

The accompanying Technical Specification forming part of Volume IV Section 10 of the Bidding Document has been basically finalized for Independent Procurement of the equipment.

It includes several Commercial Conditions viz., Performance Guarantee, Delivery Schedule, etc. Bidders are requested to note if the Commercial Conditions included in the enclosed Technical Specification are in conflict with the corresponding conditions stipulated in other Volumes of the Bidding Documents, the later Conditions shall prevail.

SPECIFICATION NO.MSETCL/CO/O & M/11KV O/D **SWITCHGEAR**

SPECIFICATION

FOR

11 kV, 25 KA ,1600 A OUTDOOR SWITCHGEAR

AND INDOOR REMOTE CONTROL AND RELAY PANELS

FOR

VARIOUS EHV SUBSTATIONS

IN

MAHARASHTRA

M. S. E. T. C. L.

SPECIFICATION FOR 11KV, 25Ka,1600A, OUTDOOR SWITCHGEAR AND ASSOCIATED INDOOR C & R PANELS

I N D E X

SPECIFICATION FOR 11KV, 25kA,1600A OUTDOOR SWITCHGEAR AND ASSOCIATED INDOOR C & R PANELS

1.0 SCOPE :

1.1 This specification covers the basic requirements in respect of **11kV, 25kA,1600A** (with highest system voltage of 12kV) outdoor switchgear and associated indoor control and relay panels for installation at various EHV sub-stations in Maharashtra. Clause 6.1 of the specification covers the requirement of outdoor switchgear. 6.2 covers the remote (indoor) C & R Panels for controlling the outdoor switchgear.

1.2 The equipment offered against this specification shall be complete with all parts necessary for their effective and satisfactory operation. The design, materials selection and manufacture of the highest order to ensure continuous and trouble free service over the year.

2.0 REQUIREMENTS IN GENERAL:

2.1 The requirement of outdoor switchgear and Indoor C&R panels to be supplied against this specification is as per tender documents.

2.2 Recommended spares

The tenderer shall furnish in his offer, a list of recommended spares for the offered equipments that may be necessary for satisfactory operation and maintenance for a period of 5 years. Tenderers are requested to quote unit rates for these spares on 'Firm' price basis in prescribed format Annexure-I. The rates of these spares shall not be considered for tender evaluation. The unit prices should be valid for two years.

3.0 SERVICE CONDITIONS:

3.1 System particulars:

a) Nominal system voltage …. 11kV

b) Corresponding highest system voltage …. 12kV

c) Frequency …. 50Hz + 3%

d) Number of phases …. 3

e) Neutral earthing …. Solidly grounded

f) Fault level (maximum) …. 25kA for outdoor Switchgear

3.2 Equipment supplied against the specification shall be suitable for satisfactory operation under the following tropical conditions:-

a) Max. Peak ambient temperature : 50 Deg.C.

b) Max./Min. ambient temperature in shade : 45/3.5 Deg.C.

c) Max. relative humidity : 100%

d) Max. Annual rainfall : 1450mm.

e) Max. Wind pressure : 150 Kg/sq.m.

f) Max. Altitude above mean sea level : 1000 mtrs.

g) Isoceraunic level : 50

h) Seismic level (Horizontal acceleration) : 0.3 g./Zone III

i) Moderately hot and humid tropical climate conducive to rust and fungus growth.

j) Reference Ambient Temperature for temp. rise test: 45^{o} C

The climatic conditions are prone to wide variations in ambient conditions and hence the equipment shall be of suitable design to work satisfactorily under these conditions.

3.3 Auxiliary supplies available at the various sub-stations are as follows:-

a)	For heaters, lighting, F.H.P. motors, etc	Single Phase 240V 50 Hz AC supply (Variation + 10%)
b)	For control, protection, indications, annunciation and breaker trip coils.	110/220V DC supply from station batteries (Variation –15% & +10%)

4.0 Codes and Standards

4.1 The design, manufacture and performance of the equipment shall comply with all currently applicable statutes, regulations and safety codes. NOTHING IN THIS SPECIFICATION SHALL BE CONSTRUED TO RELIEVE THE TENDERER OFF THIS RESPONSIBILITIES.

4.2 Unless otherwise specified, the equipment offered shall conform to the latest applicable Indian, IEC, British or U.S.A. Standards and in particular, to the following:-

a) IS 13118 /IEC 622-71-100: Circuit breakers
b) IS 3156 : Voltage transformers
c) IS 2705 : Current transformers.
d) IS 9921 : Isolators.
e) IS 3427) IEC 529 IS 2147) : Degree of protection for cubicles.
f) IS 5 : Painting.
g) IS 375 : Wiring
h) IS 2208 : HRC fuses.
i) IS 1248 : Indicating instruments.
j) IS 722 : Energy meters.
k) IS 8875 : Control switches.
l) IS 3231 & IS 8686 : Relays.
m) IS 6005 : Code of practice for phosphating iron and steel.
n) IS 1554 : PVC insulated cables upto & including 11kV.
o) IS 2544, 5350, 13134 : Solid core insulators.
p) IS 1893, 2002 : Seismic test
q) IS 2099 : Bushings & Insulators
r) IEC 60947-7-1 : Control Terminal Block
s) IEC 62271-100 : Specification for Operating Sequence

4.3 In the event of offered equipments conforming to Standards other than the above, the salient points of comparison between the Standard (s) adopted and the relevant IS shall be indicated in the technical offer. Copies of the Standard (s) adopted shall be furnished on request.

5.0 PRINCIPAL PARAMETERS :

5.1 Principal parameters pertaining to 11kV outdoor switchgear and remote C&R panels are detailed under Clause 6.1, 6.2 respectively.

6.0 GENERAL TECHNICAL REQUIREMENTS :

All equipments/material should be of reputed make approved by MSETCL.

6.1 GENERAL TECHNICAL REQUIREMENTS FOR OUTDOOR SWITCHGEARS :

6.1.1 The requirement is for 11kV, 25KA, 1600A Switchgear for outdoor installation. Equipments shall be offered bay-wise i.e. for incomer bay and bus-section and feeder (out-going) bay and shall consist of circuit breakers, isolators, CTs and PTs, Lightening Arrestors along with suitable mounting structure and indoor C&R Panels. All these equipments shall have suitable terminal connectors as detailed under clause No. 6.1.11.

6.1.2 Bill of materials for outdoor switchgear (Bay-wise):

6.1.2.1(A). Each Incomer bay equipment shall consist of the following equipments along with PT bay as per clause No.6.1.2.1(A)

a) One Vacuum circuit breaker of rating 12kV, 25kA and suitable for 1600Amps continuous current carrying, complete with operating mechanism and necessary controls and wiring.

b) 3Nos. outdoor 11kV, current transformers of Ratio 1600-800/1-1-1 A

c) 1No. off load Isolators rated for 1600Amps. (without EB). Continuous current carrying.

d) Steel structure for mounting above items (a), (b) & (c).

6.1.2.2 PT bay consisting 3Nos. outdoor single phase.

a) PTs of ratio $\frac{11kV}{V3} / \frac{110V}{V3} / \frac{110V}{V3}$

1No. off-load Isolators rated for 400 Amps. continuous current (without EB).

b) Steel structures for mounting items a & b.

6.1.2.3 Each bus-section bay shall consist of the following equipments:

a) One vacuum circuit breaker of rating 12kV, 25kA and suitable for 1600Amps. continuous current complete with operating mechanism and control and wiring.

b) 3 Nos. 11kV outdoor current transformers of ratio 1600/800/1-1-1.A.

c) 2Nos. 11kV off-load isolators rated for 1600 Amps. continuous current (2 Nos. without EB)

d) Support structures for mounting items a, b & c above.

6.1.2.4 Each feeder (outgoing) bay shall consist of the following equipment:

a) One vacuum circuit breaker of rating 11KV 25 KA , suitable for 400 Amps. Continuous current complete with operating mechanism and controls and Wiring.

b) 3 Nos. 11KV outdoor current transformers of ratio 400-200/1-1A.

c) 2 Nos. 11KV off-load isolators rated for 400 Amps. continuous current (1 No. with EB & 1 No. without EB).

d) 11KV Lighting Arresters 1 set each (1 set – 3 Nos.)

e) Support structure for mounting items a, b & c. above.

6.1.3 Clearances and spacing as indicated below shall be provided.

a)	Phase to phase (electrical) clearance.	:	280 mm (min.)
b)	Phase to earth clearance	:	370mm (min.)
c)	Min. height of 11kV Terminal(s) from from ground level (including plinth height – 300mm)	:	3100 mm (minimum)
d)	Spacing between isolator poles	:	1000 mm (fixed)
e)	Min. height of lowest part of support insulator from ground level.	:	2500 mm

Tenderers shall confirm in their technical offer that all clearances and spacing as stated above will invariably be provided. Offers without such confirmation are liable to be rejected. Even though phase to earth clearance under normal conditions will be 160mm, at certain points where there can be bird faults (i.e. a bird sitting on the earthed metal part coming in contact with the HT terminal), clearance not less than 370mm shall be preferably provided between the HT terminal and the nearest grounded metal part.

6.1.4 CIRCUIT BREAKERS

6.1.4.1 Circuit breakers shall be 11kV, 25KA, 1600A VCBs. Only Porcelain clad breakers will be accepted.

6.1.4.2 The circuit breakers offered shall be 3-pole gang operated VCB having 25kA for 3 seconds short time rating. Incomer and bus-section breaker shall have 1600Amps continuous current rating whereas the feeder (out-going) breaker shall be of 400Amps. For similar rated circuit breakers, it shall be possible to interchange the CBs if required in future. The breaker shall be suitable for operating sequence of 0-0.3Sec-co-3min.-co. First pole clear factor may be considered as 1. 5 (IEC 6227100).

6.1.4.3 Operating mechanism for the breaker shall be housed in suitable metallic enclosure. The enclosures shall be dust, moisture and vermin proof, with degree of Protection IP55 Control cubicle for local operation of the breaker shall be mounted at a convenient height to enable easy operation from ground level. This cubicle shall also be dust, moisture and vermin proof and shall accommodate the following:-

a) T-N-C switch or push button for breaker ON/OFF.

b) Mechanical ON/OFF indicator.

c) Mechanical spring charged indicator.

d) Manual trip/close push buttons.

e) Control cable termination connector blocks with stud type terminals.
h) One power plug along with control switch (230V, 10A).
i) Space heater along with control switch.
j) Anti pumping device.
k) Electrical ON/OFF push buttons/switch shall be accessible from the ground.

In case the control cubicle mounting height is more, there shall be provision of suitable folding type platform/ladder arrangement attached to the breaker support structure, by means of which it will be possible to reach the control cubicle/operating mechanism box conveniently.

6.1.4.4 The circuit breaker shall be provided with the motor operated spring charged closing arrangement. Spring charging motor shall be suitable for 240V, 50Hz single phase AC. Spring release coil for closing shall be suitable for 110V or 220V DC depending on the sub-station battery voltage. Provision shall be available for charging the springs manually as well.

6.1.4.5 Tripping of circuit breakers shall be through "Shunt Trip" coils rated for 110/220V DC operation as per the station DC voltage. It shall be possible to trip the breaker manually in case of necessity.

6.1.4.6 In each circuit breaker, one potential free contact of the limit switch of spring charging motor shall be provided for remote indication of the spring charged. This contact shall be wired up and brought to the terminal block.

6.1.4.7 Local/Remote selector switch shall be provided in the breaker control (local) cubicle. All spare auxiliary contacts of the circuit breakers shall be wired up and brought to the terminal block for use in the remote C&R panels. Minimum 4 N/O + 4 N/C contacts shall be available on each breaker for this purpose. Auxiliary contact multiplier if any used, shall be connected in the DC supply only.

6.1.5 ISOLATOR:

6.1.5.1 For incomer and bus section bays, the isolators shall be of 1600Amps. (Continuous) rating and for feeder (outgoing), the isolators shall be of 400Amps. (Continuous) rating.

6.1.5.2 All isolators shall be of centre post rotation, double brake, horizontal isolation type and shall have a short time rating of 25KA for 1 second. The contacts and blades of the isolators shall be of electrolytic grade copper, and the fasteners (nut-bolts) used for current carrying parts (shall be of Stainless Steel). Spacing between phases for all isolators shall be of 1000mm. Current density for the copper strips shall not be more than 1.6Amp./mm2.

6.1.5.3 Electrical solenoid rated for 110V/220V DC alongwith 2 pairs of N/O contacts and 2 pairs of N/C contacts shall be provided on each isolator for interlocking with the circuit breaker. Interlocking mechanism shall be robust and foolproof and shall be such that operation (closing or opening) of the isolators will not be possible unless the Circuit Breakers are open (except by defeating the inter lock purposely for testing/maintenance).

6.1.5.4 In respect of isolators with integral earthing facility (i.e. Isolator with EB), it shall have built-in mechanical inter lock between the main and earth blades so that closing of the earth blades will not be possible without opening the main blade.

6.1.6 CURRENT TRANSFORMERS: (OIL FILLED ONLY)

6.1.6.1 All Current transformers shall be outdoor type, with the insulator housing of Polymer/ Porcelain material. The tenderer may offer both dead tank type and live tank type (with top tank) CTs. Final choice of dead tank will be rest with the MSETCL. Unit prices of both types shall therefore be quoted. CTs shall have a short time rating of 25KA for 3 seconds. The primary and secondary windings of CTs shall be of copper. CTs details for incomer, bus section and feeder (outgoing) bays will be as follows:

Sr. No.	CTs details	Incomer	Bus-Section	Feeder
a)	Ratio	1600-800 1-1-1A	1600-800 1-1-1A	400-200 1-1A
b)	Class of accuracy i) Core I ii) Core II iii) Core III	 0.2 5P10 P.S.	 0.2 5P10 P.S.	 0.2 5P10 --
c)	Purpose of each Core i) Core I ii) Core II iii) Core III	Metering O/c Protection (Transformer differential protection)	Metering O/c Protection	Metering O/c Protection
d)	Burden iv) Core I v) Core II vi) Core III	 10VA 15VA --	 10VA 15VA --	 10VA 15VA --

Core II and III on Incomer CTs shall have knee point voltage. (VKP) more than 300 Volts at 800Amps. and more than 150Volt at 400 Amps. respectively.

6.1.6.2 In case all three CTs are mounted on the same structure, clearances as specified earlier shall be maintained. CTs shall be only of reputed make approved by the MSETCL. Performance certificates and type test certificates for CTs shall be furnished along with the technical offer.

6.1.6.3 Unit prices of 400-200/1-1A rating CTs for outgoing feeders shall be quoted by the tenderers.

6.1.7 POTENTIAL TRANSFORMERS: : (OIL FILLED ONLY)

6.1.7.1 Potential transformers shall invariably be oil cooled single phase units. Three such units shall be offered for each PT bay. These PTs shall be suitable for connection in star formation

6.1.7.2 The PTs shall have primary and secondary windings made of copper. PT shall have two windings in the secondary and shall have following ratio, burden & accuracy class:-

a) Ratio	:	$\frac{11kV}{V3} / \frac{110V}{V3} / \frac{110V}{V3}$
b) Burden	:	Core - I – 50 VA
	:	Core - II – 50 VA
c) Class of accuracy	:	Core – I Class 0.2 & 3 P (dual purpose).
	:	Core II – 3 P
d) Purpose	:	Core – I Metering & Protection O/C
	:	Core – II Directional E/F Protection.
e) Connection	:	Star/Star, Open delta.
	:	Primary - Star. Secondary - Core 1 – Star Secondary - Core 2 – Open delta.

6.1.7.3 PTs manufactured by only reputed firms approved by the MSETCL shall be offered. Performance report and type test certificates in respect of the PTs together with G. A. drawing shall be submitted along with the technical offer.

6.1.8 11KV LIGHTING ARRESTERS: (IEC 600994&IS 3070-1993 Part-3)

Zinc Oxide gapless type single column station class, 9KV,10KA class 2

1.Leakage current at COV-<400 micro A
2.Maximum COV-7.65Kv rms
3.Max residual vol 8/20micro sec discharge at 10KA-28KV peak
4 Min energy discharge 4KJ/Kv
5.High current Inpulse withstand value 100KA
6 Virtual discharge micro Sec 2000micro sec
7.Pressure relief class 40KA/ClassA
8.Partial discharge at1.05 times <10PC
9.Overvaltage capability at.01 sec- 16KV peak
10.Lightning impulse withstand voltage-75KV peak/dry&wet 28KVrms

11. Maximum switching impulse residual voltage 30/60 Micro S at 500 amp.- 22.4 Kv peak.
12. WT of complete unit 14KGs+/-10%
13. HT of unit from base to line side (mm)-360mm+/-20
14. Minimum spacing below LA centre to centre 650mm
15. Clearance from ground-500mm
16. Mounting flange dimentional-3 hole of dia14mm over a PCD of 226+/-6mm

6.1.9 PAINTING:

6.1.9.1 All sheet metal parts (cubicle, mechanism box, etc.) for outdoor installation shall be designed and fabricated with special care to avoid rust/fungus formation and corrosion. All metal parts shall be hot dip galvanised. If this is not possible due to practical difficulties, cold galvanising or epoxy coating shall be provided for all sheet metal parts, used for outdoor installation. Sheet steel shall be treated as per the 7 tank process. In case 7 tank process for treating the sheet metal is not possible, alternate process adapted shall be clearly explained in the technical offer. Dark admirality Grey shade as per color shade no. 632 of IS-5 shall be used for epoxy coating.

6.1.9.2 The sheet metal works, after final painting shall present an aesthetically pleasing appearance, free of any dent or uneven surface.

6.1.10 SUPPORT STRUCTURE, EQUIPMENT FRAME ETC.

6.1.10.1 Equipment frame, support structure, angles, channels fasteners (Nut bolts), etc. meant for the outdoor switchgear and other equipments viz. CTs, PTs, Isolators etc. shall all be hot dip galvanized. No spring washer shall be used, instead one check nut of suitable size shall be provided with each bolt.

6.1.10.2 Support structure shall be supplied for each of the outdoor equipment and shall be suitable to maintain the clearance and spacing stipulated for various equipment. Current transformers and circuit breakers shall be mounted on the same structure, provided the clearances are properly maintained. In the case of feeder (outgoing) bays, the line side breaker, isolator and CTs shall be mounted on the supports structure itself, provided the clearances as specified are maintained.

6.1.11 BUSHINGS & INSULATORS

All outdoor type Porcelain/Polymer bushings and insulators shall have a creepage distance of 300mm. The bushing shall be of outdoor type conforming IS 2099. All bushings shall have a rated voltage not less than 17.5 kV and rated current of 2000 Amps.

6.1.12 EQUIPMENT/TERMINAL CONNECTIONS (HV):

Tenderers shall include in their scope suitable connectors for each outdoor equipment. In the case of equipment with copper terminals, the terminal connectors shall be made of electrolytic grade copper, and shall be suitable for crimping type connection.

Off-take terminals of both the isolators of each bay shall be of electrolytic grade aluminium and suitable for crimping ACSR jumper. These connectors shall be suitable for twin 0.4 Zebra ACSR conductor for outgoing feeder. All nut bolts used in the connectors shall be of non-magnetic stainless steel. In place of spring washers, check nut of suitable size shall be provided.

6.1.13 LOADING DETAILS:

Successful tenderers shall clearly indicate on the relevant G.A. drawings the total dead weight coming on each support structure. Impact load, if any, shall also be stated on relevant drawing. These details are required for designing suitable foundations for the support structure for CBs, Isolators, etc.

6.1.14 WIRING AND CONTROL WIRING TERMINALS: (Colour shade as per IS)

6.1.14.1 All wiring shall be carried out with 1100 Volts grade single core, multistrand flexible tinned copper wires with PVC insulation. No wire shall be of size less than 2.5 sq.mm/lead.

6.1.14.2 All L.T. terminal connectors shall be of brass, nickel plated. Terminal shall be stud type. 20% spare terminals shall be provided on each terminal block.

6.2 General Technical Requirements for 11kVIndoorC&R panels (Double Feeder)

CONSTRUCTIONAL DETAILS :

6.2.1 The C&R panels against this specification shall be simplex type with all controls, indications, meters and protective relays mounted on the front. Each panel shall accommodate all the necessary equipment required and as indicated in the enclosed General Arrangement drawings.

6.2.2 The panels shall be free-standing, floor mounting type suitable for indoor installation. Panels shall be completely metal enclosed, and shall provide degree of protection not less than IP 44 in accordance with IS 2147.

6.2.3 Panels shall be made of rigid structural frames enclosed completely with smooth finished sheet steel of thickness not less than 3 mm for front panel and 2 mm for doors, sides, top, and bottom portions. There shall be sufficient re-enforcement to provide level surfaces, resistance to vibration and rigidity during transport, installation and operation.

6.2.4 Each simplex panel shall have suitable hinged doors at the back. The doors shall be provided with 3-point locks operated by suitable handle. Bottom plates of the panels shall be fitted with removable gland plates to allow cable entry from the bottom. Gland plates shall be suitable for fixing the cable glands at an elevated height of at least 100 mm above the ground level.

6.2.5 Design, materials selection and workmanship shall be such as to result a neat appearance both inside and outside with no welds, rivets or bolt heads apparent from outside. Steel sheets shall be suitably treated to achieve neat appearance and also long life. Final painting of panels shall be done with Light Grey colour to shade no.631 as per IS-5, for both interior and exterior. Epoxy powder coating method shall be used for painting, and shall have matty finish.

6.2.6 All wiring shall be carried out with 660 volts grade single core, multistrand flexible copper wires with PVC insulation. The conductor size shall be 2.5 sq. mm (minimum) for CT circuits and 1.5 sq. mm for other circuits. Wiring troughs may be used for routing the cables. Wire numberings and colour code for wiring shall be as per IS 375.

6.2.7 The terminals shall be stud type. Control terminal blocks should be as per IEC 60947-7-1. The insulating material should be polymide and all metal parts should be non-ferrous. The screws shall be captive and terminals be shock protected.

6.2.8 MCBs of appropriate rating shall be provided for DC positive and negative of each circuit/sub-circuit. MCBs shall also be provided for AC (240V) circuits.

6.2.9 All front mounted as well as internally mounted items including MCBs shall be provided with individual identification labels. Labels shall be mounted directly

below the respective equipment and shall clearly indicate the equipment designation.

6.2.10 Each panel shall be provided with one cubicle illumination lamp controlled by door operated switch. Space heater of suitable rating along with control switch shall be provided inside each panel. Cubicle lamp and space heater shall be suitable to work on 240 V A.C. supply. In each panel, one 3-pin 5 A power plug alongwith control switch shall be provided.

6.2.11 Each panel shall be provided with one earth bus of size 25 x 3 mm (minimum) . The earth bus shall be of copper, and all metallic cases of relays, instruments etc. shall be connected to this earth bus . The wire used for earth connections shall have green insulation.

6.2.12 The panels shall be of overall dimensions 700 x 750 x 2312 (W x D x H) mm. The height 2312 mm is inclusive of the height of base frame. The height of base frame is generally 102 mm , and shall be painted black. On each panel (twin feeder/twin bus-section) accommodating equipment for two circuits, the equipments for individual circuit shall be easily distinguishable. The constructional details and mounting arrangement for various front mounted equipments shall be as per the enclosed drawings. The center lines of any relays, if additionally provided, shall not be less than 450 mm from ground level. Mounting of any relays internally shall be subject to specific approval of the purchaser.

6.2.13 In addition to the main circuit label, each panel shall be provided with a label indicating the following details :

1) Name of supplier :

2) Purchase order ref: (T- dtd.)

3) DC voltage:

4) Panel sr.no :

This label shall be provided on the rear side close to the door handle or on the base frame. This label shall be made of PVC strips, and shall have white letters on black back ground. Alternatively, metal photo printed anodized aluminium plates may be provided as labels. A sticker type label indicating the above details shall be provided on the packing case for easy identification.

7.0 PROTECTIVE RELAYS AND CONTROL / INDICATION EQUIPMENT :

The relays, switches, meters and other accessories offered shall be of reputed makes and of proven design. The bidders may offer more than one alternative (subject to a maximum of three), for each equipment, provided all the alternatives meet the requirement of the technical specification. In case any or all the alternatives offered is/are found to be not acceptable to MSETCL, the bidder

shall be ready to offer any alternative equivalent which is acceptable to MSETCL.

7.1 **Protective relays :**

7.1.1 Main protection for 11kV feeders and bus-sectionalizers shall be microprocessor/microcontroller based, fully programmable and communicable type non-directional over current and earth fault relays. For 11kV Incomer, the protection shall be microprocessor/microcontroller based, fully programmable and communicable type directional over current and earth fault relays. These relays shall have 3-seconds IDMTL characteristic as well as instantaneous highset trip feature. It shall be possible to select the required settings & characteristic at site. The relay shall be of a fully type tested design and the test report thereof shall not be more than five(5) years old as on the date of submission of tender.

7.1.2 In case any special software/devices are required for the testing/setting of the protective relays, the bidder shall include one set of such accessories per panel in the offer free of cost to MSETCL (Purchaser). The list of such items shall be furnished in the offer.

7.1.3 The relays meant for EHV substations shall be suitable for operation on 110V DC as well as 220V DC.

7.1.4 All protective relays offered shall conform to electromagnetic compatibility requirements as per the relevant IEC/other international standards. The test reports in this regard shall be submitted along with the other type test reports.

7.1.5 Relays shall be suitable for flush mounting, with only the flanges projecting on the front and connections at the back. Relays shall have dust-tight covers removable from the front.

7.1.6 In case the protective relays offered are not manufactured by the tenderer, an undertaking from the respective relay manufacturer indicating his readiness to extend necessary technical support and back-up guarantee as brought out in for the satisfactory operation of the relay shall be furnished by the tenderer in his offer. The tenderers shall also furnish an undertaking (from the relay manufacturers) confirming that the relay offered is in the current range of manufacture and will not be phased out for at least 10 years from the date of supply.

7.1.7 Output contacts of any of the protective relays shall not be directly wired up for energizing the CB trip coil, but shall energize the electrical hand-reset type trip relay, the output(NO) contacts of which shall be connected for extending trip command to the breaker.

7.1.8 The O/C + E/F relays shall have built-in LBB feature to monitor the stuck breaker condition. In case of LBB operation of feeder breaker, the master trip relay of transformer and the bus sectionalizer bays are to be tripped. For this purpose one self reset type aux. relay having 4 N/O contacts shall be included. In case of LBB

operation of bus-sectionalizer breaker the associated aux. relay output shall energise master trip relays of all transformers connected to the bus.

7.2 **Circuit Breaker Control Switch :**

Conventional T-N-C type switch shall be provided for remote trip/close operation of circuit breaker. The switch shall have pistol grip type handle and shall be of robust design. Contacts of the switch shall be rated for the trip/close duty. The switch shall be mounted in the mimic diagram itself such that the stay-put ('N') position will render the continuity of the mimic. One green LED lamp for 'breaker open' indication and one red lamp for 'breaker closed' indication shall also be provided adjacent to the T-N-C switch.

7.3 **Semaphore Indicators :**

Semaphores used for isolator open/close status indication shall be mounted in the mimic, such that the isolator closed position shall complete the continuity of the mimic. When the isolator is 'open', the dial of semaphore shall be at 90 degree to the above position. The semaphore indicators shall be three position type, having one intermediate position to indicate the "DC supply fail" condition.

7.4 **Earthing :**

7.4.1 Each panel shall be provided with earth bus of copper having size not less than 25 x 3 mm securely fixed to (inside) base of panels. Since several control panels are to be mounted adjoining each other, the earth bus shall be made continuous and necessary connectors and clamps for this purpose shall be included in the scope of supply. Provision shall be kept to extend the earth busbars to future adjoining panels.

7.4.2 All metallic cases of relays, instruments and other mounted equipments shall be connected to earth bus by copper wires of size not less than 2.5 sq.mm. The colour of insulation for earthing wires shall be Green.

7.5 **Indicating Lamp :**

7.5.1 Indicating lamps shall be panel mounting type with rear terminal connections. Lamp shall be provided with series connected resistors preferably built-in in the lamp assembly. Lamps shall have translucent lamp covers to diffuse lights, coloured red, green, amber, clear white or blue as specified. The lamp cover shall be preferably of screw-on type, unbreakable and moulded from heat resisting material.

7.5.2 All indicating lamps shall have bright LEDs having long life. Conventional bulbs are not acceptable. The indicating lamps with resistors shall withstand 120% of rated voltage on a continuous basis.

7.6 **Trip circuit supervision scheme :**

Trip circuit supervision scheme shall be such that testing of trip circuit healthiness is possible irrespective of whether the C.B. is in the closed or open position. The scheme using push button and indicating lamp is envisaged. When the breaker is closed, the lamp should remain continuously 'ON' as long as the trip circuit is healthy. When the breaker is open, trip circuit supervision shall be on-demand, i.e. by pressing the push button. The scheme shall be such that both the trip coils of each circuit breaker is simultaneously and independently supervised.

7.7 Trip relays :

The trip relays shall be high speed, electrical hand reset type and push button for resetting the trip relay shall be provided separately. The relay shall have heavy duty contacts suitable for tripping function. Relay shall have minimum 2NO + 2NC contacts. On operation of the protective relay, the respective trip relay shall get energized. Output contact (N/C) of the trip relay shall be wired up in the breaker closing circuit for interlock. Operating time of the trip relay shall not exceed 10ms and the type test reports shall not be more than five (5) years old as on the date of submission of bids.

8.0 **METERING : (TYPE TEST REPORT ARE NOT REQUIRE)**

Provision for mounting of ABT/Multifunction Energy Meter shall be provided, also complete wiring up to the meter mounting shall be done as per MSETCL standard.

8.1 Ammeter & Ammeter Selector Switch :

For each circuit one ammeter and associated selector switch shall be provided.

The ammeter shall be moving coil type. Ammeter shall be 240 degree scaled and of size 96 sq.mm.

Ammeter Selector switch shall be a four-position rotory type with R, Y, B and 'OFF' positions marked clearly on the face plate.

9.0 **GENERAL REQUIREMENTS :**

9.1 The panels shall be delivered to the various consignees of the MSETCL as will be informed to the successful tenderers. The panels shall be transported only by road and shall be suitably packed to avoid damages during transit.

9.2 Three sets of drawings shall be submitted for approval within 30 days from the date of issue of the Letter Of Award(LOA). After approval of the drawings, the supplier shall furnish 2 sets of the final drawings per panel for use in various field offices. Copies of technical literature and commissioning manuals (3 sets

per sub-station) shall be furnished along with the contractual drawings. All these shall be supplied duly packed and kept inside each panel. This shall also be listed in the packing list. All drawings shall be of uniform size, preferably A3 size. No drawings of width more than 35 cm will be acceptable. The supplier shall also furnish 1 set of reproducible (tracings) of all the final drawings to the office of Chief Engineer, Transmission Operation & Maintenance Department, MSETCL, 5th Floor, Prakashganga, Bandra-Kurla Complex, Bandra (E), Mumbai-400 051.

10.0 TESTS :

A) LIST OF TYPE TESTS 11KV VCB

Sr.No. Type test

1) Basic short circuit tests
2) Short line fault tests.
3) Out of phase making and breaking tests.
4) Line charging breaking current tests.
5) Cable charging breaking current tests.
6) Single Capacitors Bank breaking current tests.
7) Short time and peak withstand current tests.
8) Lightning impulse voltage test.
9) P.F.Voltage withstand test (dry & wet).
10) Temperature rise test.
11) Mechanical operation test.
12) Degree of protection (IP55) for all cabinets.
13) RIV Test/Visible corona test.
14) Single phase short circuit test (for 3 phase mechanically gang operated breaker).
15) Seismic test.

NOTE:

1) Tests indicated at Sr.No.2,3,4,13 and 15 are not mandatory.

B) **LIST OF TYPE TEST FOR CT / PT /LA/ ISOLATER**

Sr. No.	CTs (as per IS2705)	PTs (as per IS 3156)	Isolator	LAs
1	Short Time Current Test	Lighting Impulse voltage withstand Test	Lighting impulse voltage withstand Test	Lighting impulse & (Dry/Wet) power frequency Test
2	Lighting impulse voltage withstand Test	Temperature Rise Test	Power Frequency voltage Test (Dry & Wet)	Residual voltage Test
3	Temperature Rise Test	Accuracy Class Test	Temperature Rise Test	Long duration impulse withstand current Test

4	Accuracy Class Test	High voltage power frequency wet withstand voltage test	Short time current & peak withstand test	Operating Duration test
5	High voltage power frequency wet withstand voltage test	- -	Mechanical induction test	Accuracy level Aging Test
6	- -	--	--	Partial discharge test
7	-	-	-	Porosity Test

C) The type test shall be carried out at following Laboratories or at any other Laboratories accredited by National Accreditation Board for Testing & Calibration Laboratories (NABL).

(I) Central Power Research Institute (CPRI).
(II) Electrical Research and Development Association, Vadodara (ERDA).
(III) Indian Institute of Technology (IIT) for Seismic Test.
(IV) Following Short Circuit Test Laboratories:
(a) CESI, Italy.
(b) KEMA, Holland.
(c) SATS, Ludvica, Sweden.
(d) PEHLA, Germany.

10.1 <u>Type Test</u> :

10.1.1 The equipment/material offered (i.e VCB, CT, PT, Isolator, LA, C&R Panel etc.) in the Tender should have been successfully type tested & submitted type test certificates along with the offer only in line with relevant Standards and the Technical Specification within the last 5(five) years prior to the date of opening of the Tender. Copies of type test reports in respect of all protective relays, MF meter, trip relay, etc. shall invariably be submitted along with the offer. The type test reports shall be complete in all respects. Incomplete type test reports and type test reports which are more than 5 years old will be treated as invalid and the offer will be rejected..

10.1.2 If there is any change in the components or design in the equipment since the earlier passing of the Type Test, the bidder shall bring out in his offer all such changes made in components, materials, designs, etc. In such case the bidder shall carry out the type tests at his cost and in presence of the purchaser's representative.

10.1.3 The purchaser reserves the right to conduct tests included in the list of Type Tests on requisite number of samples/items from any of the lots during the tenure of the supply, at the purchaser's cost in the presence of purchaser's representatives. If the equipment/material does not withstand the type test, then the equipment/material supplied till then will be liable for rejection. The supplier, in such an eventuality, shall be allowed to modify the equipment and type test the same again at his cost in the presence of the purchaser's representative. These type tests shall however be conducted by the supplier within a reasonable time. After successful passing of the type tests, all the equipments/materials supplied earlier shall be modified in line with the equipment/materials which have successfully passed the type test. In case the supplier fails to carry out the Type Test within reasonable time or does not agree to carry out the type tests at his cost, his equipment/material supplied earlier shall be rejected and the order placed shall be cancelled and payments made earlier for these supplies shall be recovered by the purchaser.

10.2 **Acceptance and Routine Tests :**

10.2.1 All acceptance and routine tests as stipulated in the relevant standards shall be carried out by the supplier in the presence of the Purchaser's representative without any extra cost.

10.2.2 Immediately after finalisation of the programme of type/acceptance/routine testing, the supplier shall give four weeks advance intimation to the purchaser, to enable him to depute his representative for witnessing the tests.

10.2.3 The supplier shall carryout all the relevant physical verifications and functional tests as applicable at his works on all the finished C&R panels. Copies of these test certificates duly endorsed by the supplier's testing engineer shall be furnished to the inspecting officer of the MSETCL. The inspecting officer reserves the right to insist for repetition of functional tests on any or all of the panels offered for inspection, and the supplier shall arrange for the same:

11.0 QUALIFYING REQUIREMENTS:

11.1 The bidder should be manufacturer of offered VCB..

11.2 The bidder/supplier shall have proven experience of not less than 5 years of Design, Manufacture, Supply and Testing at works for equipment/ materials offered for equal or higher voltage class. The equipment/material (i.e VCB, CT, PT, Isolator, LA, C&R Panel etc.) offered should be in successful operation for at least 2 years .

11.3 The Bidders not meeting the requirement at Clause No.11.2 can also participate provided, they have valid ongoing collaboration with a manufacturer who has at least 10 years experience in the Design, Manufacture and Testing of the equipment of the type and class offered which have been in satisfactory service for a period of at least 7 years. In such an event the bidder shall furnish along with the bid the

documentary evidence for the same and undertaking from the bidder and collaborator accepting joint and several liability for all obligations under the contract.

11.4 The bidder themselves not meeting the requirements at (11.2 & 11.3) above, can also participate provided they are subsidiary company in India and their principal is having majority share holdings i.e more than 51% in the bidder (subsidiary). Further, the principal should be the manufacturer who has at least 7 years experience in the design, manufacture and testing of equipment of the type and class offered or higher voltage class, which would have been in satisfactory service for a periodof at least 3 years. In such an event, the bidder shall have to furnish along with the bid, the documentary evidence for the same and undertaking from the principal for accepting joint and several liabilities for all obligations under contract.

11.5 The bidder/supplier should have adequate in-house testing facilities for conducting acceptance tests in accordance with relevant IS.

11.6. The bidder should have a minimum turnover of 60% of the estimated cost of the offered item/items in any one of the financial year during the last three (3)years.

11.7 The bidder should furnish all the relevant documentary evidence to establish the fulfillment of the above requirements. Also all type test certificates for the equipment/material offered (i.e VCB, CT, PT, Isolator, LA, C&R Panel etc.) shall be submitted along with offer.

11.8 The bidder is liable for disqualification on account of any of the following reasons:

(a) Poor quality and workmanship of the products previously supplied and frequent failures during warranty period as experienced by the purchaser.

(b) Bidder against whom a litigation is in process.

(c) Bidder, who in the opinion of the purchaser has malafide intentions in the conduct of business with the company (MSETCL).

(d) Bidder who is declared to be a defaulter as per the terms and conditions laid down by the Company.

11.9 Notwithstanding anything stated above, the purchaser's decision to this regard . will be final.

12.0 <u>INSPECTION:</u>

No equipment against this specification shall be desptached from the works of the supplier without proper inspection by the representative of the MSEB. During the inspection all routine tests, including operational (functional) checks shall be carried out on the equipment.

13.0 <u>QUALITY ASSURANCE PLAN:</u>

13.1 The tenderer shall furnish along with his offer the quality assurance plan adopted by him/his sub-supplier in the process of manufacturing all major equipment/components.

13.2 Precautions taken for ensuring the usage of quality raw materials and sub-

components shall be stated in the Quality Assurance Plan.

14.0 PERFORMANCE GUARANTEE:

The equipments offered shall be guaranteed for satisfactory performance for a period of 60 months from the date of receipt of complete equipment at destination store/site in good condition or 54 months from the date of satisfactory commissioning of equipment whichever is earlier. The equipments found defective/failed within the above guarantee period shall be replaced/repaired by the supplier free of cost within one month of receipt of intimation. If the defective/failed equipments are not replaced/repaired as per the above guarantee clause, the Board shall recover an equivalent amount plus 15 % supervision charges from any of the supplier's bills.

15.0 DOCUMENTATION:

15.1 After issue of detailed purchase order, the successful tenderers shall submit 4 sets of complete drawings along with detailed bill of materials for approval to the Chief Engineer (Tr. O&M), Transmission O&M Department, MSETCL 5th Floor, Prakashganga, Bandra-Kurla Complex, Mumbai 400 051. If any modification are required on these, the same will be conveyed to the supplier who shall modify the drawings accordingly and furnish final drawings for approval. In normal practice, the documents submitted for approval will be commented upon or approved if in order, within 30 days from the date of receipt of the same in the Tr. (O&M) Department, MSETCL.Cons.GA drawing to be submitted by bidder.

15.2 The manufacturing of the equipment shall be strictly in accordance with the approved drawings and no deviation will be permitted without the written approval of the Tr, O&M department. All manufacturing and fabrication work in connection with the equipment's prior to the approval of the drawings shall be the supplier's risk.

15.3 After approval of the drawings and bill of materials, the suppliers shall submit detailed packing lists for approval. After approval copies of these packing lists shall be forwarded to the respective consignees. Copies of packing lists shall also be submitted to the Dy C.A.O.(SB), MSETCL, along with the bills for payment.

15.4 Before dispatch of equipment to various consignees, the suppliers shall furnish sets of final drawings, including bills of materials and wiring schedules and also sets of technical literature and commissioning manuals. These shall be in five sets per Sub-station and shall be furnished to the Tr. O&M Department, MSETCL. Prakashganga, 5th Floor, Bandra-Kurla Complex, Mumbai 400 051 positively before the dispatch of equipment. All drawings shall preferably be of A3 size. No drawing of width more than 35 cm will be acceptable. One set of final drawings, shall invariably be forwarded to the consignee along with the consignment and shall be listed out in the packing list, when submitted for approval.

15.5 Suppliers shall also furnish one complete set of reproducible of the relevant final drawings on soft form to the Transmission O&M Department, MSETCL. Prakashganga, 5th Floor, Bandra-Kurla Complex, Mumbai 400 051.

16.0 PACKING AND FORWARDING:

16.1 The equipment shall be packed in crates suitable for vertical/horizontal transport as the case may be and the packing shall be suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable materials shall be carefully packed and marked with the appropriate caution symbols. Wherever necessary, proper lifting arrangement such as lifting hooks etc. shall be provided. Any material found short inside the packing cases shall be supplied by supplier without any extra cost.

16.2 Each consignment shall be accompanied by a detailed packing list containing the following information:
a. Name of the consignee.
b. Details of consignment.
c. Destination.
d. Total weight of consignment.
e. Sign showing upper/lower side of the crate.
f. Handling and unpacking instructions.
g. Bill of materials indicating contents of each package.

16.3 All the equipment covered in this specification shall be delivered to the various stores centers of the MSETCL as will be intimated to the successful tenderers. The equipment shall be delivered to these stores centers **only by road transport,** and shall be suitably packed to avoid damages during transit in the case of indigenous supplies.

16.4 The tenderers shall quote delivery period for various equipment, and shall stick on to the committed delivery. It may clearly be noted that the delivery periods will under no circumstances be linked up with other formalities like drawing approval, etc. It is therefore the responsibility of the successful tenderers to submit the drawings, bill of materials, packing lists, etc. in time and get these approved by the Tr. (O&M) Department of the MSETCL.

17.0 TRAINING OF ENGINEERS

All successful tenderers for switchgear shall provide training facilities for the MSETCL Engineers. The training shall be for not less than 8 weeks. Syllabus and other details of the training shall be finalized in consultation with the MSETCL. Boarding, lodging and traveling expenses for the deputed trainees will be borne by the MSETCL.

18.0 SUPERVISORY ERECTION AND COMMISSIONING:

The erection and commissioning of the equipment covered in this specification will normally be carried out by the MSETCL personnel. However, the tenderers may quote their terms and conditions for deputing their Engineers / Technicians to the various sites for carrying out the erection and commissioning work. As prescribed under Annexure-VII.

19.0 SCHEDULES

Various schedules to be filled in and submitted by the tenderer are furnished at Annexure I, II, III, IV, V, VI, VII & VIII. Any additional information other than those called for as per the above schedules may be furnished separately by the tenderer, if felt necessary by him.

20.0 FORMATION TO BE FILLED-IN & FURNISHED INVARIABLY BY THE TENDERERS :

20.1 The offer shall be complete in all respects, failing with same are liable for rejection. In the bill of materials of each items, the tenderer shall state the type designation and make of each item / equipment. Unit prices of all items and sub-components shall be quoted. The list of items for which unit prices are quoted (without the price part) shall be submitted along with the technical offer. Guaranteed technical particulars for various equipment shall be elaborated and complete in all respects. It may be noted that the technical evaluation of the tender is made mainly based on the guaranteed technical particulars furnished along with the technical offer.

20.2 In the case of the outdoor switchgear, the MSETCL wishes to adopt a common foundation arrangement (bay-wise), to be followed in future, irrespective of the make. As such, it will be necessary for all the successful tenderer's to design the equipment by interacting among themselves so as to achieve a common (bay-wise) foundation arrangement as per the MSETCL requirement.

21.0 REQUIREMENT OF DOCUMENTS:

(A) Following information shall be furnished along with the offer IN **ELECTRONIC FORM**

a) Details of type test reports invariably furnished as per clauses no. 10 & 11 for the offered equipments.

b) Calculations of loading data for mechanical design of support structure for foundation and design of equipments terminal pads.

c) Certificate of accredation of the testing laboratory where the type tests are conducted.

d) List of Past Five Year Experience of supplies for each type of equipments offered for evaluation of Qualifying requirements.

e) Two Years Undertaking to provide service and spares for service life of equipments offered as per clause No. 2.2 of technical specification.

f) Two Years Performance certificate for the offered equipments for evaluation of Qualifying requirements.

g) Unit rates of spares Cl. 2.2 of technical specification and charges for supervisory erection & commissioning as per Cl. No. 18 shall be quoted in prescribed Annexure-I.

(B) Following information/documents (in duplicate) duly sealed and signed on each page shall be submitted in physical form / C.D. on or before the scheduled date and time of submission of the tender .

a) Details of Quality Assurance plan .
b) Type test reports as per Cl. 10. duly sealed and signed on each.
c) General arrangement drawing & Cons.GA drawing for outdoor switchgear and Indoor C&R panels
d) Test report of actual measurement of actuating force required for charging manually (N).

Technical Specification Cont...

Item	Technical Specification
11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+9 F) (82126010644)	Refer To The Following Item Specification:11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+8 F) (82126010564)
11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (1 I/C+0 B/S+8 F) (82126011534)	Refer To The Following Item Specification:11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+8 F) (82126010564)
11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+5 F) (82126011614)	Refer To The Following Item Specification:11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+8 F) (82126010564)
11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+12 F) (82126010304)	Refer To The Following Item Specification:11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+8 F) (82126010564)
11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+10 F) (82126010484)	Refer To The Following Item Specification:11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+8 F) (82126010564)
11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (1 I/C+0 B/S+6 F) (82126011374)	Refer To The Following Item Specification:11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+8 F) (82126010564)

Guaranteed Technical Particulars (To Be Filled Online)

ItemCode	82126010564
ItemName	11KV 25KA Outdoor Switchgear with remote indoor C&R Panel comprising of (2I/C+1B/s+8F)
Sr.NO	GTP Parameters
1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation
2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)
17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18) Whether manual trip/close possible(Yes/No)
19	19) Whether mechanical spring charging possible (Yes/No)
20	20) Type of material for main/arcing contacts.
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
32	32) Whether type tested in India (Yes/No)
33	II. ISOLATORS - 1) Make and type designation
34	2) Continuous current rating
35	3) Vertical Isolation/Horizontal isolation type
36	4) Spacing bewtween phases
37	5) Creepage distance of insulator
38	6) Voltage rating of insulator
39	7) Whether solenoid mechanism and auxiliary switches provided for interlock
40	8) Height of the HT terminal from nearest metal ground
41	9) Height of the HT terminal from ground level (with support structure)
42	10) Material for moving blade and fixed contacts
43	11) Whether earth switch provided (Yes/No)
44	12a) If earth switch is provided, material of earth blade
45	12b) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA

47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2
53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)
55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core
70	6) Type of bushing and creapage
71	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
72	8) Whether type tested (Yes/No)
73	9) Rated Voltage Factor and Time
74	10) Type of Insulation Housing
75	11) Whether HT fuses provide
76	12) Material used for primary/secondary winding.
77	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
78	2) Multi-function electricity meter(0.2 class) and TTB
79	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
80	4) T.N.C. type control switches for circuit breaker.
81	5) Semophore indications for isolators
82	6a)Indicating lamps for Trip circuit healthy indication
83	6b) Indicating lamps for CB ON (red)
84	6c) Indicating lamps for CB Off (Green)
85	7a) Push button for Trip circuit test
86	7b) Push button for Alarm accept
87	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.
88	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
89	10) Ammeter selector switch
90	11) Electrical reset type trip relay along with reset push button
91	12) Internally mounted Space heater and control switch
92	13) Internally mounted Cubicle illumination temp and door switch.
93	14) Internally mounted Power plug and control switch
94	15) Internally mounted Alarm cancellation relay
95	16) Internally mounted Alarm Bell
96	17) Internally mounted MCBs links control wiring, etc.
97	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
98	2) Multi-function electricity meter (0.2 Class) and TTB

99	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
100	4)T-N-C type control switches for circuit breaker in number
101	5)Semophore indications for isolators in number
102	6a) Indicating lamps for Spring charge indicator (White)
103	6b) Indicating lamps for Trip circuit healthy indication (Amber)
104	6c)Indicating lamps for CB ON (red)
105	6d)Indicating lamps for CB OFF (green)
106	7a)Push button for Trip circuit test
107	7b)Push button for Alarm accept
108	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
109	9) Ammeter (96 x 96) 240 deg. Scale
110	10) Ammeter selector switch
111	11)Electrical rerset type trip relay with reset B
112	12a)Internally mounted Space heater and control switch
113	12b) Internally mounted Cubicle illumination lamp and door switch.
114	12c) Internally mounted Power plug and control switch
115	12d) Internally mounted Alarm cancellation relay
116	12e) Internally mounted Alarm Bell
117	12f) Internally mounted MCBs links control wiring, etc.
118	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
119	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
120	3a)T-N-C type control switches for circuit breaker.
121	3a)T-N-C type control switches for circuit breaker.
122	3b) Semophore indications for isolators
123	4a) Indicating lamps for Spring charge indicator (White)
124	4b)Indicating lamps for Trip circuit healthy indication (amber)
125	4c) Indicating lamps for CB ON (Red)
126	4c) Indicating lamps for CB ON (Red)
127	4d) Indicating lamps for CB OFF(Green))
128	5a) Push button for Trip circuit test
129	5b) Push button for Alarm accept
130	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
131	7)Multi function electricity meter 0.2 class and TTB
132	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
133	9)Ammeter selector switch
134	10)Electrical reset type trip relay along with push button
135	11a) Internally mounted Space heater and control switch
136	11b) Internally mounted Cubicle illumination lamp and door switch.
137	11c) Internally mounted Power plug and control switch
138	11d) Internally mounted Alarm cancellation relay
139	11e) Internally mounted Alarm Bell.
140	11f) Internally mounted MCBs links control wiring, etc.
141	11f) Internally mounted MCBs links control wiring, etc.
142	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
143	2. Overall dimensions (HXWXD)
144	3. Thickness of sheet steel
145	4. Colour shade
146	5. Mimic shade
147	6. Type of painting
148	7. Whether wiring troughs used
149	8. Degree of protection
150	9. Whether wiring numberings as per IS 375

151	10. Type of terminal connector
152	11. A Size of control wires CT CIRCUITS
153	11 B. Size of control wires: OTHER CIRCUITS
154	12. Make and type of MCBs
155	13. Whether equipment identification labels provided
156	14. Whether typical GA drawings enclosed.
157	B. PROTECTIVE RELAYS 1. Make
158	2. Type designation
159	3. Whether numerical or communicable type
160	4. Number of poles (Elements)
161	5. a) 220V and 110V DC
162	5. b) Whether suitable for both
163	6. Relay characteristic
164	7. Time of operation at 10 times current setting.
165	8. Current setting available for O/C element
166	9. Current setting available for E/F element.
167	10. Number of output contacts
168	11. Output contacts rating
169	12. Current rating (Amps)
170	13. Any additional features
171	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
172	14b) If yes, whether the same is offered as optional items
173	C. TRIP RELAYS 1. Make and type designation
174	2. General design
175	3. DC rating (voltage)
176	4. VA Burden
177	5. Operating time
178	6. Number of output contacts
179	7. Type of indications
180	8. Any other details
181	D. AMMETER 1. Make and type designation
182	2. General design (Moving coil)
183	3. Size
184	4. Degree of scale (deflection)
185	2. Size (of face dial)
186	3. Wther TNC type.
187	4. Number of positions
188	5. Number of ways
189	6. Current rating
190	F. SEMAPHORE INDICATOR 1. Make and type designation
191	2. Size (of face dial)
192	3. Rating and consumptions
193	4. Rating and consumptions
194	G. PUSH BUTTONS. 1. Make and type designation
195	2. Momentary contact type/maintained
196	3. Number of contacts
197	4. Colour
198	H. ALARM CANCELLATION RELAY. 1. Make and type designation
199	2. Number of output contacts
200	3. DC voltage and burden
201	4. Type of mounting
202	11KV LA ,10KA, Class2 Name of the Manufacturer
203	Type

204	Reference Standard
205	Model (Drg. No.)
206	No. of Units
207	Rated Voltage
208	Nominal discharge current
209	Reference current
210	Reference voltage
211	Leakage Current at COV
212	Max. continuous operating voltage
213	Max. residual voltage for discharge current of (8/20 micro sec. wave) a) 500 Amps b) 10000 Amps c) 20000 Amps
214	Max. steep front residual voltage at 10KA with one micro sec. rise time
215	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
216	Energy dissipation capability (cumulative of 3 sequential shots)
217	High current 4/10 us. Test value
218	Long duration current tests i) Current peak ii) Virtual duration
219	Pressure relief class
220	Short circuit current capability
221	Partial discharge at 1.05 times MCOV
222	Temporary over voltage withstand a) 0.1 second b) 1.0 second c)10.0 second
223	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
224	Nominal Creepage distance
225	Weight of complete unit
226	Height of complete unit from base to the line side
227	Minimum recommended centre to centre spacing between Arresters
228	Clearance required from ground equipment of various heights of Arrester unit
229	Earthing arrangement provided for earthing side of Arrester
230	Mounting flange dimensional details

ItemCode	**82126010644**
ItemName	**11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+9 F)**
Sr.NO	**GTP Parameters**
1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation
2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)

17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18) Whether manual trip/close possible(Yes/No)
19	19) Whether mechanical spring charging possible (Yes/No)
20	20) Type of material for main/arcing contacts.
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
32	32) Whether type tested in India (Yes/No)
33	II. ISOLATORS - 1) Make and type designation
34	2) Continuous current rating
35	3) Vertical Isolation/Horizontal isolation type
36	4) Spacing bewtween phases
37	5) Creepage distance of insulator
38	6) Voltage rating of insulator
39	7) Whether solenoid mechanism and auxiliary switches provided for interlock
40	8) Height of the HT terminal from nearest metal ground
41	9) Height of the HT terminal from ground level (with support structure)
42	10) Material for moving blade and fixed contacts
43	11) Whether earth switch provided (Yes/No)
44	12a) If earth switch is provided, material of earth blade
45	12b) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA
47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2
53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)
55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core

70	6) Type of bushing and creapage
71	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
72	8) Whether type tested (Yes/No)
73	9) Rated Voltage Factor and Time
74	10) Type of Insulation Housing
75	11) Whether HT fuses provide
76	12) Material used for primary/secondary winding.
77	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
78	2) Multi-function electricity meter(0.2 class) and TTB
79	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
80	4) T.N.C. type control switches for circuit breaker.
81	5) Semophore indications for isolators
82	6a) Indicating lamps for Spring charge indicator (White)
83	6b) Indicating lamps for Trip circuit healthy indication
84	6c) Indicating lamps for CB ON (red)
85	6d) Indicating lamps for CB Off (Green)
86	7a) Push button for Trip circuit test
87	7b) Push button for Alarm accept
88	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.
89	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
90	10) Ammeter selector switch
91	11) Electrical reset type trip relay along with reset push button
92	12) Internally mounted Space heater and control switch
93	13) Internally mounted Cubicle illumination temp and door switch.
94	14) Internally mounted Power plug and control switch
95	15) Internally mounted Alarm cancellation relay
96	16) Internally mounted Alarm Bell
97	17) Internally mounted MCBs links control wiring, etc.
98	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
99	2) Multi-function electricity meter (0.2 Class) and TTB
100	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
101	4)T-N-C type control switches for circuit breaker in number
102	5)Semophore indications for isolators in number
103	6a) Indicating lamps for Spring charge indicator (White)
104	6b) Indicating lamps for Trip circuit healthy indication (Amber)
105	6c)Indicating lamps for CB ON (red)
106	6d)Indicating lamps for CB OFF (green)
107	7a)Push button for Trip circuit test
108	7b)Push button for Alarm accept
109	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
110	9) Ammeter (96 x 96) 240 deg. Scale
111	10) Ammeter selector switch
112	11)Electrical rerset type trip relay with reset B
113	12a)Internally mounted Space heater and control switch
114	12b) Internally mounted Cubicle illumination lamp and door switch.
115	12c) Internally mounted Power plug and control switch
116	12d) Internally mounted Alarm cancellation relay
117	12e) Internally mounted Alarm Bell
118	12f) Internally mounted MCBs links control wiring, etc.
119	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
120	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)

121	3a)T-N-C type control switches for circuit breaker.
122	3b) Semophore indications for isolators
123	4a) Indicating lamps for Spring charge indicator (White)
124	4b)Indicating lamps for Trip circuit healthy indication (amber)
125	4c) Indicating lamps for CB ON (Red)
126	4d) Indicating lamps for CB OFF(Green))
127	5a) Push button for Trip circuit test
128	5b) Push button for Alarm accept
129	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
130	7)Multi function electricity meter 0.2 class and TTB
131	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
132	9)Ammeter selector switch
133	10)Electrical reset type trip relay along with push button
134	11a) Internally mounted Space heater and control switch
135	11b) Internally mounted Cubicle illumination lamp and door switch.
136	11c) Internally mounted Power plug and control switch
137	11d) Internally mounted Alarm cancellation relay
138	11e) Internally mounted Alarm Bell.
139	11f) Internally mounted MCBs links control wiring, etc.
140	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
141	2. Overall dimensions (HXWXD)
142	3. Thickness of sheet steel
143	4. Colour shade
144	5. Mimic shade
145	6. Type of painting
146	7. Whether wiring troughs used
147	8. Degree of protection
148	9. Whether wiring numberings as per IS 375
149	10. Type of terminal connector
150	11. A Size of control wires CT CIRCUITS
151	11 B. Size of control wires: OTHER CIRCUITS
152	12. Make and type of MCBs
153	13. Whether equipment identification labels provided
154	14. Whether typical GA drawings enclosed.
155	B. PROTECTIVE RELAYS 1. Make
156	2. Type designation
157	3. Whether numerical or communicable type
158	4. Number of poles (Elements)
159	5. a) 220V and 110V DC
160	5. b) Whether suitable for both
161	6. Relay characteristic
162	7. Time of operation at 10 times current setting.
163	8. Current setting available for O/C element
164	9. Current setting available for E/F element.
165	10. Number of output contacts
166	11. Output contacts rating
167	12. Current rating (Amps)
168	13. Any additional features
169	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
170	14b) If yes, whether the same is offered as optional items
171	C. TRIP RELAYS 1. Make and type designation
172	2. General design

173	3. DC rating (voltage)
174	4. VA Burden
175	5. Operating time
176	6. Number of output contacts
177	7. Type of indications
178	8. Any other details
179	D. AMMETER 1. Make and type designation
180	2. General design (Moving coil)
181	3. Size
182	4. Degree of scale (deflection)
183	E. BREAKER CONTROL SWITCH: 1. Make and type designation
184	2. Size (of face dial)
185	3. Wther TNC type.
186	4. Number of positions
187	5. Number of ways
188	6. Current rating
189	F. SEMAPHORE INDICATOR 1. Make and type designation
190	2. Size (of face dial)
191	3. Rating and consumptions
192	4. Rating and consumptions
193	G. PUSH BUTTONS. 1. Make and type designation
194	2. Momentary contact type/maintained
195	3. Number of contacts
196	4. Colour
197	H. ALARM CANCELLATION RELAY. 1. Make and type designation
198	2. Number of output contacts
199	3. DC voltage and burden
200	4. Type of mounting
201	11KV LA, 10KA, class2 Name of the Manufacturer
202	Type
203	Reference Standard
204	Model (Drg. No.)
205	No. of Units
206	Rated Voltage
207	Nominal discharge current
208	Reference current
209	Reference voltage
210	Leakage Current at COV
211	Max. continuous operating voltage
212	Max. residual voltage for discharge current of (8/20 micro sec. wave) a) 500 Amps b) 10000 Amps c) 20000 Amps
213	Max. steep front residual voltage at 10KA with one micro sec. rise time
214	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
215	Energy dissipation capability (cumulative of 3 sequential shots)
216	High current 4/10 us. Test value
217	Long duration current tests. i) Current peak ii) Virtual duration
218	Pressure relief class
219	Short circuit current capability
220	Partial discharge at 1.05 times MCOV

221	Temporary over voltage withstand a) 0.1 second b) 1.0 second c) 10.0 second
222	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
223	Nominal Creepage distance
224	Weight of complete unit
225	Height of complete unit from base to the line side
226	Minimum recommended centre to centre spacing between Arresters
227	Clearance required from ground equipment of various heights of Arrester unit
228	Earthing arrangement provided for earthing side of Arrester
229	Mounting flange dimensional details

ItemCode	**82126011534**
ItemName	**11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (1 I/C+0 B/S+8 F)**
Sr.NO	**GTP Parameters**
1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation
2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)
17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18) Whether manual trip/close possible(Yes/No)
19	19) Whether mechanical spring charging possible (Yes/No)
20	20) Type of material for main/arcing contacts.
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
32	32) Whether type tested in India (Yes/No)
33	II. ISOLATORS - 1) Make and type designation
34	2) Continuous current rating
35	3) Vertical Isolation/Horizontal isolation type

36	4) Spacing bewtween phases
37	5) Creepage distance of insulator
38	6) Voltage rating of insulator
39	7) Whether solenoid mechanism and auxiliary switches provided for interlock
40	8) Height of the HT terminal from nearest metal ground
41	9) Height of the HT terminal from ground level (with support structure)
42	10) Material for moving blade and fixed contacts
43	11) Whether earth switch provided (Yes/No)
44	12a) If earth switch is provided, material of earth blade
45	12b) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA
47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2
53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)
55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core
70	6) Type of bushing and creapage
71	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
72	8) Whether type tested (Yes/No)
73	9) Rated Voltage Factor and Time
74	10) Type of Insulation Housing
75	11) Whether HT fuses provide
76	12) Material used for primary/secondary winding.
77	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
78	2) Multi-function electricity meter(0.2 class) and TTB
79	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
80	4) T.N.C. type control switches for circuit breaker.
81	5) Semophore indications for isolators
82	6a)Indicating lamps for Trip circuit healthy indication
83	6b) Indicating lamps for CB ON (red)
84	6c) Indicating lamps for CB Off (Green)
85	7a) Push button for Trip circuit test
86	7b) Push button for Alarm accept
87	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.

88	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
89	10) Ammeter selector switch
90	11) Electrical reset type trip relay along with reset push button
91	12) Internally mounted Space heater and control switch
92	13) Internally mounted Cubicle illumination temp and door switch.
93	14) Internally mounted Power plug and control switch
94	15) Internally mounted Alarm cancellation relay
95	16) Internally mounted Alarm Bell
96	17) Internally mounted MCBs links control wiring, etc.
97	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
98	2) Multi-function electricity meter (0.2 Class) and TTB
99	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
100	4)T-N-C type control switches for circuit breaker in number
101	5)Semophore indications for isolators in number
102	6a) Indicating lamps for Spring charge indicator (White)
103	6b) Indicating lamps for Trip circuit healthy indication (Amber)
104	6c)Indicating lamps for CB ON (red)
105	6d)Indicating lamps for CB OFF (green)
106	7a)Push button for Trip circuit test
107	7b)Push button for Alarm accept
108	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
109	9) Ammeter (96 x 96) 240 deg. Scale
110	10) Ammeter selector switch
111	11)Electrical rerset type trip relay with reset B
112	12a)Internally mounted Space heater and control switch
113	12b) Internally mounted Cubicle illumination lamp and door switch.
114	12c) Internally mounted Power plug and control switch
115	12d) Internally mounted Alarm cancellation relay
116	12e) Internally mounted Alarm Bell
117	12f) Internally mounted MCBs links control wiring, etc.
118	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
119	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
120	3a)T-N-C type control switches for circuit breaker.
121	3a)T-N-C type control switches for circuit breaker.
122	3b) Semophore indications for isolators
123	4a) Indicating lamps for Spring charge indicator (White)
124	4b)Indicating lamps for Trip circuit healthy indication (amber)
125	4c) Indicating lamps for CB ON (Red)
126	4c) Indicating lamps for CB ON (Red)
127	4d) Indicating lamps for CB OFF(Green))
128	5a) Push button for Trip circuit test
129	5b) Push button for Alarm accept
130	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
131	7)Multi function electricity meter 0.2 class and TTB
132	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
133	9)Ammeter selector switch
134	10)Electrical reset type trip relay along with push button
135	11a) Internally mounted Space heater and control switch
136	11b) Internally mounted Cubicle illumination lamp and door switch.
137	11c) Internally mounted Power plug and control switch
138	11d) Internally mounted Alarm cancellation relay
139	11e) Internally mounted Alarm Bell.

140	11f) Internally mounted MCBs links control wiring, etc.
141	11f) Internally mounted MCBs links control wiring, etc.
142	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
143	2. Overall dimensions (HXWXD)
144	3. Thickness of sheet steel
145	4. Colour shade
146	5. Mimic shade
147	6. Type of painting
148	7. Whether wiring troughs used
149	8. Degree of protection
150	9. Whether wiring numberings as per IS 375
151	10. Type of terminal connector
152	11. A Size of control wires CT CIRCUITS
153	11 B. Size of control wires: OTHER CIRCUITS
154	12. Make and type of MCBs
155	13. Whether equipment identification labels provided
156	14. Whether typical GA drawings enclosed.
157	B. PROTECTIVE RELAYS 1. Make
158	2. Type designation
159	3. Whether numerical or communicable type
160	4. Number of poles (Elements)
161	5. a) 220V and 110V DC
162	5. b) Whether suitable for both
163	6. Relay characteristic
164	7. Time of operation at 10 times current setting.
165	8. Current setting available for O/C element
166	9. Current setting available for E/F element.
167	10. Number of output contacts
168	11. Output contacts rating
169	12. Current rating (Amps)
170	13. Any additional features
171	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
172	14b) If yes, whether the same is offered as optional items
173	C. TRIP RELAYS 1. Make and type designation
174	2. General design
175	3. DC rating (voltage)
176	4. VA Burden
177	5. Operating time
178	6. Number of output contacts
179	7. Type of indications
180	8. Any other details
181	D. AMMETER 1. Make and type designation
182	2. General design (Moving coil)
183	3. Size
184	4. Degree of scale (deflection)
185	2. Size (of face dial)
186	3. Wther TNC type.
187	4. Number of positions
188	5. Number of ways
189	6. Current rating
190	F. SEMAPHORE INDICATOR 1. Make and type designation
191	2. Size (of face dial)
192	3. Rating and consumptions

193	4. Rating and consumptions
194	G. PUSH BUTTONS. 1. Make and type designation
195	2. Momentary contact type/maintained
196	3. Number of contacts
197	4. Colour
198	H. ALARM CANCELLATION RELAY. 1. Make and type designation
199	2. Number of output contacts
200	3. DC voltage and burden
201	4. Type of mounting
202	11KV LA, 10KA, class2 Name of the Manufacturer
203	Type
204	Reference Standard
205	Model (Drg. No.)
206	No. of Units
207	Rated Voltage
208	Nominal discharge current
209	Reference current
210	Reference voltage
211	Leakage Current at COV
212	Max. continuous operating voltage
213	Max. residual voltage for discharge current of (8/20 micro sec. wave) a) 500 Amps b) 10000 Amps c) 20000 Amps
214	Max. steep front residual voltage at 10KA with one micro sec. rise time
215	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
216	Energy dissipation capability (cumulative of 3 sequential shots)
217	High current 4/10 us. Test value
218	Long duration current tests. i) Current peak ii) Virtual duration
219	Pressure relief class
220	Short circuit current capability
221	Partial discharge at 1.05 times MCOV
222	Temporary over voltage withstand a) 0.1 second b) 1.0 second c) 10.0 second
223	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
224	Nominal Creepage distance
225	Weight of complete unit
226	Height of complete unit from base to the line side
227	Minimum recommended centre to centre spacing between Arresters
228	Clearance required from ground equipment of various heights of Arrester unit
229	Earthing arrangement provided for earthing side of Arrester
230	Mounting flange dimensional details

ItemCode	**82126011614**
ItemName	**11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+5 F)**
Sr.NO	**GTP Parameters**

1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation
2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)
17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18) Whether manual trip/close possible(Yes/No)
19	19) Whether mechanical spring charging possible (Yes/No)
20	20) Type of material for main/arcing contacts.
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
32	32) Whether type tested in India (Yes/No)
33	II. ISOLATORS - 1) Make and type designation
34	2) Continuous current rating
35	3) Vertical Isolation/Horizontal isolation type
36	4) Spacing bewtween phases
37	5) Creepage distance of insulator
38	6) Voltage rating of insulator
39	7) Whether solenoid mechanism and auxiliary switches provided for interlock
40	8) Height of the HT terminal from nearest metal ground
41	9) Height of the HT terminal from ground level (with support structure)
42	10) Material for moving blade and fixed contacts
43	11) Whether earth switch provided (Yes/No)
44	12a) If earth switch is provided, material of earth blade
45	12b) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA
47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2

53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)
55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core
70	6) Type of bushing and creapage
71	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
72	8) Whether type tested (Yes/No)
73	9) Rated Voltage Factor and Time
74	10) Type of Insulation Housing
75	11) Whether HT fuses provide
76	12) Material used for primary/secondary winding.
77	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
78	2) Multi-function electricity meter(0.2 class) and TTB
79	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
80	4) T.N.C. type control switches for circuit breaker.
81	5) Semophore indications for isolators
82	6a)Indicating lamps for Trip circuit healthy indication
83	6b) Indicating lamps for CB ON (red)
84	6c) Indicating lamps for CB Off (Green)
85	7a) Push button for Trip circuit test
86	7b) Push button for Alarm accept
87	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.
88	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
89	10) Ammeter selector switch
90	11) Electrical reset type trip relay along with reset push button
91	12) Internally mounted Space heater and control switch
92	13) Internally mounted Cubicle illumination temp and door switch.
93	14) Internally mounted Power plug and control switch
94	15) Internally mounted Alarm cancellation relay
95	16) Internally mounted Alarm Bell
96	17) Internally mounted MCBs links control wiring, etc.
97	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
98	2) Multi-function electricity meter (0.2 Class) and TTB
99	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
100	4)T-N-C type control switches for circuit breaker in number
101	5)Semophore indications for isolators in number
102	6a) Indicating lamps for Spring charge indicator (White)
103	6b) Indicating lamps for Trip circuit healthy indication (Amber)
104	6c)Indicating lamps for CB ON (red)

105	6d)Indicating lamps for CB OFF (green)
106	7a)Push button for Trip circuit test
107	7b)Push button for Alarm accept
108	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
109	9) Ammeter (96 x 96) 240 deg. Scale
110	10) Ammeter selector switch
111	11)Electrical rerset type trip relay with reset B
112	12a)Internally mounted Space heater and control switch
113	12b) Internally mounted Cubicle illumination lamp and door switch.
114	12c) Internally mounted Power plug and control switch
115	12d) Internally mounted Alarm cancellation relay
116	12e) Internally mounted Alarm Bell
117	12f) Internally mounted MCBs links control wiring, etc.
118	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
119	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
120	3a)T-N-C type control switches for circuit breaker.
121	3a)T-N-C type control switches for circuit breaker.
122	3b) Semophore indications for isolators
123	4a) Indicating lamps for Spring charge indicator (White)
124	4b)Indicating lamps for Trip circuit healthy indication (amber)
125	4c) Indicating lamps for CB ON (Red)
126	4c) Indicating lamps for CB ON (Red)
127	4d) Indicating lamps for CB OFF(Green))
128	5a) Push button for Trip circuit test
129	5b) Push button for Alarm accept
130	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
131	7)Multi function electricity meter 0.2 class and TTB
132	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
133	9)Ammeter selector switch
134	10)Electrical reset type trip relay along with push button
135	11a) Internally mounted Space heater and control switch
136	11b) Internally mounted Cubicle illumination lamp and door switch.
137	11c) Internally mounted Power plug and control switch
138	11d) Internally mounted Alarm cancellation relay
139	11e) Internally mounted Alarm Bell.
140	11f) Internally mounted MCBs links control wiring, etc.
141	11f) Internally mounted MCBs links control wiring, etc.
142	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
143	2. Overall dimensions (HXWXD)
144	3. Thickness of sheet steel
145	4. Colour shade
146	5. Mimic shade
147	6. Type of painting
148	7. Whether wiring troughs used
149	8. Degree of protection
150	9. Whether wiring numberings as per IS 375
151	10. Type of terminal connector
152	11. A Size of control wires CT CIRCUITS
153	11 B. Size of control wires: OTHER CIRCUITS
154	12. Make and type of MCBs
155	13. Whether equipment identification labels provided
156	14. Whether typical GA drawings enclosed.

157	B. PROTECTIVE RELAYS 1. Make
158	2. Type designation
159	3. Whether numerical or communicable type
160	4. Number of poles (Elements)
161	5. a) 220V and 110V DC
162	5. b) Whether suitable for both
163	6. Relay characteristic
164	7. Time of operation at 10 times current setting.
165	8. Current setting available for O/C element
166	9. Current setting available for E/F element.
167	10. Number of output contacts
168	11. Output contacts rating
169	12. Current rating (Amps)
170	13. Any additional features
171	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
172	14b) If yes, whether the same is offered as optional items
173	C. TRIP RELAYS 1. Make and type designation
174	2. General design
175	3. DC rating (voltage)
176	4. VA Burden
177	5. Operating time
178	6. Number of output contacts
179	7. Type of indications
180	8. Any other details
181	D. AMMETER 1. Make and type designation
182	2. General design (Moving coil)
183	3. Size
184	4. Degree of scale (deflection)
185	2. Size (of face dial)
186	3. Wther TNC type.
187	4. Number of positions
188	5. Number of ways
189	6. Current rating
190	F. SEMAPHORE INDICATOR 1. Make and type designation
191	2. Size (of face dial)
192	3. Rating and consumptions
193	4. Rating and consumptions
194	G. PUSH BUTTONS. 1. Make and type designation
195	2. Momentary contact type/maintained
196	3. Number of contacts
197	4. Colour
198	H. ALARM CANCELLATION RELAY. 1. Make and type designation
199	2. Number of output contacts
200	3. DC voltage and burden
201	4. Type of mounting
202	11KV LA,10KA,Class 2 Name of the Manufacturer
203	Type
204	Reference Standard
205	Model (Drg. No.)
206	No. of Units
207	Rated Voltage
208	Nominal discharge current
209	Reference current

210	Reference voltage
211	Leakage Current at COV
212	Max. continuous operating voltage
213	Max. residual voltage for discharge current of (8/20 micro sec. wave) a) 500 Amps b) 10000 Amps c) 20000 Amps
214	Max. steep front residual voltage at 10KA with one micro sec. rise time
215	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
216	Energy dissipation capability (cumulative of 3 sequential shots)
217	High current 4/10 us. Test value
218	Long duration current tests. i) Current peak ii) Virtual duration
219	Pressure relief class
220	Short circuit current capability
221	Partial discharge at 1.05 times MCOV
222	Temporary over voltage withstand a) 0.1 second b) 1.0 second c) 10.0 second
223	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
224	Nominal Creepage distance
225	Weight of complete unit
226	Height of complete unit from base to the line side
227	Minimum recommended centre to centre spacing between Arresters
228	Clearance required from ground equipment of various heights of Arrester unit
229	Earthing arrangement provided for earthing side of Arrester
230	Mounting flange dimensional details

ItemCode	**82126010304**
ItemName	**11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+12 F)**
Sr.NO	**GTP Parameters**
1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation
2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)
17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18) Whether manual trip/close possible(Yes/No)

19	19) Whether mechanical spring charging possible (Yes/No)
20	20) Type of material for main/arcing contacts.
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	30) Height of HT terminal from ground level (with support structure)
32	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
33	32) Whether type tested in India (Yes/No)
34	II. ISOLATORS - 1) Make and type designation
35	2) Continuous current rating
36	3) Vertical Isolation/Horizontal isolation type
37	4) Spacing bewtween phases
38	5) Creepage distance of insulator
39	6) Voltage rating of insulator
40	7) Whether solenoid mechanism and auxiliary switches provided for interlock
41	8) Height of the HT terminal from nearest metal ground
42	9) Height of the HT terminal from ground level (with support structure)
43	10) Material for moving blade and fixed contacts
44	11) Whether earth switch provided (Yes/No)
45	12) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA
47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2
53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)
55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core
70	6) Type of bushing and creapage

71	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
72	8) Whether type tested (Yes/No)
73	9) Rated Voltage Factor and Time
74	10) Type of Insulation Housing
75	11) Whether HT fuses provide
76	12) Material used for primary/secondary winding.
77	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
78	2) Multi-function electricity meter(0.2 class) and TTB
79	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
80	4) T.N.C. type control switches for circuit breaker.
81	5) Semophore indications for isolators
82	6a) Indicating lamps for Spring charge indicator (White)
83	6b) Indicating lamps for Trip circuit healthy indication
84	6c) Indicating lamps for CB ON (red)
85	6d) Indicating lamps for CB Off (Green)
86	7a) Push button for Trip circuit test
87	7b) Push button for Alarm accept
88	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.
89	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
90	10) Ammeter selector switch
91	11) Electrical reset type trip relay along with reset push button
92	12) Internally mounted Space heater and control switch
93	13) Internally mounted Cubicle illumination temp and door switch.
94	14) Internally mounted Power plug and control switch
95	15) Internally mounted Alarm cancellation relay
96	16) Internally mounted Alarm Bell
97	17) Internally mounted MCBs links control wiring, etc.
98	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
99	2) Multi-function electricity meter (0.2 Class) and TTB
100	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
101	4)T-N-C type control switches for circuit breaker in number
102	5)Semophore indications for isolators in number
103	6a) Indicating lamps for Spring charge indicator (White)
104	6b) Indicating lamps for Trip circuit healthy indication (Amber)
105	6c)Indicating lamps for CB ON (red)
106	6d)Indicating lamps for CB OFF (green)
107	7a)Push button for Trip circuit test
108	7b)Push button for Alarm accept
109	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
110	9) Ammeter (96 x 96) 240 deg. Scale
111	10) Ammeter selector switch
112	11)Electrical rerset type trip relay with reset B
113	12a)Internally mounted Space heater and control switch
114	12b) Internally mounted Cubicle illumination lamp and door switch.
115	12c) Internally mounted Power plug and control switch
116	12d) Internally mounted Alarm cancellation relay
117	12e) Internally mounted Alarm Bell
118	12f) Internally mounted MCBs links control wiring, etc.
119	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
120	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
121	3a)T-N-C type control switches for circuit breaker.

122	3b) Semophore indications for isolators
123	4a) Indicating lamps for Spring charge indicator (White)
124	4b)Indicating lamps for Trip circuit healthy indication (amber)
125	4c) Indicating lamps for CB ON (Red)
126	4d) Indicating lamps for CB OFF(Green))
127	5a) Push button for Trip circuit test
128	5b) Push button for Alarm accept
129	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
130	7)Multi function electricity meter 0.2 class and TTB
131	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
132	9)Ammeter selector switch
133	10)Electrical reset type trip relay along with push button
134	11a) Internally mounted Space heater and control switch
135	11b) Internally mounted Cubicle illumination lamp and door switch.
136	11c) Internally mounted Power plug and control switch
137	11d) Internally mounted Alarm cancellation relay
138	11e) Internally mounted Alarm Bell.
139	11f) Internally mounted MCBs links control wiring, etc.
140	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
141	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
142	2. Overall dimensions (HXWXD)
143	3. Thickness of sheet steel
144	4. Colour shade
145	5. Mimic shade
146	6. Type of painting
147	7. Whether wiring troughs used
148	8. Degree of protection
149	9. Whether wiring numberings as per IS 375
150	10. Type of terminal connector
151	11. A Size of control wires CT CIRCUITS
152	11 B. Size of control wires: OTHER CIRCUITS
153	12. Make and type of MCBs
154	13. Whether equipment identification labels provided
155	14. Whether typical GA drawings enclosed.
156	B. PROTECTIVE RELAYS 1. Make
157	2. Type designation
158	3. Whether numerical or communicable type
159	4. Number of poles (Elements)
160	5. a) 220V and 110V DC
161	5. b) Whether suitable for both
162	6. Relay characteristic
163	7. Time of operation at 10 times current setting.
164	8. Current setting available for O/C element
165	9. Current setting available for E/F element.
166	10. Number of output contacts
167	11. Output contacts rating
168	12. Current rating (Amps)
169	13. Any additional features
170	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
171	14b) If yes, whether the same is offered as optional items
172	C. TRIP RELAYS 1. Make and type designation
173	2. General design

174	3. DC rating (voltage)
175	4. VA Burden
176	5. Operating time
177	6. Number of output contacts
178	7. Type of indications
179	8. Any other details
180	D. AMMETER 1. Make and type designation
181	2. General design (Moving coil)
182	3. Size
183	4. Degree of scale (deflection)
184	E. BREAKER CONTROL SWITCH: 1. Make and type designation
185	2. Size (of face dial)
186	3. Wther TNC type.
187	4. Number of positions
188	5. Number of ways
189	6. Current rating
190	F. SEMAPHORE INDICATOR 1. Make and type designation
191	2. Size (of face dial)
192	3. Rating and consumptions
193	4. Rating and consumptions
194	G. PUSH BUTTONS. 1. Make and type designation
195	2. Momentary contact type/maintained
196	3. Number of contacts
197	4. Colour
198	H. ALARM CANCELLATION RELAY. 1. Make and type designation
199	3. DC voltage and burden
200	4. Type of mounting
201	11KV LA ,10KA, Class2 Name of the Manufacturer
202	Type
203	Reference Standard
204	Model (Drg. No.)
205	No. of Units
206	Rated Voltage
207	Nominal discharge current
208	Reference current
209	Reference voltage
210	Leakage Current at COV
211	Max. continuous operating voltage
212	Max. residual voltage for discharge current of (8/20 micro sec. wave)a) 500 Amps b) 10000 Amps c) 20000 Amps
213	Max. steep front residual voltage at 10KA with one micro sec. rise time
214	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
215	Energy dissipation capability (cumulative of 3 sequential shots)
216	High current 4/10 us. Test value
217	Long duration current tests. i) Current peak ii) Virtual duration
218	Pressure relief class
219	Short circuit current capability
220	Partial discharge at 1.05 times MCOV

221	Temporary over voltage withstand a) 0.1 second b) 1.0 second c) 10.0 second
222	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
223	Nominal Creepage distance
224	Weight of complete unit
225	Height of complete unit from base to the line side
226	Minimum recommended centre to centre spacing between Arresters
227	Clearance required from ground equipment of various heights of Arrester unit
228	Earthing arrangement provided for earthing side of Arrester
229	Mounting flange dimensional details

ItemCode	**82126010484**
ItemName	**11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (2 I/C+1 B/S+10 F)**
Sr.NO	**GTP Parameters**
1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation
2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)
17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18)Whether mechanical spring charging possible (Yes/No)
19	19) Type of material for main/arcing contacts.
20	21) Whether electrical anti pumping device provided (Yes/No)
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
32	32) Whether type tested in India (Yes/No)
33	II. ISOLATORS - 1) Make and type designation
34	2) Continuous current rating
35	3) Vertical Isolation/Horizontal isolation type

36	4) Spacing bewtween phases
37	5) Creepage distance of insulator
38	6) Voltage rating of insulator
39	7) Whether solenoid mechanism and auxiliary switches provided for interlock
40	8) Height of the HT terminal from nearest metal ground
41	9) Height of the HT terminal from ground level (with support structure)
42	10) Material for moving blade and fixed contacts
43	11) Whether earth switch provided (Yes/No)
44	12a) If earth switch is provided, material of earth blade
45	12b) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA
47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2
53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)
55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core
70	6) Type of bushing and creapage
71	6) Type of bushing and creapage
72	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
73	8) Whether type tested (Yes/No)
74	9) Rated Voltage Factor and Time
75	10) Type of Insulation Housing
76	11) Whether HT fuses provide
77	12) Material used for primary/secondary winding.
78	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
79	2) Multi-function electricity meter(0.2 class) and TTB
80	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
81	4) T.N.C. type control switches for circuit breaker.
82	5) Semophore indications for isolators
83	6a) Indicating lamps for Spring charge indicator (White)
84	6b) Indicating lamps for Trip circuit healthy indication
85	6c) Indicating lamps for CB ON (red)
86	6d) Indicating lamps for CB Off (Green)
87	7a) Push button for Trip circuit test

88	7b) Push button for Alarm accept
89	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.
90	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
91	10) Ammeter selector switch
92	11) Electrical reset type trip relay along with reset push button
93	12) Internally mounted Space heater and control switch
94	13) Internally mounted Cubicle illumination temp and door switch.
95	14) Internally mounted Power plug and control switch
96	15) Internally mounted Alarm cancellation relay
97	16) Internally mounted Alarm Bell
98	17) Internally mounted MCBs links control wiring, etc.
99	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
100	2) Multi-function electricity meter (0.2 Class) and TTB
101	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
102	4)T-N-C type control switches for circuit breaker in number
103	5)Semophore indications for isolators in number
104	6a) Indicating lamps for Spring charge indicator (White)
105	6b) Indicating lamps for Trip circuit healthy indication (Amber)
106	6c)Indicating lamps for CB ON (red)
107	6d)Indicating lamps for CB OFF (green)
108	7a)Push button for Trip circuit test
109	7b)Push button for Alarm accept
110	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
111	9) Ammeter (96 x 96) 240 deg. Scale
112	10) Ammeter selector switch
113	11)Electrical rerset type trip relay with reset B
114	12a)Internally mounted Space heater and control switch
115	12b) Internally mounted Cubicle illumination lamp and door switch.
116	12c) Internally mounted Power plug and control switch
117	12d) Internally mounted Alarm cancellation relay
118	12e) Internally mounted Alarm Bell
119	12f) Internally mounted MCBs links control wiring, etc.
120	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
121	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
122	3a)T-N-C type control switches for circuit breaker.
123	3b) Semophore indications for isolators
124	4a) Indicating lamps for Spring charge indicator (White)
125	4b)Indicating lamps for Trip circuit healthy indication (amber)
126	4c) Indicating lamps for CB ON (Red)
127	4d) Indicating lamps for CB OFF(Green))
128	5a) Push button for Trip circuit test
129	5b) Push button for Alarm accept
130	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
131	7)Multi function electricity meter 0.2 class and TTB
132	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
133	9)Ammeter selector switch
134	10)Electrical reset type trip relay along with push button
135	11a) Internally mounted Space heater and control switch
136	11b) Internally mounted Cubicle illumination lamp and door switch.
137	11c) Internally mounted Power plug and control switch
138	11d) Internally mounted Alarm cancellation relay
139	11e) Internally mounted Alarm Bell.

140	11f) Internally mounted MCBs links control wiring, etc.
141	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
142	2. Overall dimensions (HXWXD)
143	3. Thickness of sheet steel
144	4. Colour shade
145	5. Mimic shade
146	6. Type of painting
147	7. Whether wiring troughs used
148	8. Degree of protection
149	9. Whether wiring numberings as per IS 375
150	10. Type of terminal connector
151	11. A Size of control wires CT CIRCUITS
152	11 B. Size of control wires: OTHER CIRCUITS
153	12. Make and type of MCBs
154	13. Whether equipment identification labels provided
155	14. Whether typical GA drawings enclosed.
156	B. PROTECTIVE RELAYS 1. Make
157	2. Type designation
158	3. Whether numerical or communicable type
159	4. Number of poles (Elements)
160	5. a) 220V and 110V DC
161	5. b) Whether suitable for both
162	6. Relay characteristic
163	7. Time of operation at 10 times current setting.
164	8. Current setting available for O/C element
165	9. Current setting available for E/F element.
166	10. Number of output contacts
167	11. Output contacts rating
168	12. Current rating (Amps)
169	13. Any additional features
170	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
171	14b) If yes, whether the same is offered as optional items
172	C. TRIP RELAYS 1. Make and type designation
173	2. General design
174	3. DC rating (voltage)
175	4. VA Burden
176	5. Operating time
177	6. Number of output contacts
178	7. Type of indications
179	8. Any other details
180	D. AMMETER 1. Make and type designation
181	2. General design (Moving coil)
182	3. Size
183	4. Degree of scale (deflection)
184	E. BREAKER CONTROL SWITCH: 1. Make and type designation
185	2. Size (of face dial)
186	3. Wther TNC type.
187	4. Number of positions
188	5. Number of ways
189	6. Current rating
190	F. SEMAPHORE INDICATOR 1. Make and type designation
191	2. Size (of face dial)
192	3. Rating and consumptions

193	4. Rating and consumptions
194	G. PUSH BUTTONS. 1. Make and type designation
195	2. Momentary contact type/maintained
196	3. Number of contacts
197	4. Colour
198	H. ALARM CANCELLATION RELAY. 1. Make and type designation
199	2. Number of output contacts
200	3. DC voltage and burden
201	4. Type of mounting
202	11KV LA, 10KA, Class2 Name of the Manufacturer
203	Type
204	Reference Standard
205	Model (Drg. No.)
206	No. of Units
207	Rated Voltage
208	Nominal discharge current
209	Reference current
210	Reference voltage
211	Leakage Current at COV
212	Max. continuous operating voltage
213	Max. residual voltage for discharge current of (8/20 micro sec. wave) a) 500 Amps b) 10000 Amps c) 20000 Amps
214	Max. steep front residual voltage at 10KA with one micro sec. rise time
215	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
216	Energy dissipation capability (cumulative of 3 sequential shots)
217	High current 4/10 us. Test value
218	Long duration current tests. i) Current peak ii) Virtual duration
219	Pressure relief class
220	Short circuit current capability
221	Partial discharge at 1.05 times MCOV
222	Temporary over voltage withstand a) 0.1 second b) 1.0 second c) 10.0 second
223	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
224	Nominal Creepage distance
225	Weight of complete unit
226	Height of complete unit from base to the line side
227	Minimum recommended centre to centre spacing between Arresters
228	Clearance required from ground equipment of various heights of Arrester unit
229	Earthing arrangement provided for earthing side of Arrester
230	Mounting flange dimensional details

ItemCode	**82126011374**
ItemName	**11KV 25KA OUTDOOR SWITCHGEAR WITH REMOTE INDOOR C&R PANELS COMPRISING OF (1 I/C+0 B/S+6 F)**
Sr.NO	**GTP Parameters**
1	I. CIRCUIT BREAKER (OUTDOOR) WITH SPRING CHARGE MECHANISM - 1) Make and Type designation

2	2) whether porecelain clad.
3	3) Type of interrupter (Vacuum)
4	4) Number of poles
5	5) Rated voltage and frequency
6	6) Maximum continuous voltage
7	7) Rated continuous current
8	8) Rated symmetrical short circuit breaking current (3 seconds) in kA (RMS).
9	9) Equivalent MVA
10	10) Rated symmetrical short circuit breaking current in kA (Peak).
11	11) Power and frequency withstand voltage.
12	12) Impulse withstand voltage
13	13) Number of interruption at rated current
14	14) Number of interruption at short circuit current.
15	15) Type of closing mechanism (rating also to be stated)
16	16) Type of tripping mechanism (rating also to be stated)
17	17) Whether mechanical ON/OFF and "spring charged" indications available.
18	18) Whether manual trip/close possible(Yes/No)
19	19) Whether mechanical spring charging possible (Yes/No)
20	20) Type of material for main/arcing contacts.
21	21) Whether electrical anti pumping device provided (Yes/No)
22	22) Whether indicator provided for checking contact wear (Yes/No)
23	23) Number of auxiliary contacts
24	24) Whether any contact multiplier used, and if so, details (Yes/No)
25	25) No.of auxiliary contact available for use in remote C&R Panels.
26	26) Whether potential free contacts available for remore indication of "spring charged". (Yes/No)
27	27) Clearance between phase
28	28) Clearance between phase and earth
29	29) Height of live HT terminal from nearest grounded level with support structure
30	30) Height of HT terminal from ground level (with support structure)
31	31) Whether CTs/PTs mounted on the CB support structure (Yes/No)
32	32) Whether type tested in India (Yes/No)
33	II. ISOLATORS - 1) Make and type designation
34	2) Continuous current rating
35	3) Vertical Isolation/Horizontal isolation type
36	4) Spacing bewtween phases
37	5) Creepage distance of insulator
38	6) Voltage rating of insulator
39	7) Whether solenoid mechanism and auxiliary switches provided for interlock
40	8) Height of the HT terminal from nearest metal ground
41	9) Height of the HT terminal from ground level (with support structure)
42	10) Material for moving blade and fixed contacts
43	11) Whether earth switch provided (Yes/No)
44	12a) If earth switch is provided, material of earth blade
45	12b) If earth switch is provided, whether mechanical interlock between main and earth blades provided (Yes/No)
46	13) Rated (1Sec.) short circuit withstand in KA
47	14) Whether type tested. (Yes/No)
48	III. CURRENT TRANSFORMERS - 1) Make and type designation
49	2) Ratio
50	3) Number of secondary cores
51	4a) VA Burden and Accuracy class - Core 1
52	4b) VA Burden and Accuracy class - Core 2
53	4c) VA Burden and Accuracy class - Core 3
54	5) Knee point voltage (for 3 Core)

55	6) Material used for primary/secondary winding.
56	7) 1 Second short circuit withstand rating in KA
57	8) Whether separate mounting structure opffered for each pole (for outdoor)
58	9a) Clearances - Phase to Phase
59	9b) Clearances - Phase to Ground
60	10) Height of HT terminal from ground level (with support structure for outdoor)
61	11) Whether type tested (Yes/No)
62	12) Creepage distance and voltage rating of bushings.
63	13) Type of insulation housing
64	14) Whether Live Tank or Dead Tank Type (in case of outdoor CTs.)
65	IV. POTENTIAL TRANSFORMER - 1) Make and type designation
66	2) Whether single phase units (Yes/No)
67	3) Voltage Ratio
68	4) Number of secondary cores
69	5) VA burden and accuracy of each core
70	6) Type of bushing and creapage
71	7) Height of HT terminal from nearest grounded metal part level (With support structure for outdoor)
72	8) Whether type tested (Yes/No)
73	9) Rated Voltage Factor and Time
74	10) Type of Insulation Housing
75	11) Whether HT fuses provide
76	12) Material used for primary/secondary winding.
77	V. 11KV INCOMER CONTROL PANEL - MAKE & TYPE DESIGN OF FOLLOWING MATERIALS - 1) Circuit Label
78	2) Multi-function electricity meter(0.2 class) and TTB
79	3) Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
80	4) T.N.C. type control switches for circuit breaker.
81	5) Semophore indications for isolators
82	6a) Indicating lamps for Spring charge indicator (White)
83	6b) Indicating lamps for Trip circuit healthy indication
84	6c) Indicating lamps for CB ON (red)
85	6d) Indicating lamps for CB Off (Green)
86	7a) Push button for Trip circuit test
87	7b) Push button for Alarm accept
88	8) Fully Programmable numerical directional over current and earth fault relay with highest trip feature and built in LBB Function.
89	9) Ammeter (96x96 Sq.mm.), 240 deg. Scale)
90	10) Ammeter selector switch
91	11) Electrical reset type trip relay along with reset push button
92	13) Internally mounted Cubicle illumination temp and door switch.
93	14) Internally mounted Power plug and control switch
94	15) Internally mounted Alarm cancellation relay
95	16) Internally mounted Alarm Bell
96	17) Internally mounted MCBs links control wiring, etc.
97	VI. 11KV BUS SECTIONALIZER CONTROL PANEL (SINGLE) - MAKE & TYPE DESIGN OF FOLLOWING ITEMS - 1) Circuit Label
98	2) Multi-function electricity meter (0.2 Class) and TTB
99	3) Mimic section (Traffic yellow paint to shade No.358 of IS 5 to be used)
100	4)T-N-C type control switches for circuit breaker in number
101	5)Semophore indications for isolators in number
102	6a) Indicating lamps for Spring charge indicator (White)
103	6b) Indicating lamps for Trip circuit healthy indication (Amber)
104	6c)Indicating lamps for CB ON (red)
105	6d)Indicating lamps for CB OFF (green)
106	7a)Push button for Trip circuit test

107	7b)Push button for Alarm accept
108	8)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB.
109	9) Ammeter (96 x 96) 240 deg. Scale
110	10) Ammeter selector switch
111	11)Electrical rerset type trip relay with reset B
112	12a)Internally mounted Space heater and control switch
113	12b) Internally mounted Cubicle illumination lamp and door switch.
114	12c) Internally mounted Power plug and control switch
115	12d) Internally mounted Alarm cancellation relay
116	12e) Internally mounted Alarm Bell
117	12f) Internally mounted MCBs links control wiring, etc.
118	VII. BILL OS MATERIALS FOR 11kV Double Feeder combined C&R Panels 1)Circuit Label
119	2)Mimic section (Traffic yellow paint to shade No.368 of IS 5 to be used)
120	3a)T-N-C type control switches for circuit breaker.
121	3b) Semophore indications for isolators
122	4a) Indicating lamps for Spring charge indicator (White)
123	4b)Indicating lamps for Trip circuit healthy indication (amber)
124	4c) Indicating lamps for CB ON (Red)
125	4d) Indicating lamps for CB OFF(Green))
126	5a) Push button for Trip circuit test
127	5b) Push button for Alarm accept
128	6)Fully Programmable numerical non directional over current and earth fault relay with highest trip feature and built in LBB function.
129	7)Multi function electricity meter 0.2 class and TTB
130	8)Ammeter (96 x 96) Sq.mm., 240 deg. Scale.
131	9)Ammeter selector switch
132	10)Electrical reset type trip relay along with push button
133	11a) Internally mounted Space heater and control switch
134	11b) Internally mounted Cubicle illumination lamp and door switch.
135	11c) Internally mounted Power plug and control switch
136	11d) Internally mounted Alarm cancellation relay
137	11e) Internally mounted Alarm Bell.
138	11f) Internally mounted MCBs links control wiring, etc.
139	VIII. GTP OF ASSOCIATED REMOVED C&R INDOOR PANNEL. A. PANEL 1. Make of panel (Name of bidder)
140	2. Overall dimensions (HXWXD)
141	3. Thickness of sheet steel
142	4. Colour shade
143	5. Mimic shade
144	6. Type of painting
145	7. Whether wiring troughs used
146	8. Degree of protection
147	9. Whether wiring numberings as per IS 375
148	10. Type of terminal connector
149	11. A Size of control wires CT CIRCUITS
150	11 B. Size of control wires: OTHER CIRCUITS
151	12. Make and type of MCBs
152	13. Whether equipment identification labels provided
153	14. Whether typical GA drawings enclosed.
154	B. PROTECTIVE RELAYS 1. Make
155	2. Type designation
156	3. Whether numerical or communicable type
157	4. Number of poles (Elements)
158	5. a) 220V and 110V DC

159	5. b) Whether suitable for both
160	6. Relay characteristic
161	7. Time of operation at 10 times current setting.
162	8. Current setting available for O/C element
163	9. Current setting available for E/F element.
164	10. Number of output contacts
165	11. Output contacts rating
166	12. Current rating (Amps)
167	13. Any additional features
168	14a) Whether any special equipment /tools required for tesrting/maintenance of the relay (applicable for station/microprocessor based relay only)
169	14b) If yes, whether the same is offered as optional items
170	C. TRIP RELAYS 1. Make and type designation
171	2. General design
172	3. DC rating (voltage)
173	4. VA Burden
174	5. Operating time
175	6. Number of output contacts
176	7. Type of indications
177	8. Any other details
178	D. AMMETER 1. Make and type designation
179	2. General design (Moving coil)
180	3. Size
181	4. Degree of scale (deflection)
182	E. BREAKER CONTROL SWITCH: 1. Make and type designation
183	2. Size (of face dial)
184	3. Wther TNC type.
185	4. Number of positions
186	5. Number of ways
187	6. Current rating
188	F. SEMAPHORE INDICATOR 1. Make and type designation
189	2. Size (of face dial)
190	3. Rating and consumptions
191	4. Rating and consumptions
192	G. PUSH BUTTONS. 1. Make and type designation
193	2. Momentary contact type/maintained
194	3. Number of contacts
195	4. Colour
196	H. ALARM CANCELLATION RELAY. 1. Make and type designation
197	2. Number of output contacts
198	3. DC voltage and burden
199	4. Type of mounting
200	11KV LA, 10KA, Class2 Name of the Manufacturer
201	Type
202	Reference Standard
203	Model (Drg. No.)
204	No. of Units
205	Rated Voltage
206	Nominal discharge current
207	Reference current
208	Reference voltage
209	Leakage Current at COV
210	Max. continuous operating voltage

211	Max. residual voltage for discharge current of (8/20 micro sec. wave)a) 500 Amps b) 10000 Amps c) 20000 Amps
212	Max. steep front residual voltage at 10KA with one micro sec. rise time
213	Max. switching impulse residual voltage with 40/80 us. Wave at 500 Amps.
214	Energy dissipation capability (cumulative of 3 sequential shots)
215	High current 4/10 us. Test value
216	Long duration current tests. i) Current peak ii) Virtual duration
217	Pressure relief class
218	Short circuit current capability
219	Partial discharge at 1.05 times MCOV
220	Temporary over voltage withstand a) 0.1 second b) 1.0 second c) 10.0 second
221	Insulation withstand strength of Arrester housing i) One minute 50 Hz. dry & wet ii) Lightning impulse voltage withstand
222	Nominal Creepage distance
223	Weight of complete unit
224	Height of complete unit from base to the line side
225	Minimum recommended centre to centre spacing between Arresters
226	Clearance required from ground equipment of various heights of Arrester unit
227	Earthing arrangement provided for earthing side of Arrester
228	Mounting flange dimensional details