THE FERTILISERS AND CHEMICALS TRAVANCORE LTD.
(A Govt. of India Enterprises)
CORPORATE MATERIALS
PD Administrative Building,
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NOTICE INVITING GeM- TENDER

TENDER No. MM/172/G30501 dt. 14.01.2025

FACT INVITES ONLINE BIDS FROM eligible vendors for the Supply of 11 kV , 1250A, 31.5kA,24 panel Switch Board for Central Substation, fully conforming to the attached Technical Procurement Specification .

Description	
Quantity	01 No.
Nature of Bidding	Two Part Bidding: (Through GeM) 1st Part : Techno Commercial Bid 2 nd Part : Price Bid
Bid Validity	120 days from the date of Opening of Tender
Price Bid Opening Date	Techno Commercially qualified Tenderers only will be intimated
Scope of Work	Design, engineering, manufacturing, shop testing, inspection, packing, delivery to site of 11 kV , 1250A, 31.5KA ,LSC2B , PM,IAC AFLR, Indoor, 24 panel switchboard for Central substation, conforming to the attached specifications/ documents. Supply of spares as per Spares List CD-CSS-11Kv –SB-SL. Installation and Commissioning support as per Engineering Specification CD-CSS-11KV –SB-ES.
Payment Terms	**Supply:** Payment of 90% of supply value shall be made within 30 days from receipt of material at site. Balance 10% payment along with full taxes and duties shall be made upon submission of 10% PBG. **Supervision of Installation & Commissioning:** On a pro-rata basis as and when the services are completed, within 30 days from providing the invoice and time sheet duly certified by FACT site Engineer.
Delivery Period	Within 24 weeks from the date of receipt of approved drawings / documents
Bid Evaluation Basis	Techno Commercially Qualified L1
EMD	INR 1,00,000/-(Indian Rupees one lakh only)

Detailed specifications and other terms and conditions are mentioned in the Tender Documents.

NOTE: -

1. The Tender Documents can be downloaded from FACT website (www.fact.co.in) or from GeM Portal (http://gem.gov.in).

2. Payment against EMD shall be remitted through NEFT/ RTGS to the FACT's account. Other mode of payment will not be accepted. The details of the remittance of amount such as UTR No. as applicable shall be uploaded along with the tender document. Original EMD (UTR document etc) shall be sent/submitted before the due date and time of OPENING OF THE TECHNICAL BID to the office of Assistant General Manager (Materials)-SP & PF/FACT-PD, Udyogamandal.

3. Offers against this NIT shall be submitted online on GeM portal https://gem.gov.in. Offers submitted on any other platform or in any other mode or including e-mails, physical offers etc. shall not be accepted.

4. FACT reserves the right to accept /reject any request for extension of the due date of tender.

5. FACT reserves the right to accept/reject any or all bids at any stage without assigning any reason thereof.

6. Submission of BIDS: Part- I & Part- II Bids are to be submitted online in 2 separate covers as mentioned in GeM Portal.

7. Offers submitted other than on-line mode shall not be accepted.

8. Time extensions, Corrigendums, etc if any, will be hosted in the GeM website only. The bidders are requested to visit the website regularly for Corrigendums, time extensions etc. if any.

9. Integrity Pact: The bidders shall sign and submit an " Integrity Pact (IP)" to be executed between the bidder and Fertilisers and Chemicals Travancore Ltd. along with the bid. IP shall be implemented through the following Independent External Monitor (IEM) for the bid.

    1. Shri. Ahmad javed
       Flat 902, Saikrupa Hill View,
       Golf Course Road, Sector-12.Kharghar, Navi Mumbai-410210
       Mobile: 9821058152 Mail: ajtopcop@gmail.com

    2. Shri. B Ravichandran
       Flat No.TF3, RKC Subrabath,
       7 th Street, Kumaran Colony,
       Vadapalani, Chennai 600 026
       Mobile: 9482234346 Email: bravi1958@gmail.com

    Note: In case bidders require any clarification pertaining to the tender please contact rishab@factltd.com / binduja@factltd.com. Kindly note that the Independent External Monitor should NOT be contacted for clarifications regarding the tenders.

    The Original Integrity Pact signed by the bidder is to be submitted (can be also in plain paper) on or before the due date of the tender by Post / Courier to The Assistant General Manager(Materials) ESS, Materials Department, PD Administrative Building, FACT Ltd., Udyogamandal P.O, Ernakulam -683501

    Scanned Copy of the Integrity Pact document duly filled and signed by the authorised representative of the bidder shall be submitted along with PARTA (PQC cum Techno-commercial) of the bid.

LIST OF ENCLOSURES :-

a) Technical Procurement Specification CD-CSS-11KV-SB R0
b) Eligibility Criteria
c) Compliance Statement
d) Integrity Pact- Proforma
e) Performance Bank Guarantee- Proforma

TECHNICAL PROCUREMENT SPECIFICATION	CD-CSS-11KV-SB	
	PAGE 1 OF 1	R0

TPS No.	CD-CSS-11KV-SB
STATUS	■ ENQUIRY ☐ COMMITMENT
ORIGINATING DEPT.	ELECTRICAL
P.O / W.O NO.	
PROJECT	SUPPLY OF 11KV, 1250A, 24 PANEL SWITCHBOARD FOR CENTRAL SUBSTATION
ITEM	11KV, 1250A, 24 PANEL SWITCH BOARD
LOCATION	CENTRAL SUBSTATION
CLIENT	M/S. FACT COCHIN DIVISION
PURCHASER	M/S. FACT COCHIN DIVISION
VENDOR	

REV NO.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
R1	28.09.2024	REV 1	JJM	SR	BKN
R0	29.08.2024	ORIGINAL ISSUE	JJM	SR	BKN

Sl. No.	Tag	Description	Page Number
1	CD-CSS-11KV-SB-IS	EQUIPMENT/ITEMS TO BE SUPPLIED	3
2	CD-CSS-11KV-SB-SW	SCOPE OF WORK	4
3	CD-CSS-11KV-SB-ES	ENGINEERING SPECIFICATION	5
4	CD-CSS-11KV-SB-DS	DATA SHEET	25
5	CD-CSS-SB-TPS-FD	FEEDER DETAILS	32
6	CD-CSS-11KV-SB-TP	TECHNICAL PARTICULARS	33
7	CD-CSS-11KV-SB-SIT	SCOPE OF INSPECTION AND TESTS	40
8	CD-CSS-11KV-SB-VDR	VENDOR DATA REQUIREMENTS	43
9	CD-CSS-11KV-SB-SL	SPARES LIST	44
10	CD-CSS-11KV-SB-SVL	SUB VENDOR LIST	45
11	CD-CSS-11KV-SB-CS	COMPLIANCE STATEMENT	46
12	CD-CSS-11KV-SB-PF	PRICE FORMAT	47
13	CD-CSS-11KV-SB-SLD	REFERENCE SLD	48

EQUIPMENT / ITEMS TO BE SUPPLIED	11kV, 1250A, 31.5kA, AIR-INSULATED SWITCHBOARD	CD-CSS-11KV-SB-IS	
		PAGE 1 OF 1	R0

Sl. No.	Description	Quantity	Remarks
1.0	Design, engineering, manufacturing, shop testing, inspection, packing, delivery to site of 11kV, 1250A, 31.5kA, LSC2B, PM, IAC AFLR, Indoor, 24 panel switchboard for Central substation, conforming to the attached specifications/documents.	1 NO	
2.0	Supply of spares as per Spares List CD-CSS-11KV-SB-SL.	1 SET	

SCOPE OF WORK	11kV, 1250A, 31.5kA, AIR-INSULATED SWITCHBOARD	CD-CSS-11KV-SB-SW	
		PAGE 1 OF 1	R0

The Scope of work includes the following			
Sl. No.	**Description**	**Required**	**Remarks**
1.0	Design, engineering, manufacturing, testing at works and supply of the following medium voltage switchboard fully conforming to the attached specifications and documents		
1.1	11kV, 1250A, 31.5kA, LSC2B, PM, IAC AFLR, Indoor, 24 panel switchboard for Central substation.	Yes	
2.0	Arranging inspection and tests as per Scope of Inspection & Tests CD-CSS-11KV-SB-SIT.	Yes	
3.0	Supply of spares as per Spares List CD-CSS-11KV-SB-SL.	Yes	
4.0	Installation and commissioning support as per Engineering Specification CD-CSS-11KV-SB-ES.	Yes	

1.0.0 SCOPE OF WORK

1.1.0 This specification covers design, engineering, manufacturing, shop testing, inspection, packing, delivery to site, installation supervision and commissioning support of 11kV, 1250A, 31.5kA, LSC2B, PM, IAC AFLR, Indoor Switchgear and control gear fully type tested according to IS/IEC 62271-200 standards for industrial applications designed to give reliable and continuous operation at the load rating specified in the data sheet/ single line diagram.

1.2.0 The equipment offered shall be complete with all parts necessary for their effective and trouble-free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in the commercial order or not.

1.3.0 The design of the switchgear should be exclusive and specific responsibility of supplier and should be comply with current good engineering practice, the relevant codes and recommendation, the project specific requirements.

2.0.0 STANDARDS

2.1.0 The switchgear shall be designed, manufactured, assembled and tested in accordance with the following standards:

Reference Standards	Description
IS/IEC: 62271	High voltage switchgear
IS: 13118/ IEC: 62271	Circuit Breakers
IS: 3231/ IEC: 60255	Electrical relays
IS: 2705/ IEC: 60044	Current transformer
IS: 3156/ IEC: 60044	Potential transformer
IS: 3043	Code of practice for earthing
IS: 3427/ IEC: 60529	Degree of protection

3.0.0 CONSTRUCTION

3.1.0 The switchgear and control gear panels shall be fully arc proof LSC 2B, PM, IAC AFLR for 31.5kA for 1sec, floor mounted and free standing type, internal arc tested for designed fault current, fitted with floor rolled truck mounted Vacuum circuit breaker in fully horizontal draw out execution and horizontal isolation type, consisting of separate panels assembled into one or more sections to form a single structure with a common bus bar assembly.

3.2.0 The panels shall be constructed from prime quality folded and riveted Aluminum Zinc coated steel sheet or pre-galvanized sheets or Powder Coated CRCA sheets of 2 mm thickness. All non-painted steel parts, if any, shall be zinc-plated or galvanized or powder coated.

3.3.0 Front access with hinged doors shall be available to all components in the cubicle which require adjustment, maintenance or replacement. All hinges shall be of concealed design for elegant appearance.

3.4.0 The functional unit outer enclosure shall have a degree of protection of IP4X.

3.5.0 Seal-off bushings should be provided wherever bus bars pass through metallic partitions.

3.6.0 Suitable arc propagation barriers shall be provided between the panels. Explosion vents of suitable design shall be provided on the roof sheet of the busbar/cable/CT's chambers so as to enable discharge of explosive gases from inside during a flashover. However the provision of explosion vent shall not affect the degree of protection/vermin proofing of the panel.

3.7.0 All barriers used shall be manufactured from non-inflammable material. All hardware shall be corrosion resistant. Doors & openings shall be provided with neoprene gaskets.

3.8.0 Access between the circuit breaker (or withdraw-able voltage transformer) and bus bar/ cable compartments shall be made through epoxy encapsulated spout bushings of uniform shape and dimension. Spouts are covered by automatic metal shutters, covering all three phases unless the circuit breaker is in service position.

3.9.0 An arrangement in which the panel door is integral with the circuit breaker truck is not acceptable.

3.10.0 The switchgear front cubicle shall be provided with a position changing gear arrangement in such a way that by engaging detachable device from outside the front door, it shall be possible to move the breaker truck and change position without opening the cubicle door.

3.11.0 Proper guide rails for easy insertion and withdrawal of the circuit breaker shall be provided. Different positions of the CB like service, test and isolated positions shall be clearly marked. Adequate barriers shall permit personnel to work safely within an empty breaker compartment, with the bus bars energized.

3.12.0 Shutters shall automatically screen cable and bus bar isolating connections before the CB reaches isolation position.

3.13.0 Cable head compartment of the CB shall be so designed to receive, in addition to cable incoming/ outgoings, wound or bar primary current transformers etc.

3.14.0 Cable head compartment of the panel board so designed to receive wound or bar primary current transformers and surge arrestors in addition to cable incoming/ outgoings.

3.15.0 Rear bottom plates of the cable compartment shall be fitted with removable gland plates of adequate size for fixing the cable glands.

3.16.0 The cable compartment shall be provided at the rear of the switchgear panels suitable for bottom entry of the cable and shall have sufficient space and support arrangement inside each panel to accommodate HT cable termination kits and sealing kits suitable for cable size mentioned in the feeder details.

3.17.0 Cable compartment shall be robust enough & self-supporting. The design shall be such that the weight of the power cable within the compartment shall not cause direct pressure on the CT studs.

3.18.0 The bus bar system shall be air insulated and housed in a separate compartment and shall be accessible for inspection only with special tools. In the bus bar compartment of the CB, the triple pole bus bars shall be arranged on supports like epoxy resin, to provide long air insulation distance and creepage path.

3.19.0 The bus bar compartment shall be provided with bolted covers. Necessary extra precaution like additional covers, caution signs etc. shall be provided to prevent inadvertent contact with live busbars.

3.20.0 Low voltage compartment shall be fitted with all protection relays, auxiliary relays, instruments etc. It shall be mounted on top side of the front compartment receiving the movable section of the CB.

3.21.0 All relays and meters mounted on low voltage compartment shall be flush type and different items shall be logically laid out on the front of this compartment. Relays/control switches/push buttons which require adjustment, resetting, operations shall be mounted at reasonable operating height from the floor level. Max. operating height shall be 1900 mm and min. 400 mm from the floor level.

3.22.0 Switchboard comprising of a number of CB panels, shall be of unit construction to enable the board to be broken down into sections for shipping to site and to be correctly reassembled and erected on prepared foundations without skilled supervision. Inter-panel and inter-compartmental wiring shall preferably be protected by heavy gauge solid metal conduit or trunking.

3.23.0 The construction of switchboard shall be reliable, safe, self-contained, compact, interchangeable, accessible, easily extensible at both ends and complete with all positive mechanical interlocks.

3.24.0 Adequate lifting facilities shall be provided on each section. Lifting eyes may be of removable/foldable design. When removed, these shall not leave any openings on the boards.

3.25.0 Bolt, nut, plain washers, spring washers suitable for cable termination as per the attached feeder details shall be supplied by the vendor.

3.26.0 Indoor type, metal oxide surge arresters suitable for capacitor feeders shall be connected to outgoing capacitor bank feeders if vacuum circuit breakers are supplied. Surge arresters shall have nominal discharge current In-10kA and IEC class station medium(SM) or higher. The surge arrester shall be designed and constructed in accordance with IEC 60099-4 and the requirements of this specification. The metal-oxide used shall be of high quality to ensure thermal stability under service duty of the surge arrester. The arrester shall be single column; self-supported and be installed between phase and earth of all three phases. The housing of the surge arrester shall be made of high quality silicone. Continuous operating voltage of the surge arrester shall be highest system voltage specified and rated voltage shall be 1.25 times continuous voltage.

4.0.0 CIRCUIT BREAKER

4.1.0 The circuit breaker shall be of suitable type and rating as mentioned in the data sheet and suitable for indoor use. The CB shall be of three pole, horizontal drawout, horizontal isolation, low surge, roll on the floor type. The breaking medium of circuit breaker contact shall be vacuum.

4.2.0 Rated operating duty shall normally be O-0.3sec -CO-3 min –CO.

4.3.0 Total break time shall be less than 75ms.

4.4.0 The circuit breaker shall be designed so as to have class E2 (circuit breaker with extended electrical endurance), class M2 (circuit breaker with extended mechanical endurance, mechanically type tested for 10,000 cycles)and class C2 (very low probability of restrike), as defined by IEC 62271-100.The offered circuit breaker should have valid type tests to support mentioned duty class.

4.5.0 The breaker isolating contacts shall be of self-aligning type and shall have ample area and contact pressure for carrying the rated current and short circuit currents such that there is no excessive temperature liable to bring about pitting or welding and it shall not show tendency to "blow off" when carrying rated short circuit currents.

4.6.0 The operating mechanism of the CB shall be quick make, quick break type and trip-free as per relevant code of protection.

4.7.0 Circuit breaker shall be provided with electrically operated motor charged spring closing mechanism.

4.8.0 In motor charged spring closing mechanism, the charging of the closing spring shall be automatically initiated after every closing operation. It shall be ensured that the closing operation shall be possible only when the springs are fully charged. Suitable protection circuit, limit switches, etc. shall be provided for protection of the spring charging motor and to cut out the motor when the springs are fully charged.

4.9.0 The closing solenoids / coils and auxiliary devices shall operate satisfactorily between 85 and 110% of the rated auxiliary supply voltage indicated in the data sheet. Trip coils shall operate satisfactorily at all voltages between 70% and 110% of the rated auxiliary voltage.

4.10.0 Irrespective of the mode of operation of the breaker, independent manual closing and tripping arrangements shall also be provided as a standard feature for emergency and testing purposed. Necessary operating handles shall also be supplied.

4.11.0 Mechanical interlock shall be provided for preventing any inadvertent / undesired operation. For instance, closing the breaker when the springs are being charged, draw out of breaker while breaker is in closed and service position etc.

4.12.0 Breakers of same rating shall be interchangeable. Wiring and termination of plug in contacts shall be identical in all interchangeable breakers.

4.13.0 Non-reset type operation counter shall be provided.

4.14.0 Vacuum interrupters of the circuit breakers shall not be openly exposed design and shall be completely encapsulated in epoxy housing.

4.15.0 A minimum of 3 sets (NO&NC) of auxiliary contacts each are to be provided on breaker operating mechanism as spare, exclusively for the use of purchaser. Auxiliary contacts shall have continuous rating of 10A at 240V. Multiplication shall be done only mechanically. All auxiliary contacts shall be wired to the terminal block. Auxiliary contacts and limit switches shall be in dust tight enclosures.

4.16.0 Anti pumping relay & circuitry / anti pumping feature shall be provided in the closing circuit of the CB to ensure that it does not reclose automatically after a tripping or in the case of failure to close, even if the closing impulse is maintained.

4.17.0 The control circuit shall be suitable for local as well as remote control. Each control circuit tapping shall be provided with MCB.

4.18.0 The control and other auxiliary connections from the CB to the cubicle shall be through plugs and sockets, rated for 10A (minimum) / 650 V, located at either ends and connected through flexible jumpers. The jumper shall have sufficient number of spare cores to utilize all the spare auxiliary contacts and it shall be long enough to maintain connection in the test position of the truck. The multi pin plug provided shall have scraping earth terminal.

4.19.0 The jumper shall have sufficient number of spare cores to utilize all the spare auxiliary contacts and it shall be long enough to maintain connection in the test position of the truck. The multi-pin plug provided shall have scraping earth terminals.

4.20.0 All circuit breakers shall have Service/Test position indicators. These shall be visible from the front without opening the panel door.

4.21.0 All circuit breakers shall have mechanical ON/OFF indicator and spring charge indicator. These shall be visible from the front without opening the panel door. There shall be provision for mechanical (manual) tripping of breaker and manual charging of the springs.

4.22.0 It shall not be possible to close the circuit breaker unless it is fully "plugged in" (truck in service position) or fully isolated (truck in the test position) or has been completely removed from the cubicle.

4.23.0 Interlock shall be provided to prevent pushing in/ drawing out of the breaker truck when the breaker is in the closed position.

4.24.0 Truck cannot be racked into service position with door open and control connection disengaged. Insertion of breaker into `Service' position shall not be possible if safety shutters are not free. Door interlock shall have defeat feature.

4.25.0 The above positive mechanical interlocks are the minimum requirements. Manufacturers can include any other safety interlocks which maybe necessitated by the particular design feature of the CB.

4.26.0 Padlocking facility in test & service position to be made available.

4.27.0 Safety shutters shall be spring loaded, positively operated by the travel of the draw out truck.

4.28.0 Since vacuum circuit breakers are used suitable surge suppressors need to be installed on all outgoing feeders and spare.

5.0.0 BUS BARS

5.1.0 Busbar shall conform to relevant Indian / International standards. All phase bus bars shall be of uniform cross-section through out the switchboard.

5.2.0 Bus bars shall be of high conductivity aluminium/ copper as specified in the data sheet. Busbars shall be continuously rated for the rated current and service conditions specified. Busbars shall be provided with heat shrinkable PVC insulated sleeves and busbar joints shall be shrouded.

5.3.0 Maximum allowable current density for bus bars shall be 1.25A/mm2 for copper conductor and 0.78A/mm2 for aluminium conductor.

5.4.0 The horizontal and vertical bus bars shall be rated for the same fault level specified in the data sheet.

5.5.0 The bus bars and bus supports shall withstand the dynamic, thermal and magnetic stresses and strains due to the maximum short circuit current corresponding to the fault level indicated in the data sheet, without any deformation, deterioration or damage.

5.6.0 Suitable provisions shall be made for the expansion and contraction of the bus caused by temperature variation and due consideration shall be given for reactance, proximity and skin effects also, while choosing the sizes and spacing of bus bars.

5.7.0 It shall be possible to extend the busbars on either side without any further fabrication/modification on the existing busbars. Removable end covers with fixed nut & bolting arrangement shall be provided on either end and the ends of the bus bars shall be suitably drilled.

5.8.0 Appropriate identification marking / labels shall be provided on the busbars and tapings for distinguishing the various phases.

6.0.0 INSTRUMENT TRANSFORMERS

6.1.0 <u>CURRENT TRANSFORMER</u>

6.1.1 CTs shall conform to relevant Indian / International standards and shall be cast resin insulated. They shall be mounted on switchgear stationary part.

6.1.2 CTs shall withstand the maximum short circuit current for a minimum of one second and it shall be designed to withstand stresses resulting from the maximum short circuit currents. CTs for metering and protection shall be selected suitably to meet the individual requirements of meters and relays specified in the data sheet. Low reactance CTs shall be used for protection.

6.1.3 CTs for metering purposes shall have adequate capacity to cater for 130% of full load conditions. Instrument security factor for metering CTs shall not be more than 5 and shall have an accuracy class of 1, unless otherwise specified.

6.1.4 CTs for protection purposes shall have sufficient accuracy, burden and accuracy limit factor for necessary co-ordination/discrimination for clearing the faults. Accuracy limit factor for protection shall not be less than 10 and accuracy class shall be 5P.

6.1.5 The minimum burden of the CTs shall be 10 VA. However, the actual burden of the CTs shall meet the requirements of relays, instruments and leads associated with the particular CT including 20% spare capacity.

6.1.6 CTs for differential protection shall have an accuracy class of PS.

6.1.7 Separate CTs/cores shall be used for metering and protection. Dual purpose CTs are not acceptable.

6.1.8 CTs shall be provided with polarity markings, adjacent to terminals, both for primary and secondary. These shall be legible even after years of service.

6.1.9 CTs shall be of class E insulation unless otherwise specified.

6.1.10 Unused CT terminals must be short circuited.

6.1.11 CTs shall have solidly earthed system.

6.1.12 The CT terminals which have been used shall be provided with links to facilitate shorting as and when required (when load / burden on CT is disconnected).

6.1.13 All live terminals shall be shrouded to prevent accidental contact.

6.2.0 VOLTAGE TRANSFORMER

6.2.1 VTs shall conform to relevant Indian / International standards and shall be cast resin insulated.

6.2.2 VTs shall have suitable accuracy and capacity for the satisfactory operation of the protection, instrumentation and metering specified in the data sheet / drawings enclosed. The class of accuracy and the burden of VTs selected shall be adequate for the destined different purposes.

6.2.3 Voltage transformer shall be of fully draw out type and shall be provided with HRC fuses on both HV & LV sides. The draw out mechanism shall disconnect the bus bars and shall earth the VT primary and secondary terminals. The primary connection shall be disconnected before the VT or its primary fuses become accessible.

6.2.4 Withdrawable type, line potential transformer shall be mounted on top of cable chamber or with the incomer breaker. PT mounted inside cable chamber is not acceptable.

6.2.5 The primary rated voltage shall be equal to the rated voltage of the system and unless otherwise specified, secondary voltage shall be110V.

6.2.6 PTs shall have solidly earthed system.

6.2.7 PT shall be of class E insulation unless otherwise specified.

7.0.0 PT SUPPLY SELECTION SCHEME

7.1.0 PT selection scheme shall be provided in the bus coupler panel. PT voltage supply to the bus sections shall be fed from the respective incomer's PT secondary in normal conditions.

7.2.0 When entire panel is charged using only one incomer through bus coupler, PT supply to the entire panel shall be from PT secondary of incomer in charged condition. Bus-coupler breaker 'NO' contacts shall be used in the control circuit of PT supply changeover scheme.

7.3.0 It shall be possible to parallel the incomer-1 PT secondary and incomer-2 PT secondary when both incomers are in parallel condition.

8.0.0 RELAYS

8.1.0 Relays shall conform to relevant Indian / International standards.

8.2.0 All protective relays shall be Numerical type. Conformal coating shall be applied on all Printed Circuit Boards for industrial application.

8.3.0 Numerical protection relays shall be suitable for auxiliary (control) power supply of 110V DC with 70-110% variation.

8.4.0 Protection relays shall be suitable for the CT/ VT secondary currents/voltages and other auxiliary relays shall be rated for the auxiliary voltage available. The IDMT characteristic of the relay shall be in complying with IEC curves.

8.5.0 It shall be ensured, by checking with the relay manufacturer, that with the accuracy limit factor indicate/ chosen, the thermal withstand capability of the relays will not be exceeded for the fault levels specified.

8.6.0 Relays shall be flush mounted and of a type and make approved by the buyer. List of acceptable makes is indicated in the data sheet.

8.7.0 Numerical relay shall have control, measurement and supervision.

8.8.0 Relays shall have self-monitoring facility and it shall have relay healthy/relay in operation indication on fascia.

8.9.0 There shall be provision for latched trip to restrict accidental closing of CB after a trip.

8.10.0 Relay shall have suitable minimum 2 lines LCD display with backlight and sufficient number of input so that all electrical control interlocks can be fulfilled by numerical relay. Relay shall have the provision for custom alarm message based on logics created using Programmable relay inputs.

8.11.0 Protection relays shall be back connected, suitable for flush mounting and fitted with dust tight covers.

8.12.0 Non-protective relays can be in fixed execution.

8.13.0 All Protective relays shall connected and programmed by PC with windows10 or higher with USB cable (vendor needs to supply 2 number of USB cable for this purpose). They shall follow IEC standard tripping curves.

8.14.0 The relay shall be communicable on standard Modbus protocol with at least one communication port for SCADA connection. The relay should offer multi-level password protection to guard against unauthorized access.

8.15.0 Relay output shall be programmable with basic logical operation and provision for using any input to derive output and there shall be provision for inverting input/output.

8.16.0 Relay shall have provision for recording at least 25 numbers of input & alarm events with time stamp and 25 number of fault details with time stamp. All the external inputs from field taken as input to numerical relay shall be through suitable interfacing relay.

8.17.0 Numerical relays shall have suitable navigation and operation keys to set/edit all parameters without using computer.

8.17.0 FEEDER PROTECTION RELAY

8.17.1 Incomers and all feeders shall have dedicated numerical feeder protection and control relay designed for the protection, control, measurement and supervision of utility substations and industrial power systems.

8.17.2 The protective relay shall be multifunction type with protection features such as Phase overcurrents, Ground overcurrents, Directional phase overcurrents, Directional Ground overcurrents, Negative sequence overcurrents, Thermal overload, Phase discontinuity, Phase overvoltages, Phase undervoltages, Circuit breaker failure, Trip circuit supervision, Self monitoring/relay healthy, Disturbance record, Fault record, Event record, Three-phase current and voltage measurement, Harmonic analysis and THD measurement.

8.17.3 Numerical relay shall have serial, USB ports and multiple protocols for SCADA connectivity.

8.17.4 The relay shall have provision for logical programming using the digital inputs and output shall be generated for controlling circuit breakers, annunciators, indication lamps etc.

8.17.5 Relay shall have minimum 16 Digital inputs, 9 Digital outputs (including relay watchdog) and 8 programmable LED indications. Proposed list of Digital inputs and outputs as follows. Modification shall be applicable at the time of detailed engineering.

Digital Inputs	Digital Outputs
1) Trip circuit healthy (Breaker in OFF condition)	1) Breaker ready to close
2) Trip circuit healthy (Breaker in ON condition)	2) Breaker close command
3) Breaker status	3) Trip command to master trip
4) Breaker spring charged	4) Trip command to Down stream
5) Breaker in service	5) Breaker Trip circuit healthy
6) Breaker in test	6) Trip indication
7) Lock out operated	7) Trip alarm to annunciator
8) Differential relay healthy	8) Relay healthy watchdog
9) TNC close	9) Spare
10) Transformer winding temperature alarm	
11) Transformer winding temperature trip	
12) Transformer oil temperature alarm	
13) Transformer oil temperature trip	
14) Transformer buchholz alarm	
15) Transformer buchholz trip	
16) Spare	

8.18.0 DIFFERENTIAL PROTECTION RELAY

8.18.1 7 MVA transformer feeders shall have dedicated numerical transformer protection and control relay designed for the protection, control, measurement and supervision of 2 winding, Delta/Star (DY11), neutral solidly earthed transformers.

8.18.2 The protective relay shall be multifunction type with protection features such as Differential protection (87T), Phase overcurrents, Ground overcurrents, Self monitoring/relay healthy, Disturbance record, Fault record, Event record, Three-phase current and voltage measurement.

8.18.3 Relay shall have minimum 10 digital inputs and 10 digital outputs (including relay watchdog) and 8 programmable LED indications. Proposed list of Digital inputs and outputs as follows. Modification shall be applicable at the time of detailed engineering.

Digital Inputs	Digital Outputs
1) Transformer winding temperature alarm	1) Relay healthy watchdog
2) Transformer winding temperature trip	2) Trip command to master trip
3) Transformer oil temperature alarm	3) Trip command to Down stream
4) Transformer oil temperature trip	4) Trip indication
5) Transformer buchholz alarm	5) Trip alarm to annunciator
6) Transformer buchholz trip	6) Non Trip alarm to annunciator
7) Spare	7) Spare
8) Spare	8) Spare
9) Spare	9) Spare
10) Spare	10) Spare

8.19.0 CHECK SYNCHRONIZING RELAY

8.19.1 Check synchronizing relay shall be connected in bus coupler panel.

8.19.2 The synchro-check relay shall allow circuit breaker closing only if the voltages on both sides of the circuit breaker fulfill the preset conditions as to magnitude, phase and frequency difference when two energized networks are to be connected together.

8.19.3 It shall have voltage check function to close bus coupler when an energized network section is to be connected with a non-energized network section.

8.20.0 MASTER TRIP RELAY

8.20.1 All feeders shall have 2 element, voltage operated, high speed trip relay.

8.20.2 Master trip relay shall have minimum 6 number of NO contact and 2 number of NC contact.

9.0.0 AUXILIARY RELAYS

9.1.0 Auxiliary relay for Down stream breaker status, Primary to Secondary inter-trip, Secondary to Primary inter-trip, winding temperature alarm, winding temperature trip, oil temperature alarm, oil temperature trip, buchholz alarm, buchholz trip, DC failure etc. shall be connected in all panel sections as required.

9.2.0 Potential free contacts of auxiliary relays shall be wired to the protection relay and alarm scheme.

9.3.0 All auxiliary relays shall have minimum 1NO+1 NC potential free contacts as spare.

10.0.0 INDICATING INSTRUMENTS

10.1.0 Meters shall be flush mounted and of a type and make approved by the buyer.

10.2.0 Meters shall be of reputed make and shall conform to relevant Indian Standards.

10.3.0 Voltmeter shall be moving iron type complete with suitable selector switch and control fuses and it shall be of class 1 accuracy as per IS:1248. Voltmeter shall have initial suppressed scale for the lower values in the range.

10.4.0 Ammeter shall be of moving iron type complete with selector switch. Ammeters for motor feeders shall have uniform scale up to rated full load current and suppressed scale at the end to indicate the motor starting current. A red mark shall be provided on the ammeter dial to indicate rated full load. Calibration of the ammeter shall tally with the ratio of the CT. Ammeters shall be of Class 1.5 accuracy as per IS:1248 unless other-wise specified.

10.5.0 Cushion stoppers and zero correction screws shall be provided for all meters. Meters shall have knife edge pointer and preferably with anti-parallax mirror.

10.6.0 All meters shall be square type of size 96 mm x 96 mm. unless otherwise specified. Dials shall be white with black numerals and letters.

10.7.0 All control / selector switches used shall be of rotary type, spring loaded and of robust construction. The operating handle of these switches shall be knob type and of black colour. The switches shall have 3 way with OFF position. Necessary facia plates shall be black anodized aluminium with white lettering.

10.8.0 All auxiliary equipment such as shunts, transducer, etc., as required, shall be included in the supply of switchboard.

10.9.0 All meters shall be magnetically screened and temperature compensated.

11.0.0 MULTI FUNCTION METER

11.1.0 Meters shall be of reputed make and shall conform to relevant Indian standards.

11.2.0 MFM meters shall be configurable & programmable through the front panel.

11.3.0 Microprocessor based Electronic Multi Function Meter (MFM) with load survey facility and RS 485 communication port with necessary software / hardware for connectivity to PLC/DCS/SCADA through the use of Modbus RTU communications (Parameters A, V, KW, KWH, KVA, KVAR, PF, %THD of voltage & current) shall be supplied as specified in data sheet.

11.4.0 The front panel shall have 3 rows of 4 digits / characters each LED display. MFM meters shall have Three-Phase Electrical Instrumentation and load management facilities in a compact and rugged construction. The displayed readings shall be updated in every second.

11.5.0 Meter shall be configurable for 5 A or 1 A secondary CTs.

11.6.0 The meter shall have accuracy class 1.

11.7.0 Multi-function meter shall be operated through CTs and VTs only. The rating shall correspond to full load requirements. Multi- function meter shall be compatible for SCADA connectivity.

11.8.0 All meters shall be square type of size 96 mm x96 mm. unless otherwise specified.

12.0.0 ANTICONDENSATION HEATER

12.1.0 Space heaters shall be provided in the Circuit Breaker panel and cable chamber. It shall be of adequate capacity and rated for the auxiliary supply specified in the data sheet. Necessary MCB and thermostat shall be provided for the heater.

12.2.0 Heater shall be provided inside the panel in easily accessible position for removal / replacement.

12.3.0 Wiring of space heater shall be isolated or separately bundled from other internal wiring.

13.0.0 ANNUNCIATION SCHEMES

13.1.0 TRIP ALARM

13.1.1 24 window annunciator for Auto trip (86 trip) and trip circuit unhealthy shall be fixed in Bus coupler/Bus riser panel. Hooter and Annunciator shall be rated for 85-230V AC/DC.

13.2.0 DC FAILURE ALARM

13.2.1 24 window annunciator for DC failure shall be fixed in Bus coupler/Bus riser panel. Hooter and Annunciator shall be rated for 85-230V AC/DC.

13.3.0 TRIP AND NON TRIP ALARM FOR TRANSFORMER FEEDERS

13.3.1 10window annunciator shall be mounted in all transformer feeders. Hooter and Annunciator shall be rated for 85-230V AC/DC. Common hooter shall be provided at Bus coupler/Bus riser panel.

13.3.2 Window display required for the annunciator is as follows.

Trip and Non-Trip Alarms in Transformer Feeders
1) Transformer winding temperature high alarm
2) Transformer winding temperature trip
3) Transformer oil temperature high alarm
4) Transformer oil temperature trip
5) Transformer buchholz alarm
6) Transformer buchholz trip
7) REF acted
8) LV breaker OFF
9) Spare
10) Spare

13.4.0 GENERAL

13.4.1 Annunciators shall have Acknowledge, Test, Reset push buttons.

13.4.2 In the event of a fault/alarm, respective window in the annunciator alarm fascia shall start and the hooter start sounding. When the alarms accept PB is pressed the hooter shall stop and the fascia window shall glow steady. After resetting the flags and contacts on the protective relay/auxiliary relay which initiated the alarm, the alarm scheme can be reset by pressing the reset PB. While pressing reset push button, the window which was glowing steady till then shall go off.

13.4.3 The annunciation scheme shall be repetitive and shall be ready to receive and initiate systematically a second or third fault, irrespective of whether the alarm due to first or second fault in other panels is in 'initiated' or 'accepted' or 'relay reset' condition prior to fully resetting of the annunciation scheme.

13.4.4 It shall be possible to check the healthiness of fascia windows by pressing the test PB.

14.0.0 PUSH BUTTON

14.1.0 Colour of push button knobs shall be as per relevant Indian Standard.

14.2.0 All push buttons shall be provided with legend plates to identify the function or operation.

14.3.0 All push buttons shall have minimum 1 NO + 1 NC contacts, unless otherwise specified in the data sheet. Push button shall have contacts rating of 10A.

15.0.0 CABLE TERMINATION

15.1.0 Identification / numbering / lettering shall be provided for each terminal.

15.2.0 Not more than one incoming / outgoing cable is to be connected per terminal.

15.3.0 Minimum 20% spare terminals shall be provided on each terminal block.

15.4.0 Shorting links shall be provided for all CT terminals.

15.5.0 Conductors shall be terminated with adequately sized tinned copper lugs for connection to equipment terminals and strips. Stranded conductors shall be soldered at the ends before connections are made to the terminals.

15.6.0 Terminal strips shall be preferably separated from power circuits by metal barriers or enclosures.

15.7.0 Terminal strip for outgoing control cable connections shall be accessible to facilitate working and testing with breaker in test / service condition and while the switchboard is energized.

15.8.0 Control terminals for external termination shall be located in the relay compartment only. All terminals going out of the switchboard shall be brought to a separate terminal board marked "External Termination". These will be easily accessible.

16.0.0 WIRING

16.1.0 Control and power wiring shall be kept separate.

16.2.0 All wiring for controls shall in general be carried out with copper conductor of size not less than 2.5 sq.mm.

16.3.0 The wiring shall be of suitable grade and shall have flame resisting insulation. The insulation grade shall be 1100V / 650V min.

16.4.0 Wiring shall be terminated in easily accessible terminal blocks.

16.5.0 The wires shall be arranged neatly and the two ends of each wire and the terminal blocks shall bear the circuit number by using printed ferrules for identification purposes.

16.6.0 Control wiring wherever terminated shall be in single layer formation.

16.7.0 All inter panel control wiring shall be taken through PVC sleeves and this shall be done by the switchgear manufacturer with identification of wires and terminals for interconnection.

16.8.0 Whenever a VT is mounted on the breaker carriage, all auxiliary wiring shall be done in conduits.

16.9.0 All spare contacts of protection relays, aux. relays, aux. contactors, timers, etc. shall be wired up to the terminal block.

16.10.0 Provisions shall be made in the switchgear cubicles for testing and calibrating the relay by current injection using external source, without disconnecting the permanent wiring.

17.0.0 INSULATION

17.1.0 The insulation between phases and between phases & ground for power or control conductors shall be made of suitable insulating material resistant to heat, dust and dampness. It shall be non-hygroscopic, mould proof and treated with suitable varnishes.

17.2.0 Minimum clearance between phases, or between connections of same phases separated electrically from each other, or between phases and ground, shall be as per relevant standards.

18.0.0 EARTHING

18.1.0 Earthing arrangement shall be in accordance with relevant Indian Standards.

18.2.0 Continuous earthing strips shall be provided for the complete length of the switch board. Strips shall be connected to the body of the switchboard by means of integral bolts, spring washers and nuts.

18.3.0 Earthing terminals shall be provided on the trucks to earth the body of the truck when pushed into the cubicle.

18.4.0 A minimum of 2 terminals shall be provided on the strip for external connections to earth grid.

18.5.0 All doors and movable parts shall be connected to earth bus with flexible copper connection.

18.6.0 All non-current carrying metallic parts of the equipment shall be earthed.

18.7.0 Earth bus shall be extended up to each cable compartment and earthing bolts shall be provided to ground cable armours.

19.0.0 PAINTING AND LABELLING

19.1.0 The sheet steel housing and all the metal surfaces shall be properly painted as per relevant Indian standards suitable for corrosive environment. Non-painted steel parts shall be zinc-plated or galvanized.

19.2.0 All panels shall have, on the front and the rear sides, nameplates in large sized letters, giving feeder details.

19.3.0 Painted SLD shall be provided on all the panels of the switchboard.

19.4.0 All parts shall be painted with minimum thickness of 90 microns.

19.5.0 Nameplates shall be fastened by "screws" and not by adhesives.

19.6.0 Name plates shall be provided for all equipments such as lamps, PBs, switches, relays, aux. contactors etc. mounted on the switchboard, indicating the operation / function.

19.7.0 Special warning plates shall be provided on all removable covers or doors giving access to high voltage cables/ bus bars and inside the switchboard also wherever considered necessary.

19.8.0 Nameplates shall be of white Perspex acrylic sheet with letters engraved in black.

19.9.0 A nameplate with the switchgear designation shall be fixed at the top of the central panel.

19.10.0 Bus side and cable side shutters shall be labeled for identification.

19.11.0 Nameplates shall be provided for all Door/front mounted devices such as lamps, PBs, switches, relays, aux. contactors etc., directly below them, giving the nomenclature and purpose of the device.

19.12.0 Labels shall be made of non-rusting metal with engraved inscriptions of white letters on black background.

19.13.0 The size of the letters giving switchboards designation shall be 25 mm that for feeder details 20mm and for components 6mm, unless otherwise specified in the data sheet. Label designation and size of lettering subject to approval.

20.0.0 FOUNDATION BOLTS

20.1.0 Necessary foundation channels (if not integral), bolts and nuts shall be supplied along with the equipment.

21.0.0 EARTHING TRUCK

21.1.0 One number of Line Earth Truck shall be supplied for each size of panel section. One number of Bus Earth Truck suitable for incomer section shall be supplied. The Earthing truck shall be fully draw out type, complete with necessary earthing links to facilitate earthing on the cable side and bus side. Locking facility shall be available. Earthing links shall be of size to withstand the fault current specified in the single line diagram/data sheet.

21.2.0 The earthling switch shall have full making capacity in accordance with IS/IEC standard 62271.

22.0.0 MODBUS GATEWAY

22.1.0 Two number of Schneider Electric make EcoStruxure Panel Server 'PAS600' with charging unit, MCB's and necessary connectors for fetching the data from all multifunction meters and relays to existing Energy Management Systems shall be mounted in panel no.24.

22.2.0 Separate Serial communication cable wiring to MFM and protection relays shall be provided for connecting to PAS600. Provision for connecting external communication cables shall be given in panel no.24.

23.0.0 SPARE & SPECIAL TOOLS

23.1.0 Spare parts (as per spare part list) and special tools for operation recommended for keeping in stock for trouble free operation of switchboard for a minimum period of 2 years shall be supplied. List and catalogue numbers of these spare parts shall also be furnished. Vendor shall supply handle for manual spring charging, PT inserting handle, operation and maintenance manual, panel lifting fixtures, sealant, sealant gun, touch up spray (3 bottle) with the switchboard.

23.2.0 Vendor shall supply 2 numbers of breaker Racking In/Racking Out handle and 5 number of Trip/Close rods.

23.3.0 Vendor shall supply 2 number of breaker inserting plate (ramp assembly) of each size of panel board.

24.0.0 INSTALLATION SUPERVISION AND COMMISSIONING ASSISTANCE

24.1.0 The new switchboard is intended for replacing the existing switch board in central substation. The replacement of existing switchboard and erection of new one will be carried out using another contract. The installation of new switchboard will be done in two phases. Panel number 1 to 13 specified in feeder details will be installed in first phase. Installation of rest of the panels will start only after commissioning the first phase panels. Panel number 14 to 24 will be installed in second phase. Vendor shall arrange OEM authorized skilled persons to supervise and assist in commissioning activities for 3 days in both phases (Total 6 days).

24.2.0 Commissioning assistance shall include inspecting the switchboard foundation/bus bar connections/panel inter-linking/cable connections, Checking Breaker ON/OFF operations, breaker Racking In/Out operations, PT Racking In/Out operations, minor modifications in control wiring (if required), Relay settings etc. for successful completion of the work.

1.0	11kV, 1250A, 31.5kA, AIR-INSULATED SWITCHBOARD	
1.1	Service conditions	
	a) Altitude	< 1000m above mean sea level
	b) Humidity	Min 64%
	c) Humidity	Max. 93%
	d) Humidity design	100% at 400C
	e) Ambient temperature 0 C-Min.	19.2
	f) Ambient temperature 0 C-Max.	35
	g) Ambient temperature 0 C-Design	50
	h) Rain fall – Max . Record in an hour	40mm
	i) Rain –fall Max record in 24 Hours	169.5mm
	j) Environment	Highly corrosive industrial area, Presence of SO2 and other corrosive gases and chemical dusts, which can form conductive tracks.
	k) Wind velocity for structural design	124 km/h
	l) Seismic factor for design	Within seismic Zone 3 as per IS 1893
1.2	Rating details	
	a) Voltage	11kV +/- 10%
	b) No. of phases/wires	3 phase, 3 wire
	c) Frequency	50 Hz +/-5%
	d) Neutral earthing	Solid
	e) Continuous rated current	1250A
	g) Short time current, KA/sec	
	Power bus	31.5 KA/1sec
	Ground bus	31.5 KA for 3 sec
	CT	31.5 KA/1sec
	h) Electrically exposed / Non exposed	Non exposed
1.3	Control supply	
	a) DC auxiliary supply voltage (For shunt trip coil, closing coil, indication lamps, Trip and Non-Trip alarm annunciators etc.)	110 V DC
	b) AC auxiliary supply voltage for panel anti-condensation heater, spring charging motor and DC failure annunciation scheme.	230 V AC

1.4	Panel board	
	a) Location (Indoor or Outdoor) Indoor	Indoor
	b) Enclosure	IP 4X
	a) Internal arc classification	A FLR
	c) Loss of service continuity category	LSC 2B
	d) Partition class	PM
	e) Rated short-circuit breaking current	31.5kA
	f) Rated short-time withstand current, 3 s	31.5kA
	g) Bus bars- material(Insulated aluminium/Insulated copper)	Insulated aluminium
	h) Earth bus size & material	As per IS: 3043, Bare aluminium
	i) Mimic diagram	Required
	j) Cable entry	bottom
1.5	Circuit breaker	
	a) Nominal System Voltage	11 kV
	b) Highest System Voltage	12 kV
	c) One minute power frequency withstand test voltage	28 kV (Rms)
	d) Impulse withstand test voltage	75 kV (Peak)
	e) Type of breaker	Vacuum
	f) No of poles	3
	g) Type of movable truck (Floor roll out/cassette type)	Floor roll out
	h) Application	Utility distribution network
	i) Breaker closing (Motor charged spring closing/solenoid closing)	Motor charged spring closing
	j) DC auxiliary supply voltage (For shunt trip coil, closing coil, etc.)	110V DC
	k) AC auxiliary supply voltage (For spring charging motor)	230V AC
	l) Anti pumping relay	Required
	m) Positive inter locks	Required
	n) Capacitance current switching class	Class C2
	o) Mechanical and electrical endurance	M2-E2
	p) Total break time	Less than 75ms
	q) Test & Service position limit switches	Required

1.6	Instrument transformers	
	a) PT secondary voltage	110V AC
	b) PT insulation class	Class E
	c) PT accuracy class	Class 1
	d) Current Transformers	
	1) Metering CT	
	Accuracy	Class 1
	Instrument Security Factor	5
	2) Protection CT	
	Accuracy	5P
	Accuracy Limit Factor	10
	3) Differential CT	
	Accuracy	Class PS
	e) CT Insulation Class	E
1.7	Meters	
	a) Make of MFM meter	As per sub vendor list
	b) MFM meter - accuracy class	Class 1
1.8	Push Button	
	a) No of contacts	1 NO+1NC
	b) Current rating	10A
1.9	Protection Relay	
	a) Make of relay	As per sub vendor list
	b) Type	Flush mounted Numerical relay
	c) Application	For feeder and transformer protection
	d) IDMT characteristic	Following IEC curves
	e) Conformal Coating	Required
	f) Relay operation and fault indications	Required
1.10	Painting	Anticorrosive epoxy based powder coating As per Engineering Specification
	a) Final colour	RAL 632/ RAL 7032/ RAL 7035
	b) Mimic diagram	Required
	c) Minimum thickness	90 Microns
1.11	Modbus Gateway	
	a) Make	Schneider Electric
	b) Model	PAS600

2.0	COMPONENT DETAILS – FEEDER WISE						
	Type of feeder	Incomer	Bus coupler	Bus Riser	Outgoing feeder	Transformer feeder type-1 (7MVA)	Transformer feeder type-2 (Up-to 2MVA)
2.1	Number of feeders	2	1	1	5	4	11
2.2	Current Transformers						
	a) For metering - 3 nos.	Reqd.	-	-	Reqd.	Reqd.	Reqd.
	b) For O/C and E/F protection - 3 nos.	Reqd.	-	-	Reqd.	Reqd.	Reqd.
	c) For Differential Protection- 3 nos.	-	-	-	-	Reqd.	-
2.3	Potential Transformers						
	a) On cable side (Draw out dry cast Line PT) (11000/√3) / (110/√3)	Reqd.	-	-	-	-	-
2.4	Lamps						
	a) Breaker ON (Red)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	b) Breaker OFF (Green)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	c) Breaker auto trip (Amber)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	d) Breaker ready for start (Clear)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	e) Trip Circuit Healthy (White)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	f) Breaker spring charged (Blue)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	g) Breaker in Service (Red)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	h) Breaker in Test (Green)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	i) Line PT in Service (Yellow)	Reqd.	-	-	-	-	-
	j) R,Y,B supply indication	Reqd.	-	-	-	-	-
	k) Line Earth truck in service (Yellow)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	l) Bus Earth truck in service (Yellow)	Reqd.	-	-	-	-	-
	m) DC Unhealthy (Blue)	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.

	Type of feeder	Incomer	Bus coupler	Bus Riser	Outgoing feeder	Transformer feeder type-1 (7MVA)	Transformer feeder type-2 (Up-to 2MVA)
2.5	Meters						
	a) MFM meter	Reqd.	-	-	Reqd.	Reqd.	Reqd.
	b) Voltmeter (Analog)	Reqd.	-	-	-	-	-
	c) Ammeter (Analog)	Reqd.	-	-	Reqd.	Reqd.	Reqd.
2.6	Primary protection relays						
	a) Numerical feeder protection and control relay	Reqd.	-	-	Reqd.	Reqd.	Reqd.
	b) Numerical transformer Differential protection and control relay	-	-	-	-	Reqd.	-
	c) Check Synchronisation relay	-	Reqd.	-	-	-	-
	d) Master trip relay	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
2.7	Auxiliary relays						
	a) Anti pumping relay	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	b) Inter trip to down stream	-	-	-	Reqd.	Reqd.	Reqd.
	c) Inter trip from down stream	-	-	-	Reqd.	Reqd.	Reqd.
	d) Down stream breaker status	-	-	-	Reqd.	Reqd.	Reqd.
	e) For transformer oil temperature high alarm	-	-	-	-	Reqd.	Reqd.
	f) For transformer oil temperature trip	-	-	-	-	Reqd.	Reqd.
	g) For transformer winding temperature high alarm	-	-	-	-	Reqd.	Reqd.
	h) For transformer winding temperature trip	-	-	-	-	Reqd.	Reqd.
	i) For transformer Buchholz alarm	-	-	-	-	Reqd.	Reqd.
	j) For transformer Buchholz trip	-	-	-	-	Reqd.	Reqd.
	k) DC failure relay	Reqd.-	Reqd.	Reqd.	Reqd.	Reqd.	Reqd.

	Type of feeder	Incomer	Bus coupler	Bus Riser	Outgoing feeder	Transformer feeder type-1 (7MVA)	Transformer feeder type-2 (Up-to 2MVA)
2.8	Control Switches and Push Buttons						
	a) Breaker Trip-Neutral-Close switch "ODC"	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	b) Control MCB for AC aux. supply	Reqd.	As Reqd.	As Reqd.	Reqd.	Reqd.	Reqd.
	c) Control MCB for DC aux. supply	Reqd.	As Reqd.	As Reqd.	Reqd.	Reqd.	Reqd.
	d) Control MCB & Thermostat for panel anti-condensation heaters	Reqd.	As Reqd.	As Reqd.	Reqd.	Reqd.	Reqd.
	e) Control MCB for Spring Charging Motor	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	f) Test PB for checking healthiness of all indication lamps	Reqd.	As Reqd.	As Reqd.	Reqd.	Reqd.	Reqd.
	g) Ammeter Selector switch	Reqd.	-	-	Reqd.	Reqd.	Reqd.
	h) Voltmeter Selector switch	Reqd.	-	-	-	-	-
2.9	Other Items						
	a) Breaker operation counter	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	b) Panel anti-condensation heater (strip type)	Reqd.	Reqd.	As Reqd.	Reqd.	Reqd.	Reqd.
	c) Low Voltage compartment door switch, panel light and 3 pin socket with switch	Reqd.	Reqd.	Reqd.	Reqd.	Reqd.	Reqd.
	d) Test and service position limit switches	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	e) Emergency stop	Reqd.	Reqd.	-	Reqd.	Reqd.	Reqd.
	f) PT supply change over scheme	-	Reqd.	-	-	-	-

	Type of feeder	Incomer	Bus coupler	Bus Riser	Outgoing feeder	Transformer feeder type-1 (7MVA)	Transformer feeder type-2 (Up-to 2MVA)
	g) Wiring terminals for Spare breaker NO & NC contacts	As Reqd.	As Reqd.	-	As Reqd.	As Reqd.	As Reqd.
	h) Wiring terminals for Spare relay NO & NC contacts	As Reqd.	As Reqd.	-	As Reqd.	As Reqd.	As Reqd.
	i) Wiring terminals for Spare control contactor/relays NO & NC contacts	As Reqd.	As Reqd.	-	As Reqd.	As Reqd.	As Reqd.
	j) 10 window Annunciator for Trip and Non-Trip alarm for transformers	-	-	-	-	Reqd.	Reqd.
	k) Hooter Trip and Non-Trip alarm for transformers	-	As Reqd.	As Reqd.	-	-	-
	l) 24 window Annunciator and hooter for Trip alarm	-	As Reqd.	As Reqd.	-	-	-
	m) 24 window Annunciator and hooter for DC failure alarm	-	As Reqd.	As Reqd.	-	-	-
	n) Surge arrestors	-	-	-	Reqd.	Reqd.	Reqd.
	o) Provision for parallel operation of incomers	As Reqd.	As Reqd.	As Reqd.			

3.0	**OTHER REQUIREMENTS**
3.1	The breakers shall be fully withdrawable truck type. Cassette type breakers are not acceptable.
3.2	The cable compartment shall have ample space for termination kits suitable for XLPE cables of sizes specified in the feeder list and shall have facilities for support of the cables.
3.3	Wiring terminations inside the panels shall be by crimping type lugs only.
3.4	The connection to breaker from main busbars shall be rated for breaker/main busbar rating irrespective of CT rating of outgoing feeders.
3.5	Indicating lamps shall be of Clustered LED type
3.6	The vendor shall provide all software and hardware required for programming numerical relays.
3.7	The vendor shall install two number of Schneider Electric make EcoStruxure Panel Server 'PAS600' as per Engineering Specification CD-CSS-11KV-SB-ES.

PANEL NO	NAME	FEEDER RATING (A)	CT RATIO METERING (CLASS 1)	CT RATIO PROTECTION (CLASS 5P10)	CT RATIO PROTECTION (CLASS PS)	POWER CABLE SIZE
1	SPARE TRANSFORMER FEEDER	630	400/1	400/5	-	2RX3CX300 SQ.MM XLPE
2	BARGE S/S FEEDER	630	400/1	400/5	-	2RX3CX300 SQ.MM XLPE
3	SAP TRANSFORMER NO:1	630	100/1	100/5	-	1RX3CX300 SQ.MM XLPE
4	NPK TRANSFORMER NO:1	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
5	NPK TRANSFORMER NO:2	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
6	PAP TRANSFORMER NO:1	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
7	PAP TRANSFORMER NO:2	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
8	CAPACITOR BANK FEEDER 1	630	400/1	400/5	-	2RX3CX300 SQ.MM XLPE
9	7 MVA TRANSFORMER NO:1	630	400/1	400/5	400/1	2RX3CX300 SQ.MM XLPE
10	7 MVA TRANSFORMER NO:2	630	400/1	400/5	400/1	2RX3CX300 SQ.MM XLPE
11	INCOMER NO:1 WITH LINE PT	1250	1250/1	1250/5	-	4RX3CX400 SQ.MM XLPE
12	BUS COUPLER	1250	-	-	-	
13	BUS RAISER	1250	-	-	-	
14	INCOMER NO:2 WITH LINE PT	1250	1250/1	1250/5	-	4RX3CX400 SQ.MM XLPE
15	7 MVA TRANSFORMER NO:3	630	400/1	400/5	400/1	2RX3CX300 SQ.MM XLPE
16	7 MVA TRANSFORMER NO:4	630	400/1	400/5	400/1	2RX3CX300 SQ.MM XLPE
17	CAPACITOR BANK FEEDER 2	630	400/1	400/5	-	2RX3CX300 SQ.MM XLPE
18	NPK TRANSFORMER NO:3	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
19	NPK TRANSFORMER NO:4	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
20	PAP TRANSFORMER NO:3	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
21	PAP TRANSFORMER NO:4	630	125/1	125/5	-	1RX3CX300 SQ.MM XLPE
22	SAP TRANSFORMER NO:2	630	100/1	100/5	-	1RX3CX300 SQ.MM XLPE
23	BULK S/S FEEDER	630	400/1	400/5	-	2RX3CX300 SQ.MM XLPE
24	SPARE OUTGOING FEEDER	630	400/1	400/5	-	2RX3CX300 SQ.MM XLPE

1.0	**Switch board details**	
1.1	Rated Voltage	
1.2	No. of phases/wires	
1.3	Frequency	
1.4	Continuous rated current	
1.5	Rated short-time withstand current	
1.5.1	a) Main circuit (incomer/busbar/feeder)	
1.5.2	b) Earth circuit	
1.6	Rated peak withstand current	
1.6.1	a) Main circuit (incomer/busbar/feeder)	
1.6.2	b) Earth circuit	
1.7	Location (Indoor or Outdoor)	
1.8	Enclosure	
1.9	Internal arc classification	
1.10	Loss of service continuity category	
1.11	Partition class	
1.12	Cable entry	
1.13	DC auxiliary supply voltage	
1.14	AC auxiliary supply voltage	
1.15	Thickness of panel doors (mm)	
1.16	Thickness of load bearing members (mm)	
1.17	Size of each panel – W x D x H	
1.18	Whether explosion vent is provided in switchboard	
1.19	Details of steps taken to render equipment dust, damp and vermin-proof	
1.20	Details of anti-corrosive treatment to make equipment suitable for the environment	

2.0	**Circuit breaker**	
2.1	Make	
2.2	Country of manufacture	
2.3	Type of circuit breaker	
2.4	Conformity to standards	
2.5	Rated voltage	
2.6	Maximum permissible operating voltage	
2.7	Rated normal current	
2.7.1	a) Incomers	
2.7.2	b) Bus couplers	
2.7.3	c) Outgoing feeders	
2.8	Rated frequency	
2.9	Number of poles	
2.10	Rated insulation level	
2.11	One minute power frequency withstand test voltage	
2.12	Impulse withstand test voltage	
2.13	Type of movable truck (Floor roll out/cassette type)	
2.14	Breaker closing mechanism (Motor charged spring closing/solenoid closing)	
2.15	DC auxiliary supply voltage (For shunt trip coil, closing coil, etc.)	
2.16	AC auxiliary supply voltage (For spring charging motor)	
2.17	Anti pumping relay	
2.18	Capacitance current switching class	
2.19	Mechanical and electrical endurance	
2.20	Total break time	
2.21	Rated symmetrical short circuit breaking capacity	
2.21.1	a) KA	
2.21.2	b) MVA	

2.22	Rated asymmetrical short circuit	
2.23	Rated transient recovery voltage	
2.24	Rated making current (KA peak)	
2.25	Rated short time current	
2.25.1	a) 1 sec	
2.25.2	b) 3 sec	
2.26	Rated duty cycle	
2.27	Opening time	
2.28	Closing time	
2.29	Total break time at rated short circuit capacity	
2.30	Number of aux. Contacts (NO+NC) (without multiplying contactor)	
2.31	Whether manual closing & tripping facility is available in addition to the electrical closing & tripping	
2.32	Whether the circuit breaker is fitted with fixed trip or trip free mechanism	
2.33	Normal voltage of the spring charging motor	
2.34	Power at normal voltage required for spring charging motor	
2.35	Normal and minimum operating voltage of closing mechanism	
2.36	Power at normal voltage required for closing coil	
2.37	Normal and minimum voltage required for trip coil	
2.38	Power at normal voltage required for trip coil	
2.39	Total weight of complete breaker (Kg.)	
3.0	**Main Bus bars**	
3.1	Conformity to standards	
3.2	Material and grade of bus bars	
3.3	Type of busbar covering	
3.4	Continuous current rating	
3.5	Normal area (mm2)	

3.6	Whether the size of bus bars is same throughout switchboard	
3.7	Size of bus	
3.7.1	a) Horizontal	
3.7.1	b) Vertical	
3.8	Colour coding	
3.9	Type of insulation	
3.10	Derating factor applied in view of PVC covering	
3.11	Peak dynamic withstand capacity	
3.12	Details of bus bar supports	
3.13	Rated short time current for 1 second	
3.14	Clearance of bus bars in air	
3.14.1	a) Phase to phase	
3.14.2	b) Phase to earth	
4.0	**Earth busbar**	
4.1	Conformity to standards	
4.2	Material and grade of bus bars	
4.3	Type of busbar covering	
4.4	Continuous current rating	
4.5	Normal area (mm2)	
4.6	Whether the size of bus bars is same throughout switchboard	
5.0	**Current transformers**	
5.1	Conformity to standards	
5.2	Make	
5.3	Whether bar primary/wound	
5.4	VA capacity	
5.5	Insulation class	
5.6	Rated primary current	
5.7	Rated secondary current	
5.8	Epoxy resin cast or other type with details	

5.9	Class of accuracy for O/C & E/F protection	
5.10	Class of accuracy for metering	
5.11	Class of accuracy for differential protection	
5.12	Short time current rating	
5.13	Accuracy limit factor for protection class CTs	
5.14	Instrument security factor for metering CTs	
5.15	Guaranteed temperature rise at rated current	
5.16	One minute power frequency withstand test voltage	
5.17	Impulse withstand test voltage	
5.18	Thermal overload capacity	
6.0	**Potential transformers**	
6.1	Conformity to standards	
6.2	Make of PT's	
6.3	Type	
6.4	Rated primary voltage	
6.5	Rated secondary voltage	
6.6	VA capacity	
6.7	Withdrawable or not	
6.8	Connection	
6.9	Class of accuracy	
6.10	PTs connected to cable side or bus bar side	
6.11	PT mounting position	
6.12	One minute power frequency withstand test voltage	
6.13	Impulse withstand test voltage	

7.0	**Feeder Protection Relays**	
7.1	Conformity to standards	
7.2	Make	
7.3	Type/Model number	
7.4	Number of programmable digital inputs	
7.5	Number of programmable digital outputs	
7.6	Withdrawal features provided or not	
7.7	Mounting: Flush / Projection	
7.8	Whether IDMT characteristics of relay complying with IEC curves	
8.0	**Differential Protection Relays**	
8.1	Conformity to standards	
8.2	Make	
8.3	Type/Model number	
8.4	Number of programmable digital inputs	
8.5	Number of programmable digital outputs	
8.6	Withdrawal features provided or not	
8.7	Mounting: Flush / Projection	
9.0	**Multi Function Meters**	
9.1	Conformity to standards	
9.2	Make	
9.3	Type	
9.4	Mounting: Flush / projection	
9.5	Size of meters	
9.6	Class of accuracy	

10.0	**Indication Lamps**	
10.1	Conformity to standards	
10.2	Make	
10.3	Type	
10.4	Watts rating at specified auxiliary voltage	
10.5	Protective resistors provided or not	
11.0	**Surge arresters**	
11.1	Conformity to standards	
11.2	Make	
11.3	Type	
11.4	Rated voltage	
11.5	Nominal discharge current	
11.6	IEC class	

The following inspection and test shall be conducted and records submitted.

Sl. No.	Description	Ins./Test Reqd	Witness Reqd	Remarks
1.0	Physical verification for compliance with P.O. specifications, scope of work, approved drawings, BOM, etc.	Reqd	Reqd	
2.0	Routine tests			
2.1	High voltage test at power frequency on main circuit	Reqd	Reqd	
2.2	High voltage test at power frequency on auxiliary circuit	Reqd	Reqd	
2.3	Insulation resistance test (Before and after HV Test)	Reqd	Reqd	
2.4	Mechanical operation test	Reqd	Reqd	
2.5	Electrical operation test	Reqd	Reqd	
2.6	Verification of nameplate information & marking	Reqd	Reqd	
2.7	Proper functioning of mechanical, electrical and safety interlocks.	Reqd	Reqd	
2.8	Checking of mechanical work like surface finish, movement and Proper engagement of withdrawable breakers, fixing of doors, etc.	Reqd	Reqd	
2.9	Interchangeability of drawout breakers of the same rating.	Reqd	Reqd	
2.10	Checking of protective earthing circuits	Reqd	Reqd	
2.11	Verification of CT ratio and polarity of CTs.	Reqd	Reqd	
2.12	Verification of PT ratio and polarity of PTs.	Reqd	Reqd	
2.13	Painting shade and thickness	Reqd	Reqd	
2.14	Verification of wiring/scheme checking	Reqd	Reqd	
2.15	Inspection of bus bars and sleeves	Reqd	Reqd	
2.16	Dimensions check	Reqd	Reqd	
2.17	Earth truck/ switch functional and operation test	Reqd	Reqd	
2.18	Visual inspection and verification of Protection and auxiliary relays make, type and functional test as per scheme.	Reqd	Reqd	

Sl. No.	Description	Ins./Test Reqd	Witness Reqd	Remarks
2.19	Measurement of the resistance of the main circuit.	Reqd		Test reports to be submitted
2.20	Tests of the auxiliary electrical devices.	Reqd		
2.21	Dimension and mechanical property of CRCA sheet used.	Reqd		
2.22	Test of Aluminium/copper bus bars used including Electrical, mechanical and chemical property.	Reqd		
2.23	Test of control wires used including rating, size, routine and acceptance test.	Reqd		
2.24	Test of VCB including Resistance measurement, HV test, Opening and closing time, Mechanical operation, Electrical operation and Endurance class.	Reqd		
2.25	Test of Protection and auxiliary relays including functional test, Dielectric test and visual ins	Reqd		
2.26	Routine test of Current transformers including terminal marking, polarity, ratio, Accuracy class and HV test	Reqd		
2.27	Routine test of Potential transformers including terminal marking, polarity, ratio, Accuracy class and HV test	Reqd		
2.28	Routine test of indicating meters including IR test, HV test and functional test.	Reqd		
2.29	Routine test of selector switches including contact resistance, HV test and mechanical operation test.	Reqd		
2.30	Routine test of Surge arresters including reference voltage test, reference current test and partial discharge test.	Reqd		

3.0	Copy of type test certificates/reports of the following tests conducted on representative functional unit to be furnished.
3.1	Impulse voltage dry test.
3.2	Power frequency voltage dry test.
3.3	Temperature rise test.
3.4	Verification of making and breaking capacity.
3.5	Verification of temperature limits and characteristics of relays.
3.6	Short time current tests on main circuits.
3.7	Short time currents tests on earthing circuits.
3.8	Short circuit breaking and making capacity.
3.9	Short time rating of CB and switchboard.
3.10	Mechanical and electrical endurance test.
3.11	Internal arc withstand test.
3.12	Verification of dielectric properties.
3.13	Verification of degree of protection.

Sl. No.	Description	Offer	After commitment	Final	
		Soft copy	Soft copy	Soft copy	Print copy (2 Nos.)
1.0	Duly filled and signed Technical Particulars	Reqd.			
2.0	Duly filled and signed spare part list	Reqd.			
3.0	Duly filled and signed Compliance Statement as per pro forma enclosed.	Reqd.			
4.0	Bill of material for complete switchgear		Reqd.	Reqd.	Reqd.
5.0	Dimensioned general arrangement drawings – internal & external, including busbar disposition		Reqd.	Reqd.	Reqd.
6.0	Sectional views showing the general constructional features of the circuit breaker including operating mechanism, arcing chambers, contacts with lifting dimensions for maintenance.		Reqd.	Reqd.	Reqd.
7.0	Foundation plan showing cut-outs / floor openings and foundation pockets. Loading data and foundation design		Reqd.	Reqd.	Reqd.
8.0	Single line diagram, control schematic, wiring diagrams, inters panel wiring, terminal and bus wiring diagrams.		Reqd.	Reqd.	Reqd.
9.0	Characteristic curves of relays and their range of adjustments.		Reqd.	Reqd.	Reqd.
10.0	Relay coordination details/relay settings with recommended settings, calculations etc.		Reqd.	Reqd.	Reqd.
11.0	All Type test reports as per Scope of inspection and tests			Reqd.	Reqd.
12.0	All Routine test reports as per Scope of inspection and tests			Reqd.	Reqd.
13.0	Technical literatures, pamphlets and brochures relating to the various equipments used.			Reqd.	Reqd.
14.0	Operation and Maintenance manuals.			Reqd.	Reqd.

Sl. No.	Description	Quantity
1.0	Spare incomer breaker with trolley and 3 phase line PT mounted	1 No.
2.0	Spare outgoing breaker with trolley	1 Number of each size and rating.
3.0	Numerical feeder protection and control relay	1 No of each type.
4.0	Numerical transformer differential protection and control relay	1 No of each type.
5.0	Single phase Current transformer for measurement/protection	Each type and rating- 2 numbers.
6.0	Single phase Current transformer for differential protection	Each type and rating- 2 numbers.
7.0	PT primary fuse (11kV)	5 Nos. of each rating.
8.0	PT secondary fuse/MCB	3 Nos.
9.0	Spring charging motor	1 No.
10.0	Surge arresters	6 Nos.
11.0	TNC control switch	2 Nos.
12.0	Closing coil	2 Nos.
13.0	Tripping coil	2 Nos.
14.0	Ammeter selector switch	2 Nos.
15.0	Voltmeter selector switch	2 Nos.
16.0	Bus support insulator used in bus bar compartment (11kV)	5 Nos. of each type.
17.0	Bus support insulator used in cable compartment (11kV)	5 Nos. of each type.
18.0	Anti - pumping relay	2 No.
19.0	DC failure relay/contactor	2 No.
20.0	Master trip relay	2 No.
21.0	24 window annunciator for suitable for 85-230V AC/DC	1 No.
22.0	10 window annunciator for suitable for 85-230V AC/DC	1 No.
23.0	Hooter suitable for 85-230V AC/DC	1 No.
24.0	LED Indication lamps 110V DC(Red, Yellow, Blue, Green, Clear, White, Amber)	Each colour- 5 numbers.
25.0	LED Indication lamps 110V AC(Red, Yellow, Blue)	Each colour- 3 numbers.
26.0	Service/Test limit switches	Each type and rating- 2 numbers.
27.0	Limit switches used in VCB	Each type and rating- 2 numbers.
28.0	Electrical Contact grease (Mosil EC-111 or equivalent)	5 Kg.

SUB VENDOR LIST	11kV, 1250A, 31.5kA, AIR-INSULATED SWITCHBOARD	CD-CSS-11KV-SB-SVL	
		PAGE 1 OF 1	R0

Acceptable makes of switchgears are listed below.

AIR-INSULATED SWITCHBOARD

SIEMENS
SCHNEIDER ELECTRIC
ABB
L&T
CROMPTON

PROTECTIVE RELAYS

SIEMENS
SCHNEIDER ELECTRIC
ABB
L&T
CROMPTON
ALSTOM/AREVA
GE
EASUN REYROLLE

CONTROL & SELECTOR SWITCHES

KAYCEE
ALSTOM
SULZER
SIEMENS
EASUN REYROLLE
KHAITAN
JYOTI
ABB
L&T
SCHNEIDER ELECTRIC

MULTI FUNCTION METER

SCHNEIDER ELECTRIC
SIEMENS
ABB
AUOTMATIC ELECTRIC
RISHAB
MECO
SELEC

HRC FUSES/MCB

SIEMENS
L&T
HAVELLS
ALSTOM
BUSSMAN
SCHNEIDER ELECTRIC
ABB

INSRUMENT TRANSFORMERS

AUTOMATIC ELECTRIC
PRAGATHI
SILKANS
SIEMENS
ALSTOM /AREVA
ABB
ECS
INTRANS
KAPPA
SCHNEIDER ELECTRIC
L&T

COMPLIANCE STATEMENT	11kV, 1250A, 31.5kA, AIR-INSULATED SWITCHBOARD	CD-CSS-11KV-SB-CS	
		PAGE 1 OF 1	R0

We here by state that our Quotation No ..... is in full compliance with the documents issued against the Enquiry No ..... except for the deviations listed below.

LIST OF DEVIATIONS

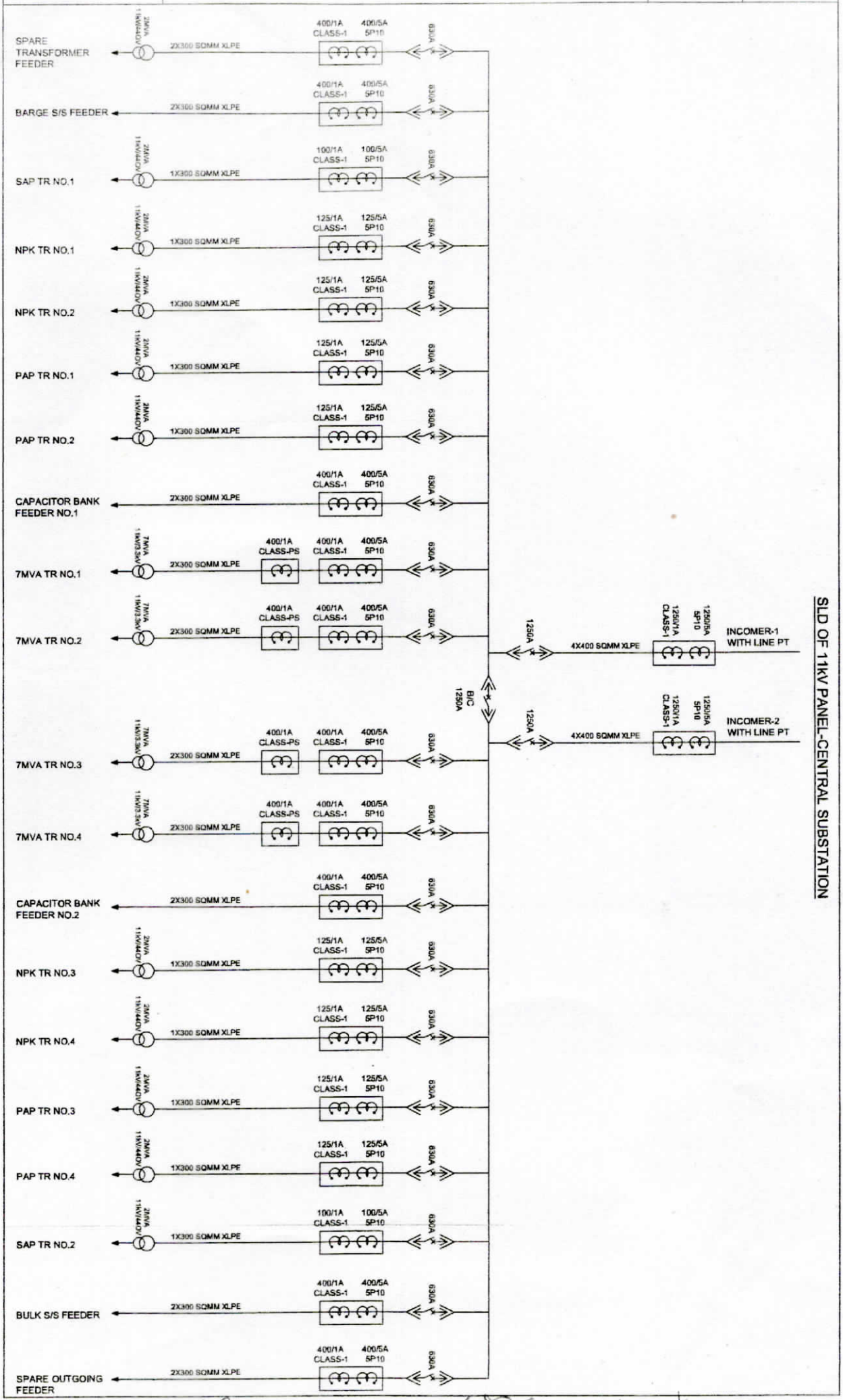
Sl. No.	Description	Reasons for Deviation

Name of Vendor:

Date: Name & Designation Signature & Seal

Sl. No.	Description	Quantity	Unit price	Tax	Total price
1.0	Design, engineering, manufacturing, shop testing, inspection, packing, delivery to site of 11kV, 1250A, 31.5kA, LSC2B, PM, IAC AFLR, Indoor, 24 panel switchboard for Central substation, conforming to the attached specifications/documents.	1 NO			
2.0	Supply of spares as per Spares List CD-CSS-11KV-SB-SL.	1 SET			
3.0	Installation and commissioning support as per Engineering Specification CD-CSS-11KV-SB-ES.	6 Man Days			

SINGLE LINE DIAGRAM	11kV, 1250A, 31.5kA, AIR-INSULATED SWITCHBOARD	CD-CSS-11KV-SB-SLD	
		PAGE 1 OF 1	R0



ELIGIBILITY CRITERIA

TENDER No. MM/172/G30501 Dated 14.01.2025

Sl No	Eligibility Criteria - Conditions	Documents to be submitted along with bid	Remarks	Bidders compliance
1	a) The Bidder shall be a manufacturer of High Voltage Switchboard or their authorised dealer/ distributer/ channel partner. b) The OEM shall be in the business of supply of high voltage switch boards for more than 5 years as on the final due date of the submission of technical bid. c) The OEM of High Voltage Switchboard shall also be the manufacturer of Vacuum Circuit Breaker used in the Switchboard. d) The bidder shall supply OEM's factory assembled switchboards only.	1. Self-declaration from manufacture OR valid authorization letter from the manufacture in the case of authorized dealer/distributor/channel partner. 2. The catalogue and specifications of VCBs manufactured by OEM. 3. Supporting documents to prove the infrastructure of OEM's factory. 4. Relevant supporting documents to satisfy PQ conditions/s, on 5 years business experience.	Relevant documents required	
2	The bidder or OEM shall have successfully completed Purchase/work orders as per any one of the three conditions given below for supply of high voltage switch gears (Voltage rating 11 kV or above) during the last 10 years in any industrial / commercial establishments as on the final due date of the submission of technical bid. a) One work of similar nature as per the scope of work, costing not less than Rs. 2,16,00,000/- b) Two works of similar nature as per the scope of work, each costing not less than RS. 1,35,00,000/- c) Three works of similar nature as per scope of work each costing not less RS. 1,08,00,000/-	1. Copies of Purchase Orders/Work Orders. 2. Completion certificate/ dispatch documents /final invoice etc. of the respective orders to prove successful completion of the work.	Relevant documents required	
4	a) Average annual turnover of the bidder for the last three financial years ending on 31-03-2024 shall be at least Rs. 540/- Lakhs or above and b) Annual turnover for each year shall be at least Rs. 81 /- lakhs or above during the last three financial years ending on 31-03-2024	Self-attested copies of audited financial statements (Profit & Loss Account and Balance Sheet) for the last three financial years ending on 31-03-2024	Relevant documents required	

NOTE: -

1) All the documents submitted in proof of the Eligibility criteria shall be attested by the authorized signatory of the bidder. FACT shall be at liberty to verify the data / documents s submitted by the Bidders with clients / users.
2) Only Bids which are eligible as per the criteria will be considered for Technical Evaluation. Technically and commercially acceptable Bids will only be considered for Price Bid opening.
3) Submission of authentic documents for meeting the above technical and financial criteria is the prime responsibility of the Bidder. Wherever FACT has concern or apprehension regarding the authenticity/ correctness of any document, FACT reserves the right of getting the documents cross verified from the document issuing authority.
4) IMPORTANT: In case of ambiguity or incomplete or non submission of required relevant documents along with bid, FACT reserves the right, at its option, to reject the Bidders Bid without assigning any reason and without notice.

COMPLIANCE STATEMENT

Sl. No.	Terms	Bidder confirmation
1	All quotations shall be as per the TPS CD-CSS-11kV-SB R0	
2	Routine & acceptance tests shall be performed at OEM's Factory in the presence of FACT's representative and test reports shall be submitted.	
3	The material under order shall be guaranteed against poor workmanship, design and material for a period (including defect liability period) of 12 months from the date of putting the item into operation or 18 months from the date of supply, whichever is earlier.	
4	The vendor shall supply the items within 24 weeks from the date of receipt of approved drawings / documents.	
5	Please confirm : Price Basis – FOR FACT Stores (as per Gem T & C)	
6	Please confirm : Taxes and Duties - The Price offered in GEM is all inclusive of TAX. (as per Gem T & C)	
7	Please confirm: Supply: Payment of 90% of supply value shall be made within 30 days from receipt of material at site. Balance 10% payment along with full taxes and duties shall be made upon submission of 10% PBG. Supervision of Installation & Commissioning: On a pro-rata basis as and when the services are completed, in 30 days from providing the invoice and time sheet duly certified by FACT site Engineer.	
8	Please confirm : Liquidated Damages: As per GeM – "@ 0.5% of the contract value of delayed quantity per week or part of the week of delayed period as pre-estimated damages not exceeding 10% of the contract value of delayed quantity without any controversy/dispute of any sort whatsoever"(as per GeM T & C)	
9	Please Confirm: A Performance Bank Guarantee @10% (Ten Percent) of the total basic order value shall be furnished along with the supply/documents valid for the Guarantee period and with a claim period of 6 months in the FACT provided proforma.	

Note : All the above columns shall be filled properly, without leaving blanks. Please upload / return this document duly filled-in, along with your bid.

(To be executed on ₹ 500/- Non-judicial Stamp Paper)

INTEGRITY PACT

Between

The Fetilizers and Chemicals Travancore Limited (FACT), a company formed and registered under the Travancore Companies Act IX to 1114 (Companies Act, 2013) and having its registered office at Eloor, Udyogamandal-683501, Kochi, Ernakulam District, Kerala, hereinafter referred to as "The Principal".

And

..... hereinafter referred to as "The Bidder/ Contractor".

Preamble

The Principal intends to award, under laid down organization procedures, contract/s for ..... The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness / transparency in its relations with its Bidder(s) and or/Contractor(s).

In order to achieve these goals, the Principal will appoint an Internal External Monitor (EIM), who will monitor the tender process and execution of the contact for compliance with the principle mentioned above.

Section 1 - Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a) No employee of the Principal, personally or through family members, will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b) The Principal will, during the tender process, treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c) The Principal will exclude from the process all known prejudiced/interested persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the India Penal Code / Prevention of Corruption Act, or if there be a substantive suspicion in this regard, the Principal will inform the Vigilance Officer and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s) / Contractor(s)

(1)The Bidder(s) / Contractor(s) commits themselves to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

a) The Bidder(s) / Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person, any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange, any advantage of any kind whatsoever during the tender process or during the execution of the contract.

b) The Bidder(s) / Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.

c) The Bidder(s) / Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder(s) / Contractor(s) of foreign origin shall disclose the name and address of the Agents / Representatives in India, if any. Similarly, The Bidder(s) / Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. All the payments made to the India agent/representative have to be in Indian rupees only.

e) The Bidder(s) / Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to, or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder(s) / Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s), before award or during the execution of has committed a transgression through a violation of Section 2 above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or to terminate the contract, if already signed, for such reason.

Section 4 - Compensation for Damages

(1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the contract value or the amount equivalent to Performance Bank Guarantee.

Section 5 - Previous Transgression

(1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in India conforming to the anti-corruption approach including Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process and appropriate action can be taken including termination of contract, if already awarded, for such reason.

Section 6 - Equal treatment of all Bidders / Contractors / Subcontractors

(1)The Bidder(s)/Contractor(s) undertakes(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

(2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors/Suppliers and Subcontractors.

(3) The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Section 7 – Criminal charges against violating Bidder(s) / Contractor(s) /Subcontractor(s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor, or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8 - Independent External Monitor/Monitors

(1)The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. It will be obligatory for him to treat the obligations and document of the Bidder(s)/Contractor(s) as confidential. He reports to the Chairperson and managing Director, FACT.

(3) The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the

Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to this project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/ Subcontractor(s) with confidentially.

(4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

(5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or to take corrective action, or to take other relevant action. The Monitor can in this regard submit non-binding recommendation. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

(6) The Monitor will submit a written report to the Chairman and Managing Director, FACT within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

(7) Monitor shall be entitled to compensation on the same terms as being extended to / provided to Independent Director on FACT Board.

(8) If the Monitor has reported to the Chairman and Managing Director, FACT, a substantiated suspicion of an offence under relevant IPC/PC Act, and the Chairman and Managing Director, FACT has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

(9) The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by the Chairman and Managing Director, FACT

Section 10 - Other provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Udyogamandal, Kerala.

(2)Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

(4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(5) The Bidder / Contractor signing this "Integrity Pact" shall not approach the court while representing the matters to IEMs and he/she shall wait their decisions in this matter.

(For & On behalf of the Principal)	For & On behalf of Bidder(s)/Contractor(s)
(Office Seal)	(Office Seal)

Place:
Date:

Witness1:	Witness 2:
(Name & Address)….....	(Name & Address)….....

(To be given on ₹ 200/- stamp paper)

PROFORMA OF BANK GUARANTEE FOR PERFORMANCE

(To be obtained from a Nationalised/scheduled bank in India)

The Fertilizers And Chemicals Travancore Ltd.,
Udyogamandal

This deed made the ..... day of ..... Two Thousand…….. by.....Bank, a Bank incorporated in ..... and having its Registered Office at ..... (hereinafter called 'The Bank' which expression shall include its successors & assigns)

AND WHEREAS The Fertilisers And Chemicals Travancore Ltd, Udyogamandal P.O., Kerala (hereinafter called 'The Company') has placed an Order with M/s.....(hereinafter called 'The Supplier/Contractor') in terms of Order No..... dated.....for the supply/work of..... at a total cost of ₹..... (Rupees.....only)

AND WHEREAS the said Company has called upon the said Supplier/Contractor to give a Bank Guarantee for ₹ ..... (Rupees..... only) equal to..... % of the above Order towards due performance of the equipment/spare parts/materials in terms and conditions contained in the said Order.

AND WHEREAS the said Company has agreed to accept a guarantee from us.

We, the said Bank do hereby undertake to pay the Company an amount not exceeding ₹..... (Rupees..... .....only) against any loss or damage caused to or suffered by or would be caused to or suffered by the Company by reason of any breach by the said Supplier/Contractor of any of the terms and conditions of the said Order.

We, ..., do hereby undertake to pay the amount due and payable under this guarantee without any demur merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or suffered by or would be caused to or suffered by the Company by reason of breach by the said Supplier/Contractor of any of the terms and conditions contained in the said Order. Any such demand made on the Bank shall be final, conclusive and binding on the Bank as regards the amount due and payable by the Bank under this guarantee.

We undertake to pay to the Company any money so demanded notwithstanding any dispute or disputes raised by the Supplier/Contractor in any suit or proceeding pending before any court or Tribunal relating thereto, our liabilities under this present being absolute and unequivocal.

The payment so made by us under this guarantee shall be valid discharge of our liability for payment there under and the Supplier/Contractor shall have no claim against us for making such payment.

We, ..., further agree that the guarantee herein contained shall remain in full force until performance warranty period has expired and all other conditions have been fulfilled in terms of the Order by the Supplier/Contractor and the Company discharges the guarantee accordingly.

We, ..., further agree with the said Company that they shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Order or to extend time of performance by the said Supplier/Contractor or to postpone for any time and from time to time any of the powers exercisable by the Company against the said Supplier/Contractor and to forebear or enforce any of the terms and conditions relating to the said Order or securities available to the Company and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Supplier/Contractor or for any forbearance, act or omission on the part of the Company or any indulgence by the Company to the said Supplier/Contractor or any other matter or thing which under the law relating to sureties, but for this provision, have the effect of so relieving us.

This guarantee shall not be affected by any change in the constitution of the Bank or the Company or the said Supplier/Contractor nor shall this guarantee be affected by any change in the constitution of the Company or the said Supplier/Contractor by absorption with any other body or corporation and this guarantee shall be available to or enforceable by such body or corporation.

Our guarantee shall remain in force until..... Unless a claim or demand is made within six months after the expiry of the guarantee, all the Company's rights under the guarantee shall be deemed as waived/forfeited and we shall be relieved and discharged from all liabilities there under. Notwithstanding anything contained hereinbefore, our liability under this guarantee shall be limited to an amount not exceeding ₹ ..... (Rupees…….....……. only)

Any notice by way of request, demand or otherwise hereunder may be sent by post to the Bank addressed as aforesaid and if sent by post, it shall be deemed to have been given at the time when it would be delivered in due course of post and in proving such notice when given by post, it shall be sufficient to prove that the envelope containing the notice was so posted and certificate signed by an officer of the Company that the envelope was so posted, shall be conclusive.

Disputes/differences, if any, relating to or arising out of this Bank Guarantee, shall be settled by courts having Jurisdiction over Udyogamandal, in Kerala State, where the registered office of the Company is situated and no other court shall have jurisdiction in the matter.

We, ..., Bank lastly undertakes not to revoke this guarantee during its currency except with the previous consent of the Company in writing.

Dated this ..... day of ..... Two Thousand.....

For (Name of Bank)

Authorised Official

Name:

Designation:

Place:
Full address of the Branch issuing this guarantee