Annexure-I

OIL INDIA LIMITED
(A Government of India Enterprise)
P.O. Duliajan-786602, Assam, India
E-mail: material@oilindia.in

INVITATION FOR LOCAL COMPETITIVE BID

OIL INDIA LIMITED invites Local Competitive Bid (LCB) through its e-procurement portal https://etender.srm.oilindia.in/irj/portal for the following items:

E-Tender No	Bid Closing/Opening Date	Item Description
SDI0012P16 Dtd. 25.01.2016 (Single Stage Composite Bid System)	**17.03.2016**	**PRINTERS**
SDI0026P16 Dtd. 26.01.2016 (Single Stage Composite Bid System)	**17.03.2016**	**PLOTTERS**
SDI0043P16 Dtd. 27.01.2016 (Single Stage Composite Bid System)	**17.03.2016**	**PRIME MOVER**
SDI9439P16 Dtd; 03.12.2015 (Single Stage Two Bid System)	**17.03.2016**	**SECURITY PANEL FENCING**
SDI9424P16 DT: 03.12.2015 (Single Stage Two Bid System)	**17.03.2016**	**TRANSFORMER 2000KVA**
SDI0044P16 DT; 27.01.2016 (Single Stage Two Bid System)	**17.03.2016**	**11KV VCB PANEL**

Tender fee (Non-refundable): Rs 1,000.00; Bid Closing/Opening Time: **(11 Hrs.) IST/(14 Hrs.) IST**; Period of sale of documents: **Till one week prior to bid closing date**. The complete bid documents and details for purchasing bid documents, participation in E-tenders are available on OIL's e-procurement portal https://etender.srm.oilindia.in/irj/portal as well as OIL's website www.oil-india.com.

NOTE: All addenda, Corrigenda, time extension etc. to the tenders will be hosted on above website and e- portal only and no separate notification shall be issued in the press. Bidders should regularly visit above website and e-portal to keep themselves updated.

OIL INDIA LIMITED
(A Government of India Enterprises)
PO : Duliajan – 786602
Assam (India)

TELEPHONE NO. (91-374) 2808719
FAX NO: (91-374) 2800533
Email: ranjanbarman@oilindia.in ; erp_mm@oilindia.in

FORWARDING LETTER

Tender No. : **SDI0044P16 DT: 27.01.2016**

Tender Fee : **Rs 1,000.00**

Bid Security Amount : **Applicable**

Bidding Type : **SINGLE STAGE TWO BID SYSTEM**

Bid Closing on : **As mentioned in the e-portal**

Bid Opening on : **-do-**

Performance Security : **Applicable**

Integrity Pact : **Applicable**

OIL invites Bids for **Supply, Installation, Testing & Commissioning of 16 nos 11 KV Indoor Type Panels along with dismantling and buy back of 18 nos old 11 KV panels of Duliajan Power Station** through its e-Procurement site under **SINGLE STAGE TWO BID SYSTEM**. The bidding documents and other terms and conditions are available at Booklet No. MM/LOCAL/E-01/2005 for E-Procurement LCB Tenders. The prescribed Bid Forms for submission of bids are available in the Technical RFx -> External Area - > Tender Documents

The general details of tender can be viewed by opening the RFx [Tender] under RFx and Auctions.. The details of items tendered can be found in the Item Data and details uploaded

The tender will be governed by:

a) For technical support on various matters viz. Online registration of vendors, Resetting of Passwords, submission of online bids etc, vendors should contact OIL's ERP MM Deptt at following: Tel Nos = 0374-2807171 , 0374-2807192. Email id = erp_mm@oilindia.in.

b) OIL's office timings are as below:

	Time (in IST)
Monday – Friday	**07.00 AM to 11.00 AM; 12.30 PM to 03.30 PM**
Saturday	**07.00 AM to 11.00 AM**
Sunday and Holidays	**Closed**

Vendors should contact OIL officials at above timings only.

c) "General Terms & Conditions" for e-Procurement as per Booklet No. MM/LOCAL/E-01/2005 for E-Procurement LCB Tenders.

d) Technical specifications and Quantity as per **Annexure – 1A**.

e) The prescribed Bid Forms for submission of bids are available in the Technical RFx -> External Area - > Tender Documents.

f) In the event of receipt of only a single offer against the tender within B.C. date, OIL reserves the right to extend the B.C. date as deemed fit by the Company. During the extended period, the bidders who have already submitted the bids on or before the original B.C. date, shall not be permitted to revise their quotation.

g) All corrigenda, addenda, amendments, time extension, clarifications etc. To the tender will be hoisted on OIL's website (www.oil-india.com) and in the e-portal (https://etenders.srm.oilindia.in/irj/portal) only and no separate notification shall be issued in the press. Prospective bidders are requested to regularly visit the website and e-portal to keep themselves updated.

h) Any sum of money due and payable to the contractor (including Security Deposit refundable to them) under this or any other contract may be appropriated by Oil India Limited and set-off against any claim of Oil India Limited (or such other person or persons contracting through Oil India Limited) for payment of sum of money arising out of this contract or under any other contract made by the contractor with Oil India Limited (or such other person or persons contracting through Oil India Limited).

i) Bidder are advised to fill up the Technical bid check list (**Annexure EEE**) and Response sheet (**Annexure FFF**) given in MS excel format in Technical RFx -> External Area - > Tender Documents. The above filled up document to be uploaded in the Technical RFX Response.

Special Note:

1.0 General Qualification Criteria:

In addition to the general BRC/BEC, following criteria on Bidders' Experience and their financial capabilities shall be considered **(documentary evidence to be provided along with the bid in Technical RFx -> External Area - > Tender Documents)** as on the Bid Closing Date:

Criteria	**Complied / Not Complied.** **Documentary evidence submitted / not submitted**
a) Bidder should have experience of successfully executing similar order of Rs **25.11 Lakhs** during last 3 years. Similar order means Supply, Installation, Testing, Commissioning & Energisation of 11KV Indoor Type Switchgear Panels.	
b) Annual financial turnover of the firm in any of the last 3 financial years or current financial year should not be less than **Rs 83.70 Lakhs.**	

Note: Documentary evidence in respect of the above should be submitted in the form of copies of relevant Purchase Orders along with copies of any of the documents in respect of satisfactory execution of each of those Purchase Orders, such as – (i) Satisfactory Inspection Report (OR) (ii) Satisfactory Supply Completion / Installation Report (OR) (iii) Consignee Receipted Delivery Challans (OR) (iv) Central Excise Gate Pass / Tax , Invoices issued under relevant rules of Central Excise / VAT (OR) (v) any other documentary evidence that can substantiate the

satisfactory execution of each of the purchase orders cited above. For Annual financial turnover enclose the audited Annual Reports or balance sheet certified by a chartered accountant.

2.0 Vendors having OIL's User ID & password shall purchase bid documents on-line through OIL's electronic Payment Gateway upto one week prior to the Bid closing date (or as amended in e-portal).

Vendors who do not have OIL's User ID & password shall obtain User ID & password through online vendor registration system in e-portal and can subsequently purchase bid documents through OIL's electronic Payment Gateway upto one week prior to the Bid closing date (or as amended in e-portal).

Alternatively application showing full address/email address with Tender Fee (Non-refundable) of Rs. 1,000.00 in favour of M/s Oil India Limited and payable at Duliajan is to be sent to Head-Materials, Oil India Limited, P.O. Duliajan, Assam-786602. Application shall be accepted only upto one week prior to the Bid closing date (or as amended in e-portal). The envelope containing the application for participation should clearly indicate "REQUEST FOR ISSUE OF USER ID AND PASSWORD FOR E TENDER NO …" for easy identification and timely issue of user ID and password. On receipt of requisite tender fee, USER_ID and initial PASSWORD will be communicated to the bidder (through e-mail) and will be allowed to participate in the tender through OIL's e- Procurement portal. No physical tender documents will be provided. Details of NIT can be viewed using "Guest Login" provided in the e-Procurement portal. The link to e-Procurement portal has been also provided through OIL's web site www.oil-india.com.

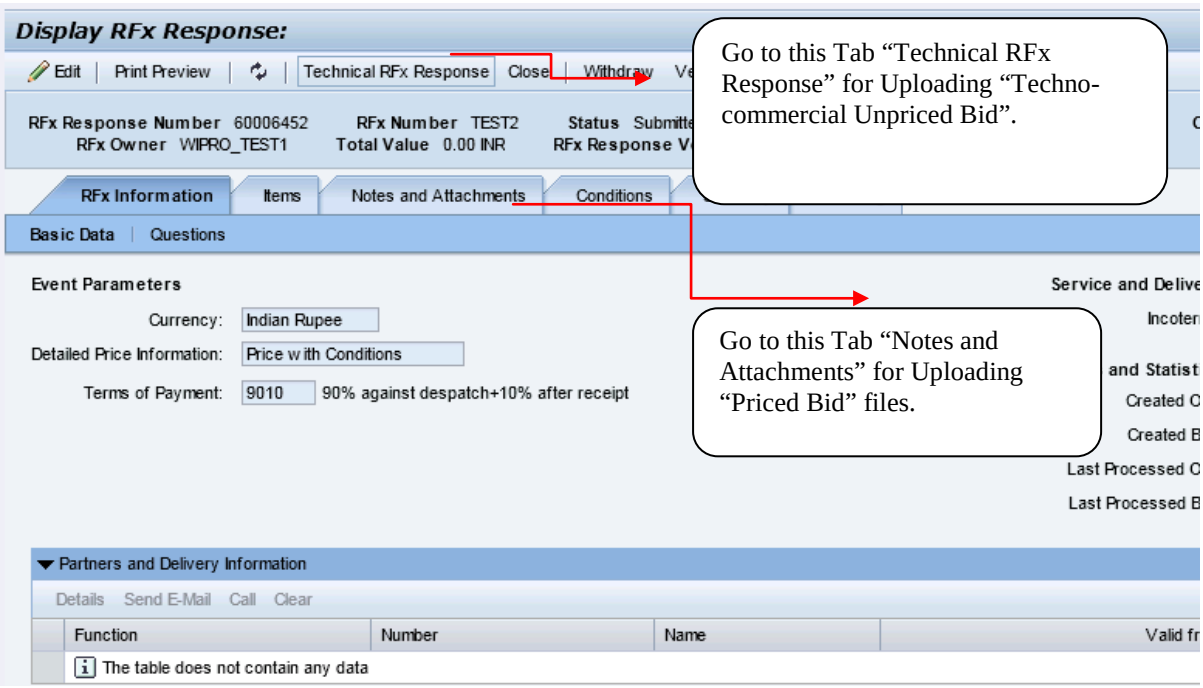
NOTE:
PSUs and MSE units are provided tender documents Free of Cost (as per govt guidelines), however they have to apply to OIL's designated office to issue the tender documents one week prior to the Bid closing date (or as amended in e-portal).

3.0 The tender is invited under SINGLE STAGE-TWO BID SYSTEM. The bidders are required to submit both the "TECHNO-COMMERCIAL UNPRICED BID" and "PRICED BID" through electronic format in the OIL's e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender.

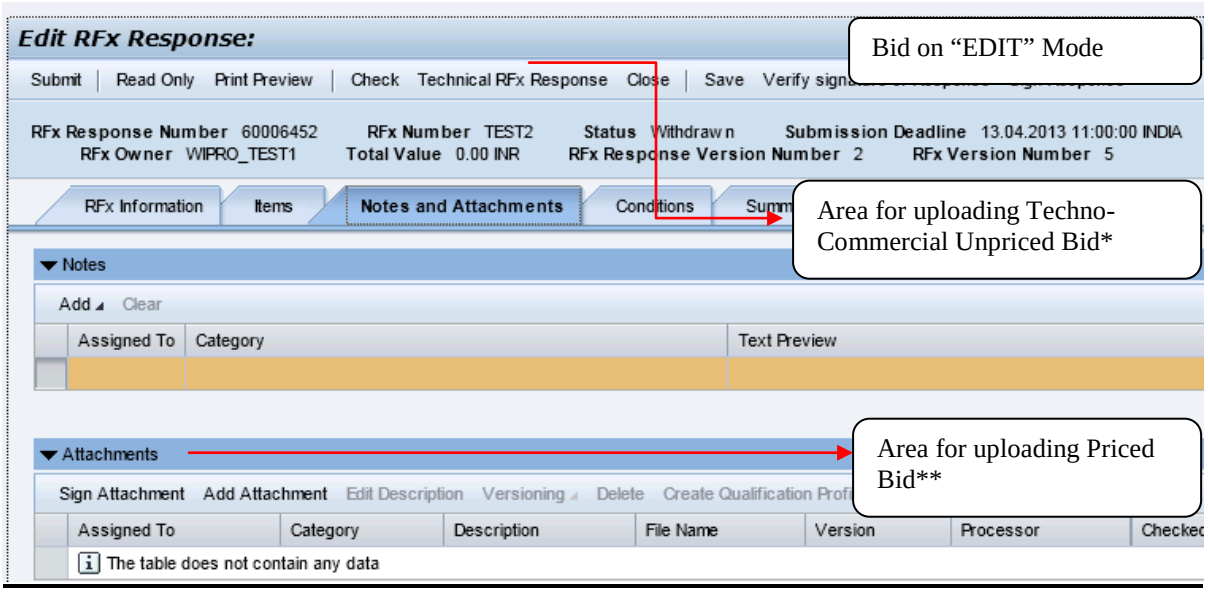
3.1 Please ensure that Technical Bid / all technical related documents related to the tender are uploaded in the Technical RFx Response-> User - > Technical Bid only**.** The "**TECHNO-COMMERCIAL UNPRICED BID**" shall contain all techno-commercial details **except the prices**. **Please note that no price details should be uploaded in** Technical RFx Response**.**

3.2 The "**PRICE BID**" must contain the price schedule and the bidder's commercial terms and conditions.**The prices of the items should be quoted in "Conditions Tab". Details of prices as per Bid format / Commercial bid to be uploaded as Attachment under the attachment option under "Notes & Attachments". (As per Price Schedule Uploaded)**

3.3 A screen shot in this regard is given below. Offer not complying with above submission procedure will be rejected as per Bid Rejection Criteria mentioned in Annexure-CCC.



On "EDIT" Mode- The following screen will appear. Bidders are advised to Upload "Techno-Commercial Unpriced Bid" and "Priced Bid" in the places as indicated above:



Note :

* The "Techno-Commercial Unpriced Bid" shall contain all techno-commercial details **except the prices**.

** The "Price bid" must contain the price schedule and the bidder's commercial terms and conditions. For uploading Price Bid, first click on Sign Attachment, a browser window will open, select the file from the PC and click on Sign to sign the Sign. On Signing a new file with extension .SSIG will be created. Close that window. Next click on Add Atachment, a browser window will open, select the .SSIG signed file from the PC and name the file under Description, Assigned to General Data and clock on OK to save the File.

4.0 Please note that all tender forms and supporting documents are to be submitted through OIL's e-Procurement site only except following documents which are to be submitted manually in sealed envelope super scribed with **Tender no.** and **Due date** to **Head**

Materials, Materials Department, Oil India Limited, Duliajan - 786602, Assam on or before the Bid Closing Date and Time mentioned in the Tender.

a) **Original Bid Security**
b) **Detailed Catalogue (if any)**
c) **Any other document required to be submitted in original as per tender requirement**

All documents submitted in physical form should be signed on all pages by the authorised signatory of the bidder and to be submitted in Duplicate.

5.0 Benefits to Micro & Small Enterprises (MSEs) as per OIL's Public Procurement Policy for Micro and Small Enterprises (MSEs) shall be given. Bidders are requested to go though ANNEXURE – I of General Terms and Conditions for E- PROCUREMENT LCB TENDERS (MM/LOCAL/E-01/2005) for more details. MSE bidders are exempted from submission of Tender Fees and Bid Security/Earnest Money provided they are registered for the items they intend to quote.

6.0 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the NIT or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in rejection of its offer without seeking any clarifications.

7.0 Bidders must ensure that their bid is uploaded in the system before the tender closing date and time. Also, they must ensure that above documents which are to be submitted in a sealed envelope are also submitted at the above mentioned address before the bid closing date and time failing which the offer shall be rejected.

8.0 Bid must be submitted electronically only through OIL's e-procurement portal. Bid submitted in any other form will be rejected.

9.0 **SINGLE STAGE TWO BID SYSTEM** shall be followed for this tender and only the PRICED-BIDS of the bidders whose offers are commercially and technically acceptable shall be opened for further evaluation.

10.0 **a) The Integrity Pact is applicable against this tender. Therefore, please submit the Integrity Pact document duly signed along with your quotation as per BRC. OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure DDD of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be submitted by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.**

b) The name of the OIL's Independent External Monitors at present are as under:

SHRI RAJIV MATHUR, IPS (Retd.)
Former Director, IB, Govt. of India,
e-Mail ID : rajivmathur23@gmail.com

11.0 The tender shall be governed by the Bid Rejection & Bid Evaluation Criteria given in enclosed **Annexure-CCC**. However, if any of the Clauses of the Bid Rejection Criteria /

Bid Evaluation Criteria (as per **Annexure-CCC**) contradict the Clauses of the tender and / or "General Terms & Conditions" as per Booklet No. MM/LOCAL/E-01/2005 for E-procurement (LCB Tenders) elsewhere, those in the BEC / BRC shall prevail.

12.0 To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by the company, failing which the offer will be summarily rejected.

13.0 Please do refer the User Manual provided on the portal on the procedure How to create Response for submitting offer.

14.0 If Bank Guarantee is submitted towards 'Bid Security', then bidders have to ensure that the Bank Guarantee issuing bank indicate the name and detailed address (including e-mail) of their higher office from where confirmation towards genuineness of the Bank Guarantee can be obtained.

NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

Yours Faithfully

Sd-
(R BARMAN)
SR MANAGER MATERIALS (IP)
FOR : HEAD-MATERIALS

Annexure - CCC

Tender No & Date: SDI0044P16 DT: 27.01.2016

BID REJECTION CRITERIA (BRC) / BID EVALUATION CRITERIA (BEC)

The following BRC/BEC will govern the evaluation of the bids received against this tender. Bids that do not comply with stipulated BRC/BEC in full will be treated as non responsive and such bids shall prima-facie be rejected. Bid evaluation will be done only for those bids that pass through the "Bid Rejection Criteria" as stipulated in this document.

Other terms and conditions of the enquiry shall be as per General Terms and Conditions vide MM/LOCAL/E-01/2005 for E-Procurement LCB Tenders. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (BRC / BEC) contradict the Clauses of the tender or MM/LOCAL/E-01/2005 elsewhere, those in the BRC / BEC shall prevail.

Criteria	Complied / Not Complied. (Remarks if any)
1.0 BID REJECTION CRITERIA (BRC): **A) COMMERCIAL:** i) Validity of the bid shall be minimum 120 days from the Bid Closing Date. ii) Bid security: The bid must be accompanied by Bid Security of **Rs 83,,700.00** in OIL's prescribed format as Bank Guarantee or a Bank Draft/Cashier cheque in favour of OIL. The Bid Security may be submitted manually in sealed envelope superscribed with Tender no. and Bid Closing date to Head Materials, Materials Department, Oil India Limited, Duliajan- 786602, Assam on or before the Bid Closing Date and Time mentioned in the Tender. **The Bank Guarantee towards Bid Security shall be valid for 10 months from Bid closing date. (i.e. upto 17.01.2017).** **Bid Security may also be paid online on or before the Bid Closing Date and Time mentioned in the Tender.** **If bid security in ORIGINAL of above mentioned Amount and Validity is not received or paid online within bid closing date and time, the bid submitted through electronic form will be rejected without any further consideration.** For exemption for submission of Bid Security, please refer Clause No. 8.8 of General Terms and Conditions vide MM/LOCAL/E-01/2005 for E-Procurement LCB Tenders. **The format of Bank Guarantee towards Bid Security (Annexure – VII) has been amended to Annexure – VII (Revised) and bidders should submit Bank Guarantee towards Bid Security as per Annexure – VII (Revised) only.**	

iii) Bids are invited under "Single Stage Two Bid System". Bidders have to submit both the "Techno-commercial Unpriced Bids" and "Priced Bids" through electronic form in the OIL's e-Tender portal within the bid Closing date and time stipulated in the e-tender. The Techno-commercial Unpriced bid is to be submitted as per scope of works and Technical specification of the tender and the priced bid as per the online Commercial bid format. For details of submission procedure, please refer relevant para of General Terms and Conditions vide MM/LOCAL/E-01/2005 for E-Procurement LCB Tenders. Any offer not complying with the above shall be rejected straightway.

iv) Performance Security:

Successful bidder will be required to furnish a Performance Security @10% of the order value. The Performance Security must be valid for 12 months from the date of commissioning or 18 months from the date of despatch whichever concludes earlier. Bidder must confirm the same in their bid. Offers not complying with this clause will be rejected.

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The validity requirement of Performance Security is assuming despatch within stipulated delivery period and confirmation to all terms and conditions of order. In case of any delay in despatch or non-confirmation to all terms and conditions of order, validity of the Performance Security is to be extended suitably as advised by OIL.

v) The Bank Guarantee should be allowed to be encashed at all branches within India.

vi) The prices offered will have to be firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price will be treated as non-responsive and rejected.

vii) Bids received after the bid closing date and time will be rejected. Similarly, modifications to bids received after the bid closing date & time will not be considered.

viii) All the Bids must be Digitally Signed using "Class 3" digital certificate with Organisation's name *(e-commerce application)* as per Indian IT Act obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. The bid signed using other than "Class 3 with Organisation's Name" digital certificate, will be rejected.

ix) Technical RFx Response folder is meant for Technical bid only. Therefore, No price should be given in Technical RFx Response folder, otherwise the offer will be rejected.

x) Price should be maintained in the "online price schedule" only. The price submitted other than the "online price schedule" shall not be considered.

xi). Integrity Pact :

OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure DDD of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be submitted by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.

xii). A bid shall be rejected straightway if it does not conform to any one of the following clauses:
(a) Validity of bid shorter than the validity indicated in the Tender.
(b) Original Bid Security not received within the stipulated date & time mentioned in the Tender.
(c) Bid Security with (i) Validity shorter than the validity indicated in Tender and/or (ii) Bid Security amount lesser than the amount indicated in the Tender.
(d) In case the Party refuses to sign Integrity Pact.
(e) Average Annual Turnover of a bidder lower than the average Annual turnover mentioned in the Tender.

2.0 BID EVALUATION CRITERIA (BEC)

The bids conforming to the terms and conditions stipulated in the tender and considered to be responsive after subjecting to the Bid Rejection Criteria as well as verification of original of any or all documents/ documentary evidences pertaining to BRC, will be considered for further evaluation as per the Bid Evaluation Criteria given below.

A) TECHNICAL:
1. The manufactured product should be strictly as per OIL's tender specification.

B) COMMERCIAL:

i). To evaluate the inter-se-ranking of the offers, Assam Entry Tax on purchase value will be loaded as per prevailing Govt. of Assam guidelines as applicable on bid closing date. Bidders may check this with the appropriate authority while submitting their offer.

ii) Priced bids of only those bidders will be opened whose offers are found technically acceptable. The technically acceptable bidders will be informed before opening of the "priced bid".

iii). To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by the company, failing which the offer will be

summarily rejected.	

NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

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ANNEXURE-IA

TECHNICAL SPECIFICATIONS WITH QUANTITY

Tender No & Date: SDI0044P16 DT: 27.01.2016

	Complied / Not Complied. (Remarks if any)
ITEM NO. 10 **SUPPLY OF 16 NOS 11 KV INDOOR TYPE SWITCHGEAR PANEL(6 NOS INCOMER FEEDERS, 7 NOS OUTGOING FEEDERS, 1NO BUS COUPLER AND 2 NOS BUS PT, BUS CT CUM BUS ADAPTER PANELS).** **(ALL 16 NOS SWITCHGEAR PANEL TO BE CONSIDERED AS ONE UNIT AND PRICE TO BE QUOTED ACCORDINGLY)** A. Background Information: The existing Southern Switchgear make 18 nos 11 KV panels (16 nos Bulk Oil Circuit Breakers with additional 2 nos Bus PT, Bus CT cum Bus Adapter Panels) were installed, along with the Waste Heat Recovery Project at Duliajan Power Station in the year 1984. The breakers were of vertical isolation type Bulk Oil Circuit Breakers (BOCB). Presently spare parts for these breakers & panels are not readily available and these have exhibited deterioration due to ageing. Moreover, the OEM of the panel & BOCB's namely M/s Southern Switchgear India have closed down and ceased to exist since nineties. The layout of the existing switchgear room is shown in the attached Annexure- V. The switchgear room is having underground RCC cast / brick walled cable cellar of depth 1.94 m and all incoming/ outgoing HT cable feeders are routed through this cable cellar. Presently it is proposed to replace the Southern Switchgear panels & breakers with new state of art horizontal separation & horizontal draw out type VCB panels. It is also proposed to relocate the incomers from 2 x 14.45 MW Gas Turbine Generators and some of the important 11 KV outgoing feeders from the existing Reyrolle Burn switchgear of Duliajan power Station to the proposed new switchgear; as spare parts for these breakers & panels are not readily available and these also have exhibited deterioration due to ageing. Again the new switchgear is proposed to be interconnected by two feeders with 11 KV Switchgear of the 20 MW Gas Turbine for to & fro power transfer as required. B. Scope of Work: This Specification covers the design, engineering, manufacture of complete switchgear with all accessories as specified hereinafter at the manufacturer's factory, testing, painting, packing for transport, installation, commissioning & energisation of 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler with additional 2 nos Bus PT, Bus CT cum Bus Adapter Panels). Each Incomer/ Outgoing Feeders & Bus Coupler shall have 11 KV, 1250 A (31.5 KA Short circuit breaking capacity) VCBs, control, monitoring devices & protection relays. The switchgear shall be multi panel, Indoor Type having Vacuum Circuit Breakers with motor operated spring charge mechanism, electrical/ manually open/close operable & with shunt trip feature. The successful bidder has to dismantle the old switchgear, carryout civil modification jobs as required, supply new panel with VCBs & its accessories and carryout installation,	

commissioning & energisation of the same at site (as per clause 20: Dismantling of old 11 KV switchgear panels and Installation, Testing, Commissioning & Energisation of new 11 KV Switchgear panels).

C. Site Condition:
The switchgear panels shall be installed in a room without air conditioning but with ventilation to allow natural cooling. Therefore all the protection and control devices employed shall be capable of operating in this environment without failure for their designed life time. Particularly the power supply modules of the protection and control devices shall be designed for minimum heat generation and effective heat dissipation to ensure that the temperature of these devices enclosed in the relay panels at the below listed ambient temperatures shall not exceed the maximum operating temperature of the device.

The panel shall be designed to work under following adverse environmental conditions:
a) Maximum Ambient air temperature : 40 deg C
b) Minimum Ambient air temperature: 2.5 deg C
c) Maximum humidity at site (at 40 deg C): 98 %
d) Surrounding atmospheric condition : Humid
e) Site altitude: 150 mtr.

D. Technical Specification:

1.0 Supply of 11 KV VCB Panels shall be with the following specifications:

The panels shall be fully factory built and shipped in suitable sized pre assembled units to meet transportation requirements and finally to be assembled at site for installation.

The switchgear shall be of single bus bar design having two sections (Bus Section A & Bus Section B) and shall have one bus coupler breaker having bus synchronizing & dead bus closing provision.

The new 11 KV Switchgear Panel shall comprise of 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels). Each Incomer/ Outgoing Feeders & Bus Coupler shall have 11 KV, 1250 A (31.5 KA Short circuit breaking capacity) VCBs, control, monitoring devices & protection relays.

The switchgear shall have following panels:
a) 6 nos. 1250 A VCB Incomer Feeders,
b) 7 nos. 1250 A VCB Outgoings Feeders,
c) 1 no. 1250 A VCB Bus Coupler,
d) 1 no. Bus PT, Bus CT cum Bus Adapter Panel for Bus Section A
e) 1 no. Bus PT, Bus CT cum Bus Adapter Panel for Bus Section B

Proposed single line diagram (SLD) is shown in the attached Annexure- VI & proposed layout of the switchgear is shown in is shown in the attached Annexure- VII.

The name of the proposed panels shall be as follows:
a) Panel 1: Interconnection #1 to 20 MW GTG#3 Bus (1250A)
b) Panel 2: Feeder -1 (1250A)
c) Panel 3: Interconnection #1 to Old GT Bus (1250A)

d) Panel 4: Feeder -2 (1250A)
e) Panel 5: GTG #1 Incomer(1250A)
f) Panel 6: Feeder -3 (1250 A)
g) Panel 7: Bus PT, Bus CT cum Bus Adapter Panel for Bus Section A
h) Panel 8: Bus Coupler (1250A)
i) Panel 9: Bus PT, Bus CT cum Bus Adapter Panel for Bus Section B
j) Panel 10: Interconnection #2 to Old GT Bus (1250A)
k) Panel 11: Feeder -4 (1250A)
l) Panel 12: Feeder -5 (1250A)
m) Panel 13: Feeder -6 (1250 A)
n) Panel 14: Feeder -7 (1250 A)
o) Panel 15: GTG #2 Incomer(1250A)
p) Panel 16: Interconnection #2 to 20 MW GTG #3 Bus (1250A)

The panels, VCBs shall be Designed, manufactured and tested in accordance with IS-13118:2002, IS-14658:2000, IS-2071 Part 1,2 & 3: 1993, IS-3427: 1997, IS-IEC-62271-201-2006, IS 12729:2004 (IEC 60694:2002), IEC 61850 and shall be in compliances with any other relevant latest Indian Standard specifications, Indian Electricity Acts and National Electric Code in force. The bidder shall specifically state the precise standard, complete with identification number, to which the various equipment and materials are manufactured and tested.
The manufacturer of offered panels shall have type test certificate for their designed, manufactured and supplied 11 kV Panels, 1250 A VCBs, CTs, PTs from CPRI or any other test house accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL) India. The bidder shall submit along with the bid, copies of Type test certificates for offered type of Panel, VCBs, CTs & PTs etc.

2.0 PANEL CONSTRUCTION: The panel construction shall be as described below:

a) Enclosure Type: Dead front, floor- standing, rigid welded steel frames fully compartmentalized, Metal clad, Vermin Proof, suitable for indoor installation and provision for bolting/ grouting to the floor.

b) Enclosure degree of protection: Degree of protection shall be Minimum IP 3XD or 4X for all High and low Voltage compartments.

c) Enclosure material shall be CRCA steel.

d) Load bearing members shall be minimum 2.5 mm thick.

e) Doors, internal partitions and side covers shall be minimum 2.0 mm thick.

f) Top covers & Bottom covers shall be minimum 2.5 mm thick.

g) The sheet metal should be given seven tanks anti corrosion treatment & then powder coated. Panel manufacturer must have powder coating facilities for painting of panels.

h) Colour of the panels shall be powder coating Pabble grey to shade RAL7032 on inside & outside surfaces. Bus Bar & Feeder shutters shall be painted in Red and marked with yellow letters.

i) The new panels shall be so arranged in the existing room that there shall be at least 1 m gap from both side walls and backside and at least 2 m gap at the front side.

j) Height of Panel: Maximum panel height shall be 2700mm, however all control & protection devices shall not be at height more than 2300mm.

k) Width of Panel: Maximum individual panel width shall be 700 mm, this is required to facilitate 16 nos main breaker panels in the existing switchgear room; as the room has space constraints.

l) Extensibility of compartments shall be on either end sides of the switchgear.

m) Breaker compartment door: Design with breaker trolley as the front cover shall not be acceptable. Breaker compartment door shall be of front open type. Three nos. of bright steel hinges shall be used on door with door opening limited to 110 Degree (approx). Doors shall be easily removable for maintenance and each door shall be provided with lockable handle.

n) Separation of Breaker to bus bar & cable compartment shall be through seal off bushings.

o) Each cubicle/ compartment shall be separated from adjacent one by sheet steel barrier. However the bus section of each panel shall be separated by epoxy reinforced fibre glass insulating barrier or equivalent.

p) Each panel shall be self contained i.e if any of the side panel is removed, it will not affect the remaining panels.

q) Exposure to live parts: In case the VCB breaker panel door is required to be opened during any contingency, the personnel should not be exposed to any live parts. Breaker front side with the operating mechanism should have suitable shrouds / barriers / insulating sleeves as required preventing exposure to high voltage live parts.

r) Self operating shutters for shielding live fixed contacts of bus & feeder side shall be provided; which will close automatically when VCB truck is withdrawn to test position.

s) Bus support insulator: Non hygroscopic, track-resistant, high strength, epoxy insulators (calculation for validating dynamic force withstand capability to be submitted during detailed engineering).

t) Fixing arrangement for doors & covers: All doors & covers shall be concealed hinged bolted with SS bolts. Suitable gaskets & washers shall be provided on all joints.

u) Panel Base Frame: Steel base frame as per manufacturer's standard shall be supplied along with the panels.

v) Removable bolted covers for cable chamber and bus bar chamber shall be provided with C type handles.

w) Prevention of Internal Arc: Panel shall be type tested against internal arc as per provision in IEC 62271- 201: 2006 Annexure A. The Bus bars/ Breaker/ Cable and CT chambers shall be provided with arc venting outlet/ Pressure relief devices on the top of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel. The doors of

the compartment shall be capable of withstanding the effects of maximum internal arcing fault without being blown off and causing danger to personnel and other equipment. Supporting documents of type test as per relevant IEC standard to this effect shall be provided along with the offer.

x) All nut & bolts used in the panel should be of high tensile, bright zinc plated, hexagonal headed, metric size, manufacture to DIN 931 from 8.8 grade of steel, minimum tensile strength shall be 80kgf/SQ.MM. The nut & bolts threads shall be of coarse type and shall be fitted with bright zinc plated flat and spring washers (two nos each.

y) Proper sized lifting hooks shall be provided for handling of the panels.

z) The panel shall be provided with 2 nos 80 W space heaters in each cubicle. Heater circuits of each panel shall be provided with ON/OFF switch and protected by suitable rated HRC fuses. Adjustable thermostats (for auto on/off) of suitable rating shall be provided to control the cubicle temperature.

3.0 CUBICLES AND PANEL DETAILS: The switchgear panel shall comprise of separate compartments for the followings:
a) Bus bar compartment,
b) Circuit Breaker Compartment,
c) HV incoming/ outgoing Feeder Protection & Metering CTs compartment,
d) HV incoming/ outgoing Cable Terminal box,
e) HV incoming/ outgoing feeder PT compartment,
f) Bus PT compartment with Bus CTs ,
g) Control, Protection & metering compartment (LT compartment).

The detailed specifications of the above compartments are given below:

a) Bus Bar Compartment:
(i) The panel shall be designed for 11KV, 3 phase 50 HZ operation with simplex three phase copper bus bar with current rating of 1600 Amp and suitable for short circuit capacity 31.5 KA for 3 second.

(ii) Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Busbar current rating-1600 Amp. Fault current rating-31.5 kA for 3 sec.

(iii) Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on busbar, its risers. Thickness of bus bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or equivalent. Bus bar interconnection bolts & HT cable terminal connections shall be first wrap with black mastic compound or equivalent and then covered with Heat shrinkable insulation tape of 11KV voltage grade.
(iv) Bus bar arrangement should be such that in future if required, similar cubicles can be connected to its both side end cubicles.

(v) Cast epoxy insulator supports shall be provided for bus bar and shall be designed to withstand full short circuit current at specified fault level for 3 seconds.

(vi) Risers & connections and shall be marked in different conventional colour codes for identification of three different phases (R, Y, B).

b) Circuit Breaker Compartment: The circuit breakers shall be mounted on horizontal draw out truck. The circuit breaker truck should have vacuum interrupting device with horizontal isolation system. Detailed requirements of VCBs is given in the section 3.0.

(i) Breaker rack-in/ rack-out, spring charge and breaker open / close operation should be able to carry out with suitable mechanism, having the breaker cubicle door in closed position.

(ii) Mechanical type interlock shall be provided so that during normal operation, breaker compartment door cannot be open; unless breaker is racked out to test/ isolated position. However for maintenance, same can be easily disabled if required.

(iii) Breaker compartment door closing should be possible when breaker is in isolated or service position.

(iv) The front door shall have view glass to facilitate observation of mechanical ON/OFF indication, spring charge/discharge and operation counter etc. The glass shall have sufficient toughness to withstand internal arc pressure as per IEC 62271- 201: 2006.

(v) Each breaker compartment shall have three positions namely Service position, Test/ Isolated position and Withdrawal position. All positions shall be properly marked and shall be visible from outside with the front cover in closed condition.

c) HV incoming/ outgoing Feeder Protection & Metering CTs compartment:
(i) Feeder CT compartment shall be provided on all incomer/ outgoing feeder panel to facilitate installation of protection & metering of CTs.
(ii) The feeder CT and the cable compartment shall be in the rear with bottom cable entry provision.
(iii) The LT control cables from CTs shall terminate in a separate box. From this terminal box, LT control cables shall be drawn to the front Relay & metering compartment through a detachable metallic conduit (pipe or rectangular); so as to have isolation from high voltage terminals.

d) HV incoming/ outgoing Cable Terminal box:

(i) The cable termination shall be located at least 250 mm from the CT primary terminals for easy in maintenance.

(ii) HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided at the rear bottom side of the panel.

(iii) Each cable termination to be connected to termination links with minimum two sets of suitable nuts, bolts and spring washers.

(iv) For HV cable termination in the cable compartment minimum height of 750mm shall be maintained to accommodate the heat shrinkable type indoor cable termination.

(v) Gland Plate (detachable type): All the cable entry plates shall have removable gland plates. Gland plates shall be of 3.0mm thick MS detachable type for 3 core cable and aluminium 5.0mm for single core cables. Cable compartment shall have an anti vermin guard plate for protection against entry by insects, rodents etc.

(vi) Cast epoxy insulator supports shall be provided for cable termination links and shall be designed to withstand full short circuit current at specified fault level for 3 seconds.

(vii) Incomer feeder cable boxes should be of suitable sized for safe entry of two nos per phase single core cables of size 400 sq mm of Cu conductor 11kV grade, XLPE insulated, PVC sheathed, Armoured cable.

(viii) Outgoing feeder cable boxes should be of suitable sized for safe entry of one/ two nos per phase single core cables or 3 core cables of maximum sized 240sq. mm or 120 sq. mm of Cu conductor, 11kV grade, XLPE insulated, PVC sheathed, Armoured cables.

(ix) The cable termination arrangement should be such that it should be possible to disconnect/ isolate one cable in the event of fault in that cable and power-up the unit with the other cable.

(x) Suitable sized heavy duty double compression cable glands shall be provided for all the cable boxes. Cable glands shall be of Stainless steel & make Dowell/gland make/Jainson/Baliga.

(xi) Cable termination kit: Following HT Cable terminal kits shall be supplied along with the panels:

i. HT Cable Termination Kit, Indoor, 11kV, 1C x 400 sqmm, XLPE - 12 nos
ii. HT Cable Termination Kit, Indoor, 11kV, 3C x 240 sqmm, XLPE - 4 nos
iii. HT Cable Termination Kit, Indoor, 11kV, 3C x 120 sqmm, XLPE - 8 nos

All the cable termination kits shall be of Heat Shrinkable type and having the following features:
Voltage grade: 11,000 V AC,
Cable Type : Cross linked polyethylene (XLPE), Armoured,
Type of kit: Indoor,
Shelf life : Minimum 5 years,
Make: Raychem/Heat shrink/ Xicon.

The cable termination kit packages shall contain the following information/ documents: Make, Batch no., Date of manufacture, Date of expiry, Shelf life of the kit, Guarantee/Warrenty certificate, Installation manual.

e) HV incoming/ outgoing feeder PT compartment:

(i) All the Feeder PTs shall be of horizontally draw out type.
(ii) PTs shall be mounted on the top of the panel or shall be mounted on compartment below the VCB compartment.
(iii) Mounting of PT on the feeder breaker truck itself, shall not be acceptable (This is required to ensure whether the outgoing feeder is live or not; even when the breaker is not inside the panel. As per normal practice, the feeder PT will be withdrawn only when the feeder is not charged).
(iv) In case Feeder PT is mounted on the panel rear top, access to the PT must be available and the panel top cover reinforcement shall be sufficient for allowing a person to stand on the top.

(v) All the PTs shall be provided with metallic shutter mechanism to prevent exposure of live parts when the PT is taken out to withdrawal position. Shutter mechanism shall be such that in service position, the shutters does not touch PT's HT insulators.
(vi) Sealing arrangement shall be provided to keep the PT's HT insulators unexposed in service position.
(vii) PT service position locking mechanism shall be provided and same shall be indicated by bidder in relevant drawing.

f) Bus PT & Bus CT compartment:
(i) In each section of the bus bar; there shall be one PT.
(ii) Their location shall be on both sides of the bus coupler breaker; to monitor Bus voltages and to facilitate synchronization/ dead bus closing to deliver power from one section to the other.
(iii) All the Bus PTs shall be of horizontally drawout type.
(iv) Mounting of PT on the bus coupler breaker truck itself, shall not be acceptable.
(v) Bus PTs shall be mounted on the top of the panel or shall be mounted on compartment below the Bus trunking compartment.
(vi) Bus CT compartment: Bus CT compartment shall be provided on both sides of the bus coupler breaker panel to facilitate installation of Bus CTs (1 no each phase) for Main Bus Differential Protection and directional over current/ earth fault type secondary Bus Zone Protection system.

g) Control, Protection & metering compartment (LT compartment):

(i) The L.T. chamber of suitable height shall be positioned at the front, on the top of the VCB chamber & shall be isolated from the live HT parts.

(ii) The compartment shall be with door of front open type. Three nos. of bright steel hinges shall be used on front door with door opening limited to 110 Degree (approx) and each door shall be provided with lockable handle.

(iii) Protective relay, measuring equipments and auxiliary controls along with the switches and indications are to be accommodated in this L.T. compartment.

(iv) All devices in the LT box are to be marked with permanent labels.

(v) One no cubicle lamp (15 W CFL) shall be provided in each control & relay cubicle along with ON/OFF switch.

(vi) Panel rating plate shall be provided inside/outside the LT compartment.

(vii) All cables and wires shall be numbered with suitable ferrules.

(viii) Suitable lugs shall be used for control wiring and ring type lugs shall be used for all CT & PT wiring.

(ix) All wires shall terminate on suitable Terminal Blocks and all TBs shall have 10% spare terminals.

(x) Each terminal blocks shall be properly marked.

(xi) Metallic Reinforced flexible conduit shall be used for wiring of Control & Protection compartment to VCB auxiliary contact.

(xii) PVC spiral shall be provided on exposed wires near the door hinge in the LT box.

(xiii) Colour coding of control cables shall be followed as required by ISI. Control cables shall be approved by IS-694.

(xiv) LT control cable terminations shall be through bottom cover at the front of the panel.

(xv) The LT control cables shall be properly shielded with detachable metallic barrier to prevent damaged during internal flashover in the panel.

(xvi) One multi-core LT cable termination box shall be provided at the Bus Coupler panel, for external 125V DC supply from DCDB and external 230V AC supply from ACDB,

(xvii) In Generator Incomer Panel provision shall be kept for inter trip of Generator Incomer VCB from upstream Generator protection circuit, Also breaker auxiliary contacts shall be configured for giving status of Generator Incomer On/Off status to Generator protection circuit. Remote indication of income/ outgoing voltages, currents, power etc.

(xviii) In each incomer & outgoing Feeder Panels & bus coupler panel, facilities shall be kept for local electrical close operation with synchro check/ Dead bus or feeder close permissive, local/ remote selector switch, local open, local indication for open/ close/ auto trip conditions, local indication for spring charged, local indication for trip circuit healthy status, local indication of income/ outgoing voltages, currents, power etc, local indication for trip condition etc.

(xix) In each income & outgoing Feeder Panel & bus coupler panel, future provision shall be kept for remote electrical close operation with synchro check / Dead bus or feeder close permissive facility, remote open, remote indication for open/ close/auto trip conditions, remote indication for spring charged and remote indication for trip circuit healthy status, status of local/ remote switch, Remote indication of income/ outgoing voltages, currents, power etc. Remote Annunciation for trip condition, Breaker spare auxiliary contacts etc.

(xx) Main components of Control, Protection & metering compartment shall be as follows:

1) Ammeter
2) Voltmeter
3) Energy Meter
4) Indication Lamps
5) Selector switches and push buttons
6) Internal Wiring
7) Ferrules & Ferrules Marking
8) Cable Lugs
9) Terminal Blocks (TBs)

1) Ammeter:

i. Ammeter to be Flush Mounted, back connected, dust proof with Industrial grade A classification and conforming to IS:1248(1968)

ii. Ammeter to be Digital, 3 ½ -digit single line or 3 line display.

iii. Ammeter Control power supply voltage to be 110V DC.

iv. Size: Suitable size
v. Ammeter range shall be programmable as per CT ratio.
vi. If the Ammeter is single line display then, 1 no Ammeter selector switch to be provided for measuring load currents of all the three phases.
vii. Panels where Ammeter to be provided: All the panels except for Bus coupler
viii. Accuracy class: 0.5
ix. Ammeter Make shall be of Siemens/L&T/ Merlin-Gerin/ Schneider Electric, HPL, Indoasian/ Same as the maker of the VCB.

2) Voltmeter:

i. Voltmeter to be Flush Mounted, back connected, dust proof with Industrial grade A classification and conforming to IS:1248(1968)
ii. Voltmeter: Digital, 3 ½ -digit 3 line display.
iii. Voltmeter range shall be programmable as per PT ratio.
iv. Voltmeter control power supply voltage to be 110V DC.
v. Size: Suitable size
vi. Voltmeter shall display line to line & line to neutral voltages of all the three phases of incomers/ outgoing feeders or bus sections.
vii. Panels where voltmeter to be provided: Incomers/ Outgoing feeders, Bus PT A & Bus PT B panel.
viii. Voltmeter of Incoming/ Outgoing panels shall be connected directly from respective feeder side PT secondary of associated unit.
ix. Voltmeter of Bus PT panels shall be connected directly from respective bus section PT secondary.
x. Accuracy class: 0.5
xi. Voltmeter make shall be of Siemens/L&T/ Merlin-Gerin/ Schneider Electric, HPL, Indoasian/ Same as the maker of the VCB.

3) Energy meter:

i. Panels where energy meter to be provided: All Incoming/ Outgoing panels except bus coupler and bus PTs.

ii. Each energy meters shall be of 3ph, 3 wire CT/PT operated, Microprocessor based digital multifunction TRIVECTOR energy meter with accuracy class 0.5.

iii. All the Energy meter should have RS485 port with MODBUS protocol for data logging/ downloading and Auto Meter Reader (AMR) compatible.

iv. The meter shall be of size approximately 96 mm x 96 mm.

v. Energy meter should measure the following electrical parameters: Frequency, V, A, PF, KVA, KVAr, KWH, and KVAr, Cumulative On Hours, Cumulative Off Hours, Active Import Energy kWh(I), Active Export Energy kWh(F), Max of day Active & Reactive Power etc.

vi. The energy meters shall have RS-232/485/ MODBUS communication facility to connect in a network so that running & cumulative parameters can be monitored online from remote control room.

vii. Energy meter make shall be of L&T/ Merlin-Gerin/ Secure Meters (Swift Elite or

eWatch 1000) / Schneider Power logic PM200 series/ HPL -Socomec (Diris A41)/ Siemens PAC3200 / Same as the maker of the VCB.

4) Indication Lamps: Each VBC panel shall be provided with High intensity, clustered LED, flush mounted, insulated from 110V DC supply with appropriate coloured lens. The lens shall be made of a material, which will not be softened by the heat from the lamps. The LEDs shall be of industrial type.

Indication lamps make shall be of make -Binay/ Siemens/ Tecnic / L&T / Merlin-Gerin/ Same as the maker of the VCB.

Following indication lamps with colour of the LED lamps shall be provided on front panel of each VCB control cubicle:

i. Breaker ON: Red
ii. Breaker Off: Green
iii. Spring Charged: Blue
iv. Auto trip: Amber
v. Service position: White
vi. Test position: Green
vii. Breaker Ready to Close Permissive: Blue
viii. Feeder/ Bus R Phase Voltage Available: Red
ix. Feeder/ Bus Y Phase Voltage Available: Yellow
x. Feeder/ Bus B Phase Voltage Available: Blue
xi. Trip circuit healthy: White

5) Selector switches and push buttons: Selector switches and push button to be flush mounted on LV compartment door, with shrouded terminals.

i. TNC Switches shall be of pistol grip type. It should be of spring return to normal position. It should be lockable having mechanical interlock to prevent accidental operation of the switch.

ii. TNC switch terminals shall be screw & nut type and indelibly marked. At least 2 nos contacts for Close and 2 nos contacts for Open should be available.

iii. Local / Remote selector switch: 6 Pole 2 way lockable and stay put type.

iv. Rotary ON/Off switches: For heater / illumination circuit to be of rating minimum 16 A.

v. Push button for Relay Reset: For numerical relay reset push button shall be programmed to specified DI contact of the relay and for electro-magnetic type relays, it shall be manual flag reset type.

vi. Each breaker cubicle shall be provided with an Emergency trip push button (mechanical interlock type). The emergency push button shall be provided on front panel of the VCB to trip the breaker in case of emergencies; without opening the front cover. The Emergency trip push button shall be Red in colour and shall be protected with flaps or other suitable arrangement to prevent unintended tripping.

vii. Selector switches and push buttons make shall be of make - Siemens/ Tecnc/ L&T / Binay/ Merlin-Gerin)/ Same as the maker of the VCB.

6) Internal Wiring:

i. Internal wiring: 1100V grade PVC insulated stranded flexible copper wire.

ii. Control wiring and CT wiring shall be done using single core, PVC insulated FRLS (Fire Resistant Low Smoke) stranded copper cable of 1100V grade.

iii. Minimum cable size shall be 2.5 sq. mm for CT & PT circuit, and 1.5 sq. mm for control circuit, 4.0 sq. mm for Main, AC & DC Bus wirings.

iv. A suitable wiring duct system firmly, fixed on the panel and having metallic covers shall be installed for front to rear and inter panel wiring to provide easy access for inspection and replacement of the wires. It shall have sufficient clearance from High voltage system.

v. For wirings inside the relay & control panel moulded Plastic channels with covers shall be used and wires shall be suitably bunched and adequately supported to prevent sagging.

vi. Wiring between terminals of the various devices shall be point to point. Splices or tee connection will not be acceptable.

vii. Facilities for short-circuiting the current transformer secondary while the switchgear is in service shall be provided.

viii. Spare contacts of relays, breaker auxiliary contacts, CT tapings, PT tapings etc shall be wired up to the terminal blocks in the front control panel.

ix. Inter panel wiring during shipment: Inter panel wiring with ferrule to be terminated in the adjacent shipping section and shall be supplied with one end terminated and the other end bunched and coiled.

x. Phase arrangement shall be: As per relevant standard.

xi. Wiring Colour code shall be as follow:

a. PT Secondary: R ph - Red, Y Ph - Yellow, B Ph - Blue, Neutral - Black

b. CT Secondary: R ph - Red, Y Ph - Yellow, B Ph - Blue, Neutral - Black

c. Other Control & power cables: DC - Grey, AC-Black, Earth - Green

7) Ferrules & Ferrule marking: At both ends of wire with proper sized ferrule marking to be available. Ferrule type to be interlocked type. One additional red colour ferrule to be provided for all wires in trip circuit.

Following marking conventions to be followed as per requirement.

i. AC Circuit: H1,H2,H3 ...

ii. Metering Circuit: D11,D31,D51 ...

iii. O/C and E/F protection circuit : C11,C31,C51 ...

iv. REF/Differential protection circuit: A11,A31,A51 ...

v. Main DC distribution circuit: J1,J2,J3 ...

vi. Control and protection circuit: K1,K2,K3 ...

vii. Indication and annunciation circuit: L1,L2,L3 ...

viii. Motor circuit: M1,M2,M3 ...

ix. PT circuit: E11,E31,E51 ...

x. Spare contact circuit: U1,U2,U3 ...

8) Cable Lugs: All LT/HT cable lugs of suitable sizes shall be provided along with the panel.

i. Lugs to be used for LT cables shall be of Tinned copper, pre-insulated, fork type or ring type as applicable and as per cable size required.

ii. Lugs to be used for HT cables shall be of Tinned copper ring type as per cable size required.

9) Terminal Blocks (TBs): Shall be designed for 1000V grade and minimum current rating of 10 amps. It shall be of screw type suitable for 2 nos. leads. TB shrouds & separators shall be

of moulded non-inflammable plastic material.

i. Terminal bocks for CT & PT secondary shall be with provision for shorting CT circuits under live system condition with screw driver operated sliding link.

ii. Isolation links shall be provided on the trip circuits, closing circuit, protection trip circuit, alarm circuit and on the PT circuits to allow easy isolation without disconnecting the wires from TBs.

iii. At least 25% spare terminals shall be provided on in each TB rows.

iv. Terminal block Clearance shall be maintained as follows:

a. Clearance between 2 sets of TB: 100 mm minimum.

b. Clearance with cable gland plate: 250 mm minimum.

c. Clearance between AC / DC set of TB: 100 mm minimum.

4.0 CIRCUIT BREAKER DETAILS:

Circuit Breaker shall be mounted on withdraw able truck/trolley or carriage, with locking facility in service & test positions. Racking-in and Racking-out should be such that one person can do it easily.

All the VCBs for incomer, outgoing & bus coupler panels shall be of following specifications:

a) 11kV, Three pole, 1250 A continuous rating VCB designed for with 31.5 kA for 3 sec fault level.

b) VCB shall be Horizontal draw out type with Horizontal Isolation mounted on trolley with rollers.

c) Trolley/ Truck : The circuit breaker shall be mounted on an inbuilt carriage to facilitate isolation and withdrawal of the breaker. The VCB shall be either floor mounted foot roller mounted trolley type or roller mounted on sliding carriage type.

If the breaker carriage is sliding type in the compartment and does not allow to complete withdrawal of the breaker outside it's compartment, then a purposely built trolley shall be provided, which should be equipped with a lowering/ raising mechanism to lower the Circuit breaker to the floor and vice versa. This operation should be capable of easily carried out by one or two person and this shall be demonstrated during FAT (if applicable). If required, one such trolley for each breaker type shall be included in the offer.

d) VCB trolley front cover shall be provided with two handles and cover shall be fixed to truck frame with minimum four bolts.

e) VCB trolley earthing shall be with self aligning flower contact.

f) VCB's fixed and moving contact insulators shall be epoxy cast resin type and suitable for ambient conditions mentioned in para C (Site Conditions).

g) Each breaker shall be fitted with three separate, identical single pole Vacuum bottle units and Vacuum bottles shall be fully interchangeable between the phases both electrically and mechanically.

h) All VCB live parts to be enclosed in epoxy resin moulds or suitable insulated partitions shall be provide between the poles & between side poles and metallic panel/ VCB enclosure.

i) VCB fixed & moving contact Bushings shall have suitable current rated silver coated self aligning flower contacts for firm connection.

j) Three separate identical single pole Vacuum bottle units shall be operated through a common or individually insulated shaft, which in turn shall be driven by the breaker operating mechanism.

k) Each breaker shall have provision for manually as well as electrically operated spring charging, closing and tripping.
l) Breaker mechanism shall be of spring charged, latched stored energy type with manual & motor operated automatic spring charging system.
m) Spring charge motor shall be of universal type of suitable power rating designed for 110 V DC.
n) One manual/ electrically operated O-C-O operation must be possible after failure of power supply to the spring charging motor.
o) Breaker operating mechanism shall be provided with electrical anti-pumping feature for closing.
p) Breaker auxiliary contacts shall have minimum 6 NO + 6NC contacts.
q) Each breaker shall be provided with operation counter of 5 digits, mounted on front side of the trolley and shall be clearly visible through looking glass of the front panel cover.
r) Breaker shall be designed for high mechanical endurance of 50,000 (minimum) operations.
s) Each breaker shall be provided with manual on/ off push buttons.
t) Mechanical type ON/OFF indication shall be provided on front side of the trolley and shall be clearly visible through looking glass of the front panel cover.
u) Mechanical type spring free/ charged indication shall be provided on front side of the trolley and shall be clearly visible through looking glass of the front panel cover.
v) Breaker positions indicator shall be provided with Service, Test/ Isolated and Withdrawal position marked.
w) Breaker least operating sequence shall be O -0.3 sec - CO - 3 min - CO.
x) Breaker Trip and Closing Coil: Shall be rated for operation with 110 V substation DC voltage. The breaker shall be designed for operation at minimum operating voltage of 70% for tripping and 85% for closing. Burden for Trip and Closing Coil shall be less than 200 watt for each coil.
y) Insulation level: Breaker shall be rated for
(i) Rated insulation level at power frequency:28KV
(ii) Peak withstand voltage:75 kV
z) Short time withstand current(3s): 31.5 kA
aa) Rated breaking capacity: 31.5 kA (rms)
bb) Rated making capacity: 78.75 kA (peak)
cc) VCB shall be of low maintenance type & VCB poles shall be replaceable at site by skilled technicians.
dd) Inter changeability: There shall be possible of interchange ability of VCBs, only with breaker of same rating
ee) Handle: At least four hand operating device for manual charging & four handle for breaker rack in- rack out operation shall be supplied with the switchgear assembly.
ff) Make of the VCBs shall be Schneider / ABB/ Siemens / Crompton Greaves/ AREVA/ L&T.

4.1 Breaker Mechanical Safety interlocks shall be provided as follows:
a) Not possible for circuit breaker to be either racked in-out from and to the service position unless its main contacts and auxiliary contacts are safely open.
b) Not possible to racking in the circuit breaker until its control plug is fully engaged.
c) Not possible for circuit breaker to be withdrawn from the panel, unless it is at the withdrawal position.
d) Disconnection of control plug shall be inhibited as long as the breaker is in service position.
e) Not possible for circuit breaker to be switched ON when the breaker is in any position

between test and service.
f) The circuit breaker racking equipment should have pad lockable provision in service & test positions.

4.2 Breaker Electrical Safety interlocks shall be provided as follows:

a) Electrical close/trip operation should be dependent on Local/ Remote switch. However, protection trip and emergency trip circuit should be independent of Local/ Remote Switch.

b) In Local: Breaker should be operable in either Service or Test position

c) In Remote: Provision shall be kept for operation of breaker in Remote selection only when the breaker is in Service Position.

d) Closing from Local: Breaker should be closed only when Local/Remote selector switch is in Local position, breaker is ready to close and Local TNC is selected to close position.

e) Closing from Remote: Provision shall be kept for closing from remote, only when the Local/ Remote selector switch is in remote position and Remote TNC is selected to close position.

f) Tripping from Local: Breaker should be tripped only when local/remote selector switch is in local position and local TNC is selected to trip position.

g) Tripping from Remote: Provision shall be kept for trip from remote, only when the Local/Remote selector switch in remote position and Remote TNC is selected to trip position. (Presently remote panel is not in the scope, but provision shall be kept for remote control option).

h) Breaker "Ready to Close Permissive" shall appear only when breaker is in test/ service position, spring is charged, no trip in Master protection relay and trip circuit is healthy.

i) Testing of breaker: Shall be permitted only in Test or isolated position keeping control plug connected and breaker selected in Local condition.

j) Protection Master Trip Relay (NO) Contact: Shall be wired directly to trip coil.

k) Protection Master trip relay (NC) contact: Shall be wired to inhibit closing of breaker.

l) Trip coil supervision: Continuous monitoring of Trip coil supervision to be given for breaker close as well as open condition in service & test position.

m) Each breaker panel shall have trip circuit healthy indication.

5.0 Current Transformers Details:

a) CT required for metering and protection shall be as per IS-2705 & IS 4201 and shall be of adequate size and its insulation will be of epoxy cast resin type insulation class of E or better.
b) Type test certificate for each type of current transformers shall be submitted along with the bid.
c) Contact tips on primary side shall be silver plated.

d) Correct polarity shall be invariably marked on each primary and secondary terminal.
e) CT primary shall be wound or bar type, rigid, high conductivity grade copper conductor.
f) Unavoidable joints on the primary side shall be bolted type, preferably lap type.
g) Primary Current density at any point shall not exceed 1.6 A/sq.mm.
h) Suitable insulated copper wire of electrolytic grade shall be used for CT secondary winding.
i) Multi ratio in CT shall be achieved by reconnection of secondary winding tappings.
j) Secondary terminal studs shall be provided with at least three nuts, two plain and two spring washers for fixing of leads.
k) All studs, nuts and washers shall be of brass & duly nickel plated.
l) The minimum outside diameter of the studs shall be 6 mm. the length of at least 15 mm shall be available on the studs for inserting the leads.
m) The space clearance between nuts on adjacent studs when fitted shall be at least 10 mm.
n) All the CTs shall be of same make.
o) Make of the CTs shall be Kappa/ Automatic Electricals Ltd/ Precise Electricals/ Intrans Electro Components Pvt Ltd/ Pragati Electricals/ Same as the maker of the VCB.

p) Feeder wise CT current ratios & accuracy classes shall be as follows:

(i) For Incomer Feeder Panel No 1, 3, 10 & 16 and outgoing feeder panel 6, 13 & 14:
1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 1200-600/5-5 A, Short time withstand current(3s): 31.5 kA

i. Core - 1: Metering CT 15VA, Class-1.0,
ii. Core - 2: Feeder Protection CT 15VA, Class-5P10, Accuracy Class: 0.5 suitable for over current & earth fault relay.

2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A, Short time withstand current(3s): 31.5 kA

i. Core - 1: Bus Differential Protection CT 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.
ii. Core - 2: Spare Bus Differential Protection CT 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.

(ii) For outgoing feeder panel 2, 4, 11, 12:

1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 600-300/5-5 A, Short time withstand current(3s): 31.5 kA.
i. Core - 1: For Metering, 15VA, Class-1.0,
ii. Core - 2: For Feeder Protection, 15VA, Class-5P10, Accuracy Class:0.5 suitable for over current & earth fault relay.

2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A Short time withstand current(3s): 31.5 kA
i. Core - 1: For Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.
ii. Core - 2: For spare Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.

(iii) For Generator Incomer Feeder Panel No 5 & 15:

1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 1200/5-5 A, Short time withstand current(3s): 31.5 kA

i. Core - 1: Metering CT 15VA, Class-1.0,
ii. Core - 2: Generator Differential Protection CT 15VA, Class-5P10, 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.

2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A, Short time withstand current(3s): 31.5 kA.

i. Core - 1: Bus Differential Protection CT 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.
ii. Core - 2: Spare Bus Differential Protection CT 15VA, Class-5P10, Accuracy class:0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.

(iv) For Bus CTs of Panel 7 & 9 (for Bus Section A & B respectively):
1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 1200/5-5 A, Short time withstand current(3s): 31.5 kA.
i. Core - 1: For Metering, 15VA, Class-1.0,
ii. Core - 2: For Feeder Protection, 15VA, Class-5P10, Accuracy Class: 0.5 suitable for over current & earth fault relay.

2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A Short time withstand current(3s): 31.5 kA.
i. Core - 1: For Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.

ii. Core - 2: For Spare Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.

6.0 Potential Transformer Details:
a) Each incoming/ outgoing feeder panels (panel no 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16) should be provided with 3 nos single phase PTs or 3 phase single unit type PT scheme.
b) Bus Section A & B (panel no 7 & 9) should be provided with Bus PTs each having 3 nos single phase PTs or 3 phase single unit type PT scheme.
c) All the PTs shall be of ratio 11kV (L-L) / 110V (L-L), burden - 100 VA, Accuracy class - 0.5 as per IS 3156 (Part I, II, III).
d) Type test certificate for each type of Voltage transformers shall be submitted along with the bid.
e) All the PTs shall be of same make and shall be of cast resin type with insulation class of E or better.
f) PT primary & secondary star point shall be connected to earth in service position and indicated by bidder in relevant drawing.
g) Contact tips of primary/secondary contacts shall be silver plated.
h) Correct polarity shall be distinctly marked on PT primary and secondary terminal.
i) Each PTs shall be provided HRC fuse on HT primary side & MCB/ fuses on secondary LT side. HT HRC fuses shall be of make GE, Siemens, L&T, Schneider, Cooper Bussman.
j) Secondary terminal studs shall be provided with at least three nuts, two plain and two spring washers for fixing leads.
k) The stud, nuts and washers shall be of brass, duly nickel plated.

l) The minimum outside diameter of the studs shall be 6 mm. the length of at least 15 mm shall be available on the studs for inserting the leads.
m) The space clearance between nuts on adjacent studs when fitted shall be at least 10 mm.
n) All the PTs shall be of same make.
o) Make of the PTs shall be Kappa/ Automatic Electricals Ltd/ Precise Electricals/ Intrans Electro Components Pvt Ltd/ Pragati Electricals/ Siemens/ L&T / Same as the maker of the VCB.

7.0 CONTROL SUPPLY:
a) The switchgear shall be designed to operate at 110 V DC. Control power supply for the new switchgear shall be provided from existing 110 V DC, 300 AmpHr battery bank with its dedicated float cum boost battery charger.

b) 110V DC Control supply and 230 V AC supply from OIL's source shall be supplied in the bus coupler panel only.

c) In bus coupler panel, AC & DC healthy indication should be available.

d) New switchgear should have properly insulated internal bus to carry DC & AC power to all other panels as required.

e) In each cubicle isolating fuses / MCBs shall be provided for incoming AC/ DC supplies.

f) In each cubicle isolating fuses with links shall be provided for breaker close, breaker trip, spring charge, protection trip and indication circuits.

8.0 EARTHING: Circuit Breaker and metal enclosure shall be earthed in accordance with latest IS published by BIS (IS-2516, part-1, section-1).

The switchgear cubicles shall be provided with minimum two proper sized earthing terminals (one at both ends) for connection to existing earth strips, connected to dedicated earth electrodes.

a) Material of Earthing Bus: An Earth bus rated to carry maximum fault current for 3 second shall be furnished along the full length of the panel board. The earth bus shall be of copper and shall have adequate cross sectional area. All bolted joints in the Earth bus will be secured by connection of minimum two nos zinc passivated nut bolts / stainless steel nuts & bolts with heavy duty flat and spring washers. Bolt dia shall be minimum 15mm.

b) Earthing Conductors: The earthing bus shall be connected to exiting earthing grid of the substation with two separate earthing conductors. Earthing conductors shall be of annealed high conductivity stranded Copper in accordance with Table-4 in BS.6346 and protected with an extruded PVC sheath of 1100 volt grade. The earthing conductor shall be adequate to carry the rated switchgear short-circuit current of 31.5kA for 3 second.

c) Connections to earthing bus:
Two separate earthing terminals shall be provided in each cubicle and shall be connected to the earth bus within the panel.
(i) All enclosure and non-current carrying part of the switchboard/components shall be effectively bonded to the earth bus.

(ii) All Hinged doors shall be effectively earthed through flexible copper braid.

(iii) Earthing connection between the VCB trolley/ carriage and cubicle shall be provided by means of proper sized, self aligning sliding contact. The VCB trolley/ carriage should be arranged in such a way that all the non current carrying metallic parts of the trolley are kept earthed in the isolated position as well as when the trolley is inserted from the isolated position to the service position. Similarly while the truck is being withdrawn, the earthing connection shall not be interrupted until the truck has moved past the isolated position. Also the VCB trolley/ carriage shall be earthed before control circuit contacts are plugged in the associated stationary contacts.

(iv) Metallic cases of relays, instruments and other LT panel mounted equipments shall be connected to the earth bus by independent copper wires of size not less than 2.5 sq mm with green colour insulation. For this purpose LT compartment should have a clear designated earth bus to which earth connections from all components are to be connected.

(v) CT & PT neutrals shall be earthed at the front panel terminal blocks through removable testing links.

9.0 Annunciation & Facia panel:

a) There shall be one Alarm Annunciation & Facia indication panel with hooter acknowledge and reset facility.

b) This shall raise alarm indication & hooter whenever any feeder trips on fault or other abnormal conditions arises such as PT fuse failure, Bus zone protection operated, Bus wire supervision fault, panel AC & DC control supply problem etc.

c) This Annunciation panel shall be located at the bus coupler panel or bus adapter panels.

10.0 Synchronoscope & two lamp method:

a) There shall be Synchronoscope & two dark lamp type check synchronizing system located at Bus coupler control panel or bus adapter panel.

b) PT circuits of all incomer & outgoing feeder, bus coupler shall be connected to one analogue or digital type synchronoscope (12 O'clock position type) & two dark lamp method type synchro check facility; to facilitate feeders to close for paralleling.

c) There shall be a selector switch to ON/OFF the synchronization scheme.

d) There shall be a selector switch so that only one feeder is selected at a time for synchronization with running bus.

e) Also in case of dead bus or dead feeder selection, provision shall be there to close the breaker in such case.

11.0 PROTECTION SCHEMES:

a) Protection CTs of each incomer/ outgoing feeder shall be residually connected to detect three phase over current & earth faults.

b) Bidder shall provide similar make relays only in all the panels.

c) Incommer/ Outgoing feeder Protection: Each incomer/ outgoing feeder panels (panel no. 1, 2, 3, 4, 6, 10, 11, 12, 13, 14, 16) shall have single numerical relay with following protections/ features:

(i) Definite-Time Non directional 3 phase Overcurrent Protection (50, 50(N)) (ii) Time- over current protection(51,51N) (programmable for IEC/ IEEE IDMTL curves) (iii) Overload protection(49) (iv) Under/Overvoltage protection from feeder PTs (27/59) (v) Under/Over frequency protection from feeder PTs (81 O/U) (vi) Breaker failure protection(50BF) (vii) Phase unbalance or negative sequence protection(46) (viii) Trip circuit supervision(74TC) (ix) Synchrocheck facility for paralleling of feeders with respective bus sections. (x) Fault recorder(25) (xi) Disturbance recorder(5) (xii) Events recorder(250) (xiii) Each numerical relays shall have RS-232/485/ MODBUS as per IEC 61850 communication facility to connect in a network so that running parameters, disturbance records can be monitored and relay settings can be changed online from remote control room. (xiv) Each numerical relay shall have minimum 16 programmable Digital input slots for monitoring breaker open/ close, breaker test/ service, breaker spring charge etc. and minimum 8 programmable Digital outputs for Breaker Ready To close, Trip circuit Healthy, Breaker Protection trip etc. (xv) Each numerical relay shall be suitable for relay auxiliary power of 110 V DC. (xvi) Successful bidder (supplier) shall supply all software necessary for monitoring/ configuration of the numerical relays. (xvii) Make: Make & type of numerical relays shall be of ABB (Type REB611/ Similar to REF615 or above)/ SEL (Type SEL-751 & SEL-311)/ Siemens(Type Siprotec 7SJ80 & 7SD80) / Areva T&D India Ltd (Schneider Group) (Type Micom- P123/ P127, Micom Alstom P40). d) Directional Bus Over current Backup Protection Relay: Bus PT, Bus CT cum Bus Adapter Panels 7 & 9 shall have two nos numerical relays with following protections/ features for providing back up Directional bus over current protection. These two relay should trip all the feeders in their respective sections (via Master trip relay circuit of individual panels) in the event of occurrence of bus fault condition. (i) Directional over current(67,67N) (to check bus fault on other section) (ii) Time -over current protection(50,50N,51,51N) (programmable for IEC/ IEEE IDMTL curves) (iii) Overload protection(49) (iv) Under/Overvoltage protection from Bus PT((27/59) (v) Under/Over frequency protection from Bus PT((81 O/U) (vi) Breaker failure protection(50BF) (vii) Phase unbalance or negative sequence protection(46) (viii) Trip circuit supervision(74TC) (ix) Synchrocheck facility for paralleling of bus section A & B (x) Fault recorder(25) (xi) Disturbance recorder(5) (xii) Events recorder(250) (xiii) Each numerical relays shall have RS-232/485/ MODBUS as per IEC 61850 communication facility to connect in a network so that running parameters, disturbance records can be monitored and relay settings can be changed online from remote control room. (xiv) Successful bidder (supplier) shall supply all software necessary for monitoring/ configuration of the numerical relays.	

(xv) Make: Make & type of numerical relays shall be of ABB (Type REB611/ Similar to REF615 or above)/ SEL (Type SEL-751 & SEL-311)/ Siemens(Type Siprotec 7SJ80 & 7SD80) / Areva T&D India Ltd (Schneider Group) (Type Micom- P123/ P127, Micom Alstom P40).

e) Bus Differential Protection:

(i) Circulating current based high impedance bus differential protection shall be provided on each section A & B.

(ii) All the panels of Bus Section A of the new switchgear shall be under Bus Section A differential protection and similarly all the panels of Bus Section B shall be under Bus Section B differential protection.

(iii) The zone of protection of A & B section shall overlap in the bus coupler panel.

(iv) Bus differential system In/Out selector switch shall be provided to facilitate bypass of the bus differential protection scheme for maintenance or other operational issues.

(v) Bus differential relay should trip all the feeders in their respective sections (via Master trip relay circuit of individual panels) in the event of occurrence of bus fault condition.

(vi) Suitable stabilizing resistor and Metrosils shall be provided with the bus differential protection scheme to mitigate CT dissimilarities and saturation during fault conditions.

(vii) Bus wire CT supervision relay shall be provided to monitor the healthiness of the Bus Differential Protections of each section.

(viii) In the event of unbalance in CT circuit during normal operation, same shall give an audible & flashing alarm.

(ix) Make: Make & type of relays shall be of as follows:

1) For Bus Differential Protection Relay: Make & type of numerical relays shall be of ABB (Type REB611/ Similar to REF615 or above)/ SEL (Type SEL-751 & SEL-311)/ Siemens(Type Siprotec 7SJ80 & 7SD80) / Areva T&D India Ltd (Schneider Group) (Type Micom- P123/ P127, Micom Alstom P40).

2) For Bus wire CT supervision Relay: Alstom (Type- MVTP), Areva type VTX31 or equivalent.

f) Master protection relay:
(i) There shall be one master trip protection relay in each incommer, outgoing and bus coupler panel.
(ii) This relay shall be of manually reset type.
(iii) Whenever the individual feeder protection relay operates due to fault on the feeder, the master trip relay of the respective panel should trip the breaker.
(iv) Similarly whenever bus zone protection of a particular zone operates due to fault, all the master protection relays of the panels of the affected zone should operate simultaneously and trip their respective breaker panels.
(v) Make: Make & type of relays shall be of Alstom High Speed Tripping Relay VAJH or equivalent

g) PT Fuse failure relay:
(i) Each Bus PTs & Feeder PTs shall be provided with fuse failure protection.
(ii) This scheme shall give alarm indication and raise hooter whenever PT primary or secondary fuse gets blown.
(iii) In such case; all the voltage based protections of the affected portion, shall be bypassed automatically.
(iv) The relay shall be separate one or inclusive in the Feeder protection numerical relay.
(v) Make: Make & type of relays shall be of Alstom Fuse Failure Relay VAPM31 or equivalent.

h) Control AC/ DC healthy check relay:
(i) There shall be one control 230V AC healthy check relay and one 110V DC healthy check relay located in the bus coupler panel to monitor panel AC & DC power healthiness.
(ii) This should give alarm indication as well as raise hooter; whenever the other supply is facing trouble.

i) Differential Protection of Generator Incommer Feeder: The proposed panel no 5 & 15 shall be used as Generator incomer from 2x 14.45 Mw Gas Turbines Unit#1 & #2 respectively. These two panels shall have provision for 3 phase generator differential CTs of rating 1200/5-5 A in each panel. Separate differential relays are not required as the existing Generator differential relays will be connected to these panels.

ITEM NO. 20

TERMS & CONDITIONS For DISMANTLING, ERECTION, TESTING, COMMISSIONING & ENERGISATION AT SITE –QTY – 01 AU

1.0 The successful bidder shall start to carryout dismantling, installation jobs within 30 days of material received at site.

2.0 All dismantling, installation and commissioning jobs shall be completed at the earliest and in no case shall exceed maximum 60 days.

3.0 The successful bidder shall submit to OIL detailed work plan for Dismantling, Installation & commissioning of the11 KV switchgear at least 30 days ahead of the proposed date.

4.0 Necessary shutdown arrangements for the panels shall be arrange by OIL.

5.0 Due to operational requirements, the dismantling of the old switchgear may have to be done in two phases. Accordingly arrangements may have to be made to remove de-energized old panels on one side of bus coupler, carryout installation of new panels on that side and after that, energise this section of the new switchgear. Similarly carry out jobs on the other section and finally complete new switchgear with bus coupler arrangement shall be commission.

6.0 The vendor shall carry out dismantling of the existing 11 KV switchgear after obtaining proper shutdown clearance from OIL only.

7.0 In the existing switchgear room, if any civil constructional modifications (floor cut outs for cable entry, floor levelling, grouting of panels or fixing of anchor fastener etc.) are required, same shall be carried out by the vendor after obtaining approval from CEE (G).

8.0 If removal of the old panels requires braking of side wall, same shall be done by the contractor after availing due permission from CEE (Gen). Again after installation of the new panels, reconstruction, painting of the wall shall be done by the vendor. However size of the existing switchgear room shall not be altered.

9.0 The panel will be placed inside the switchgear room by the party. After placement, all the panels shall be grouted or fixed by anchor fastener to the floor by the party.

10.0 All manpower, vehicles and any other facility required for storage, transfer & placement of panel inside the switchgear room will be arranged by the party at their own cost.

11.0 After placement inside the switchgear room, the panel will be checked for any defect / discrepancies in presence of OIL's engineer and rectification of the same will be done to by the party at their own cost.

12.0 The contractor shall carry out Installation, testing & commissioning of the new 11 KV panels & VCBs at the site, to the full satisfaction of OIL.

13.0 All installation, testing & commissioning shall be carried out in compliances with latest Indian Standard specifications and Indian Electricity Acts and National Electric Code in force.

14.0 All OIL's safety and local/ government regulations shall be followed during installation, testing and commissioning.

15.0 The contractor shall perform all works of installation, testing and commissioning under direct supervision of minimum one of his experienced supervisor possessing valid Electrical Supervisor's Certificate of Competency [with minimum parts 1, 2, 3, 4, 5a, 5b & 6] issued or recognized by State Electrical Licensing Board, Govt. of Assam. The supervisor must have experience of at least carrying out installation & commission of one 11 KV VCBs & panels Documentary evidence in this regard shall be submitted prior to execution of the jobs at site.

16.0 All electrical works shall be done by persons having valid Electrical Wireman Permits [with minimum parts 1 & 2] issued or recognized by State Electrical Licensing Board, Govt. of Assam. Documentary evidence in this regard shall be submitted prior to execution of the job at site.

17.0 All jobs shall be carried out under the direction of CEE (G), OIL or his authorized representative.

18.0 The job shall require continuous presence of the supplier or his authorized representative's for quality monitoring and co-ordination.

19.0 The supplier should provide authorized identity card/Photo Pass (duly attested by him) to all his workmen to be engaged for installation & commissioning of panels mentioning the PO No., their key nos, job role and area of operation.

20.0 The supplier shall provide PPEs to all his personnel and his employees shall wear PPEs while working during the installation & commissioning jobs.

21.0 All tools for installing and instruments for testing and commissioning shall be arranged/

provided by the contractor. The contractor must arranged/ provided the following tools:

a) 5 kV Digital Insulation Tester of reputed make,
b) Secondary current Injection Testing Set,
c) AC Primary current injection kit upto 2000 A range,
d) AC & DC High Pot Tester upto 28 KV range,
e) Discharge stick,
f) Digital multifunction meter,
g) Earth Tester with accessories,

22.0 The contractor shall be responsible for safe custody and proper storage of materials till handing over.

23.0 Any additional electrical items without which the job cannot be completed shall be provided by the contractor.

24.0 No temporary electrical wiring shall be done by the supplier during testing & commissioning without the permission of OIL's Engineer-in- Charge. Any power supply arrangements required for installation, testing & commissioning jobs; shall be provided by OIL at one point. The vendor shall draw the power through their own arrangement through Earth leakage Circuit Barkers of suitable ratings.

25.0 OIL will supply all H.T power cables.

26.0 During execution of jobs under this tender, no Accommodation, Transport, Fooding facilities etc. shall be provided to the Party by OIL.

27.0 Following should be minimum program for commissioning after complete erection-

27.1 General Checks

a) Physical inspection for damages and external defects.

b) Assembly check as per manufacturer's drawings and instructions.

c) Check for proper fixing on foundation and tightness of foundation bolds.

d) Tightness check of busbar joints & joint resistance check,

e) Tightness check of panel, circuit breaker, its control devices.

f) Check for free movement of operating and draw out mechanisms of circuit breaker.

g) Check for proper tightness of cables and earth connections.

h) Check for phase to phase and phase to earth electrical clearances.

i) Check for proper operation of electrical and mechanical interlock and manual tripping of breaker.

j) Check of cable junction boxes, k) Check of panel metallic conduits, l) Tightening of all terminal block connections. m) Painting and corrosion protection. n) Cleanliness of working area 27.2 Insulation/ Earthing Checks: a) Insulation test on main HT circuit (5KV Insulation Testing, b) DC/ AC High Pot Test, c) Insulation check on control circuit (500V Insulation Testing) d) Checks of earthing connections. 27.3 Check of Electrical Circuit: a) Conformity to the wiring diagram, b) Signalling (position, alarm, lockouts, trip circuit healthy etc.), c) Heating & lighting circuits, d) Auxiliary contacts, e) Operation of Anti Pumping feature in closing circuit, f) Check for electrical operation of VCBs, g) Stability checking of Bus differential Protection system, h) Polarity, Ratio check, knee point evaluation & IR Values check on CTs & PTs, i) Checking of PT fuse failure relays, DC loss relay etc, j) Testing of Relay setting for Over current, short circuit and earth fault protection for all the relays in consultation with Engineer in charge of OIL, k) Functional check of metering & indication circuits, l) Functional check of panel heaters & cubicle lights, m) ON/OFF operation of the circuit breakers, manually and electrically in Test, Service & isolation positions. 27.4 Mechanical tests and measurement. a) Check of circuit breaker draw out & insertion etc. b) Check of circuit breaker operating mechanism.	

c) Check of circuit mechanical interlock and manual tripping of breaker. d) Check on the functioning of the safety interlocks in the draw out mechanism e) Verification of the rated operating sequence. 27.5 Any other test as recommended by the manufacturer. 28.0 Services of at least one specialist Engineer from the manufacturer of the panels & circuit breakers should be made available at the site for a) Final checking of the VCB operation. b) Injection testing, relay setting. c) Final commissioning of the panel equipments and handover. 29.0 The specialist shall also explain and impart onsite training to OIL's operating and maintenance staff and Engineers about: a) Operation and maintenance of the panels & circuit breakers. b) Maintenance, repair and trouble-shooting of circuit breaker operating mechanism. 30.0 All important tests/ checks such as injection testing, Insulation testing etc. shall be done in presence of OIL's Engineer-In- Charge or his representative and test results has to be approved by OIL. 31.0 All tests results shall be recorded in a proper manner. Two sets of test results for each VCBs & panels shall be submitted to OIL for evaluation. The results shall be typed and properly documented/ signed. 32.0 The supplier shall take away the dismantled old switchgear panels with its accessories within 30 days from successful commissioning of all the new switchgear panels. 33.0 The commissioning shall be treated as complete only after successful commissioning of the panel, submission of all drawings & test reports & buyback of old switchgear panels as mentioned in the bid documents.	

Special Terms & Conditions of the Tender:

1. Bidder shall be a panel manufacturer/channel partner/ authorized dealer of 11KV switchgear panel with Vacuum Circuit Breaker (VCB). Bidders quoting on behalf of OEM shall submit copy of valid dealership certificate/ authorization letter/ certificate of channel partnership from the OEM along with the offer.

2. The bidder or their OEM shall have experience in design, manufacturing, testing, supply, installation and commissioning of minimum 1 set of 11KV switchgear panel with Vacuum Circuit Breaker (VCB), CTs, PTs, protection relays, indicating & measuring instruments in any Central Govt./Govt. PSU/Public Limited Companies during last 5 years as on bid closing date of this tender. Bidders quoting on behalf of OEM shall submit either their own or OEM's credentials such as PO copies with invoice/ performance certificate/ completion certificate/ commissioning report in design, manufacturing, supply and commissioning of panels.

3. It is essential for OIL to remove the old panels from the installation by the bidder, for which a buy back system is incorporated. It is therefore mandatory for the bidders to quote against buy back of the old panels on "as-is-where-is" basis.

4. In price schedule, buyback is incorporated and essential to be filled up by bidders. Details of the buy-back arrangement are given in the clause "Buy Back Arrangement" of clauses & Notes.

As bidder has to buy back old panel, bidder shall offer prices separately for both new switchgear panel as well as buy back price of old switchgear panel. Offers will be evaluated taking into account buy-back prices of old panel.

5. If all conditions are fulfilled, the purchase order will be awarded to the lowest (L1) bidder only.

6. In case of identical lowest offered rate by more than 1 (one) bidder, purchase order will be awarded on the basis of draw of lots between the parties offering the same lowest price.

7. Bidders are advised not to indicate any separate discount. Discount if any, should be merged with the quoted offer. Discount of any type indicated separately will not be taken into account for evaluation purpose. However, in the event such offer without considering discount is found to be lowest, OIL shall avail such discount at the time of award of purchase order.

8. Timely submission of the bids is the responsibility of the Bidder. Bid should be submitted before the bid closing date and time. Company (OIL) shall not be responsible for any delay and company will not entertain any correspondence in this regard.

9. Bidder shall submit the bid, duly completed in terms of all the Bid Documents required.

10. In case bidder takes exception to any clause of Tender Document, then OIL has the discretion to load or reject the offer on account of such exception, if the bidder does not withdraw / modify the deviation when / as advised by OIL. The loading so done by OIL will be final and binding on the Bidders.

11. Priced bids of only those bidders will be opened whose offers are found technically acceptable. The technically acceptable bidders will be informed before opening of the "priced bid".

12. To ascertain the substantial responsiveness of the bid, the Company reserves the right to ask the Bidder for clarification in respect of clauses covered under this tender.

13. The originals of documents [furnished by bidders(s)] shall have to be produced by the bidder(s) to OIL as and when asked for.

Notes

Supply, Installation, Testing, Commissioning & Energisation of 16 nos 11 KV Indoor Type switchgear panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels). Each Incomer/ Outgoing Feeders & Bus Coupler panels shall have 11 KV, 1250 A VCBs (31.5 KA Short circuit breaking capacity), control, monitoring devices & protection relays. Including dismantling and buy back of old Southern Switchgear make 18 nos 11 KV panels (16 nos Bulk Oil Circuit Breaker (BOCB) with 2 nos Bus PT, Bus CT cum Bus Adapter Panels) & other accessories (excluding its remote control panels & interconnecting HT cables & LT control cables).

1) In addition to the technical specifications provided under item no. 10, the bidder should also meet the requirements as per item no. 20, Dismantling of 18 nos old 11 KV switchgear panels and Installation, Testing, Commissioning & Energisation of new 16 nos 11 KV Switchgear panels.

2) Bidder shall fill up the enclosed Technical Evaluation Sheet for Special Terms & Conditions Of The Tender(Annexure-I), Technical Evaluation Sheet for Technical Specifications/ Scope of Work (Annexure-II), Technical Evaluation Sheet For Dismantling, Erection, Testing, Commissioning & Energisation (Annexure-III),DATA SHEET (Annexure-IV) and submit with the bid.

3) Bidder has to supply all the materials required under this PR and has to install & commission the same at site (Duliajan Power Station).

4) All the similar items used in different panels/ VCBs, shall be of same make of reputed brand.

5) All the items to be procured under this PR shall be delivered in a single lot.

6) Bidder shall provide Technical Literatures/ Catalogues of all the items (panels, VCBs, Relays, CTs, PTs, metering & indicating equipments etc.) along with the offer.

7) The manufacturer of offered panels shall have type test certificate for their designed, manufactured and supplied 11 kV Panels, 1250 A VCBs, CTs, PTs from CPRI or any other test house accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL) India. The bidder shall submit along with the bid, copies of Type test certificates for offered type of Panel, VCBs, CTs & PTs etc.

8) Representatives from prospective bidders may visit the site at Duliajan Power Station with prior information to CEE(Gen) before submitting their offer.

9) Bidder shall confirm that Routine Test & Warrantee Certificates of the VCBs & panels will be submitted along with the supply of materials.

10) Bidder shall confirm to provide spares and service back-up for at least 10 years after commissioning of the items.

11) Approval of drawings and design data: Successful Bidder i.e. Supplier shall obtain approval of drawings from OIL Prior to manufacturing of the panels & VCB. Supplier shall submit GA (dimensional) drawings and electrical control schematics of their offered VCBs & panels within 30 days from the issue of LOA.

12) Pre-dispatch Inspections & Testing:
a) Supplier shall arrange to conduct all routine tests at manufacturer's works in presence of OIL's representatives. [To and fro charges of OIL’s personnel to manufacturer’s works will be to OIL’s account].

b) Supplier shall intimate OIL regarding the date of inspection at least 3 weeks in advance.

c) Following minimum routine tests shall be carried out during Pre-dispatch Inspections:

(i) Checking of dimensional accuracy to the approved drawings,

(ii) High voltage & partial discharge tests on all HT parts (Bus Bar & Feeder chambers, VCBs, CTs & PTs etc.).

(iii) Mechanical and electrical interlock operation tests of the VCBs with panels,

(iv) Ratio check of CTs & PTs,

(v) Supplier shall arrange primary & secondary injection tests for simulation & testing of the protection relays (feeder protection & bus zone protection),

(vi) Supplier shall demonstrate interlock & protection tripping of the VCBs during the inspection.

(vii) All routine tests shall be carried out as per relevant IS or IEC.

d) After inspection is over, the supplier will immediately send all the reports to OIL. OIL shall study and evaluate the reports and accordingly issue dispatch clearances only after evaluating satisfactory test reports of the Panels & VCBs.

13) DOCUMENTS TO BE SUBMITTED AT VARIOUS STAGES:

The bidder/supplier shall supply the following documents at various stages as mentioned below:-

a) With Bid: Two sets each comprising of the following:-

(i) Detailed description and complete specification of the offered panels & VCBs.

(ii) General arrangement drawing of the switchgear panel.

(iii) Filled up Data sheets with necessary information as per Annexure- I, II, III & IV.

(iv) Technical Literatures/ Catalogues of all the items (panels, VCBs, Relays, CTs, PTs, metering & indicating equipments etc.).

(v) List of clients/industries with full particulars/address and references regarding supply of offered panels & VCBs.

(vi) Documentary evidence of bidder's experience in HT installation works.

(vii) Copy of report of type tests done on similar panels, VCBs, CTs, PTs & Panels at CPRI or any other NABL accredited laboratory.

(viii) In case of bidder other than manufacturer, an undertaking from the panel manufacturer stating that in the event of an order on the party, the panel manufacturer will supply the panel through the party as per specifications of the tender and order.

b) For approval prior to manufacturing: Two sets comprising of the followings must be submitted to OIL for approval within 30 days after placement of the order. The manufacture of panel should start only after approval of the drawings by OIL.

(i) Detail General Arrangement & foundation drawing of VCBs & panels showing dimensions ,
(ii) Electrical Control circuit schematics.
(iii) Drawing of panel with detail of HT and LT cable boxes showing termination details,
(iv) Complete bill of materials to be used in the panel & VCBs.

c) For approval prior to dispatch: Two hard bound sets comprising of the following:-
(i) Results of Routine tests corresponding to each VCBs & panels; carried out at manufacture's works/ factory in presence of OIL's representatives.

d) With Supply: Two sets comprising of the followings:-
(i) Guarantee/ Warranty certificates for each VCBs & panels separately.
(ii)Installation, Commissioning Manuals- for VCBs & panels.

(iii) Operation and Maintenance Manuals- for VCBs & panels.
(iv) Literature of main components like protection & auxiliary relays
(v) General arrangement & foundation dimensional drawings.
(vi) Electrical Schematic diagram and wiring diagrams
(vii) List of recommended spares for the VCBs & panel accessories adequate for two years. The spares list must include part no. of each component.

e) After commissioning: Two hard bound sets comprising of the following:-
(i) As built drawings (General Arrangement/ Dimensional, control circuit)
(ii) Commissioning test results - corresponding to each VCBs & panels.
(iii) Guarantee certificate duly signed by the party.

14) Markings:
a) Markings on VCBs: All the VCBs shall be marked with Manufacturer's name, Recognized Trade Marks, Serial No., Type, Rated Voltage/ Currents, Short Circuit Current, Operating Sequence, Auxiliary Voltage for closing and tripping coils, Auxiliary voltage for spring charging motor, Weight, Year of Manufacture and Reference of IS/ IEC Standard etc.

b) Panel Markings: Name of the panel manufacturer, year of manufacturing, OIL WBS no PI.15ASEE.004.01: Year 2015 shall be indicated at one location preferably at front side of the bus coupler panel.

The markings and identifications of apparatus, conductors, terminals shall be as per IS 5578 & IS 11353. All switchgear panels shall have the following identification markings in a permanent manner & easily readable manner:
(i) Individual Panel names shall be on front, rear & top side.
(ii) Caution boards conforming to IS-2551 for 11 KV grade, shall be both at front and rear sides in each panels.
(iii) Individual Panel ratings shall be marked at the inside of front control panel.
(iv) Individual CT specification shall be marked on at the body of the CTs for Metering, Feeder & bus zone protection and same shall be marked at the inside of front control panel also.
(v) Individual PT specification shall be marked on at the body of the PTs for Metering & protection and same shall be marked at the inside of front control panel also.

15) Painting and Preservation:
a) All parts of the goods/ equipments shall be brand new, free from cracks, pits, blow holes, seams and other manufacturing defects.
b) All metallic parts of the goods/ equipments shall be protected against rusting by suitable coatings or paints.

16) Packing:
Packaging of the goods/ equipments shall be adequate to avoid any transit damages. The Packaging shall have adequate weather proof protection to avoid damage and ingress of water during transit. Carrier should be strictly advised to handle the materials carefully.

Any damage to the panel during transportation from factory to the site will be to party's account and the party will have to carry out necessary repair or replacement to OIL's satisfaction at their own cost.

17) Warranty: The goods/ equipment shall be of best quality and workmanship. The equipment shall be guaranteed for 12 (Twelve) months from the date of commissioning against defects arising due to material, workmanship or design. The party must replace/ rectify defects arising from faulty design, material, workmanship and installation during the warrantee period at their own cost.

18) Bidders shall summarize the deviations if any, separately in their offer documents with a heading "Deviations Report". Otherwise they will write "NO DEVIATION FROM ENQUIRY".

NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

TECHNICAL EVALUATION SHEET FOR DISMANTLING, ERECTION, TESTING, COMMISSIONING **ANNEXURE- III**

Terms & Conditions For Dismantling, Erection, Testing, Commissioning & Energisation At Site

SL No:	Clause no of Tender Specification	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
1	1.0	1.0 The successful bidder shall start to carryout dismantling, installation jobs within 30 days of material received at site.		
2	2.0	2.0 All dismantling, installation and commissioning jobs shall be completed at the earliest and in no case shall exceed maximum 60 days.		
3	3.0	3.0 The successful bidder shall submit to OIL detailed work plan for Dismantling, Installation & commissioning of the11 KV switchgear at least 30 days ahead of the proposed date.		
4	4.0	4.0 Necessary shutdown arrangements for the panels shall be arrange by OIL.		
5	5.0	5.0 Due to operational requirements, the dismantling of the old switchgear may have to be done in two phases. Accordingly arrangements may have to be made to remove de-energized old panels on one side of bus coupler, carryout installation of new panels on that side and after that, energise this section of the new switchgear. Similarly carry out jobs on the other section and finally complete new switchgear with bus coupler arrangement shall be commission.		
6	6.0	6.0 The vendor shall carry out dismantling of the existing 11 KV switchgear after obtaining proper shutdown clearance from OIL only.		
7	7.0	7.0 In the existing switchgear room, if any civil constructional modifications (floor cut outs for cable entry, floor levelling, grouting of panels or fixing of anchor fastener etc.) are required, same shall be carried out by the vendor after obtaining approval from CEE (G).		
8	8.0	8.0 If removal of the old panels requires braking of side wall, same shall be done by the contractor after availing due permission from CEE (Gen). Again after installation of the new panels, reconstruction, painting of the wall shall be done by the vendor. However size of the existing switchgear room shall not be altered.		
9	9.0	9.0 The panel will be placed inside the switchgear room by the party. After placement, all the panels shall be grouted or fixed by anchor fastener to the floor by the party.		
10	10.0	10.0 All manpower, vehicles and any other facility required for storage, transfer & placement of panel inside the switchgear room will be arranged by the party at their own cost.		

TECHNICAL EVALUATION SHEET FOR DISMANTLING, ERECTION, TESTING, COMMISSIONING **ANNEXURE- III**

Terms & Conditions For Dismantling, Erection, Testing, Commissioning & Energisation At Site

SL No:	Clause no of Tender Specification	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
11	11.0	11.0 After placement inside the switchgear room, the panel will be checked for any defect / discrepancies in presence of OIL's engineer and rectification of the same will be done to by the party at their own cost.		
12	12.0	12.0 The contractor shall carry out Installation, testing & commissioning of the new 11 KV panels & VCBs at the site, to the full satisfaction of OIL.		
13	13.0	13.0 All installation, testing & commissioning shall be carried out in compliances with latest Indian Standard specifications and Indian Electricity Acts and National Electric Code in force.		
14	14.0	14.0 All OIL's safety and local/ government regulations shall be followed during installation, testing and commissioning.		
15	15.0	15.0 The contractor shall perform all works of installation, testing and commissioning under direct supervision of minimum one of his experienced supervisor possessing valid Electrical Supervisor's Certificate of Competency [with minimum parts 1, 2, 3, 4, 5a, 5b & 6] issued or recognized by State Electrical Licensing Board, Govt. of Assam. The supervisor must have experience of at least carrying out installation & commission of one 11 KV VCBs & panels Documentary evidence in this regard shall be submitted prior to execution of the jobs at site.		
16	16.0	16.0 All electrical works shall be done by persons having valid Electrical Wireman Permits [with minimum parts 1 & 2] issued or recognized by State Electrical Licensing Board, Govt. of Assam. Documentary evidence in this regard shall be submitted prior to execution of the job at site.		
17	17.0	17.0 All jobs shall be carried out under the direction of CEE (G), OIL or his authorized representative.		
18	18.0	18.0 The job shall require continuous presence of the supplier or his authorized representative's for quality monitoring and co-ordination.		
19	19.0	19.0 The supplier should provide authorized identity card/Photo Pass (duly attested by him) to all his workmen to be engaged for installation & commissioning of panels mentioning the PO No., their key nos, job role and area of operation.		
20	20.0	20.0 The supplier shall provide PPEs to all his personnel and his employees shall wear PPEs while working during the installation & commissioning jobs.		

TECHNICAL EVALUATION SHEET FOR DISMANTLING, ERECTION, TESTING, COMMISSIONING **ANNEXURE- III**

Terms & Conditions For Dismantling, Erection, Testing, Commissioning & Energisation At Site

SL No:	Clause no of Tender Specification	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
21	21.0	21.0 All tools for installing and instruments for testing and commissioning shall be arranged/ provided by the contractor. The contractor must arranged/ provided the following tools:		
22	21.0 a)	a) 5 kV Digital Insulation Tester of reputed make,		
23	21.0 b)	b) Secondary current Injection Testing Set,		
24	21.0 c)	c) AC Primary current injection kit upto 2000 A range,		
25	21.0 d)	d) AC & DC High Pot Tester upto 28 KV range,		
26	21.0 e)	e) Discharge stick,		
27	21.0 f)	f) Digital multifunction meter,		
28	21.0 g)	g) Earth Tester with accessories,		
29	22.0	22.0 The contractor shall be responsible for safe custody and proper storage of materials till handing over.		
30	23.0	23.0 Any additional electrical items without which the job cannot be completed shall be provided by the contractor.		
31	24.0	24.0 No temporary electrical wiring shall be done by the supplier during testing & commissioning without the permission of OIL's Engineer-in- Charge. Any power supply arrangements required for installation, testing & commissioning jobs; shall be provided by OIL at one point. The vendor shall		
32	25.0	25.0 OIL will supply all H.T power cables.		
33	26.0	26.0 During execution of jobs under this tender, no Accommodation, Transport, Fooding facilities etc. shall be provided to the Party by OIL.		
34	27.0	27.0 Following should be minimum program for commissioning after complete erection-		
35	27.1	27.1 General Checks		
36	27.1 a)	a) Physical inspection for damages and external defects.		
37	27.1 b)	b) Assembly check as per manufacturer's drawings and instructions.		
38	27.1 c)	c) Check for proper fixing on foundation and tightness of foundation bolds.		
39	27.1 d)	d) Tightness check of busbar joints & joint resistance check,		
40	27.1 e)	e) Tightness check of panel, circuit breaker, its control devices.		

TECHNICAL EVALUATION SHEET FOR DISMANTLING, ERECTION, TESTING, COMMISSIONING **ANNEXURE- III**

Terms & Conditions For Dismantling, Erection, Testing, Commissioning & Energisation At Site

SL No:	Clause no of Tender Specification	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
41	27.1 f)	f) Check for free movement of operating and draw out mechanisms of circuit breaker.		
42	27.1 g)	g) Check for proper tightness of cables and earth connections.		
43	27.1 h)	h) Check for phase to phase and phase to earth electrical clearances.		
44	27.1 i)	i) Check for proper operation of electrical and mechanical interlock and manual tripping of breaker.		
45	27.1 j)	j) Check of cable junction boxes,		
46	27.1 k)	k) Check of panel metallic conduits,		
47	27.1 l)	l) Tightening of all terminal block connections.		
48	27.1 m)	m) Painting and corrosion protection.		
49	27.1 n)	n) Cleanliness of working area		
50	27.2	27.2 Insulation/ Earthing Checks:		
51	27.2 a)	a) Insulation test on main HT circuit (5KV Insulation Testing,		
52	27.2 b)	b) DC/ AC High Pot Test,		
53	27.2 c)	c) Insulation check on control circuit (500V Insulation Testing)		
54	27.2 d)	d) Checks of earthing connections.		
55	27.3	27.3 Check of Electrical Circuit:		
56	27.3 a)	a) Conformity to the wiring diagram,		
57	27.3 b)	b) Signalling (position, alarm, lockouts, trip circuit healthy etc.),		
58	27.3 c)	c) Heating & lighting circuits,		
59	27.3 d)	d) Auxiliary contacts,		
60	27.3 e)	e) Operation of Anti Pumping feature in closing circuit,		
61	27.3 f)	f) Check for electrical operation of VCBs,		
62	27.3 g)	g) Stability checking of Bus differential Protection system,		
63	27.3 h)	h) Polarity, Ratio check, knee point evaluation & IR Values check on CTs & PTs,		
64	27.3 i)	i) Checking of PT fuse failure relays, DC loss relay etc,		
65	27.3 j)	j) Testing of Relay setting for Over current, short circuit and earth fault protection for all the relays in consultation with Engineer in charge of OIL,		

TECHNICAL EVALUATION SHEET FOR DISMANTLING, ERECTION, TESTING, COMMISSIONING **ANNEXURE- III**

Terms & Conditions For Dismantling, Erection, Testing, Commissioning & Energisation At Site

SL No:	Clause no of Tender Specification	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
66	27.3 k)	k) Functional check of metering & indication circuits,		
67	27.3 l)	l) Functional check of panel heaters & cubicle lights,		
68	27.3 m)	m) ON/OFF operation of the circuit breakers, manually and electrically in Test, Service & isolation positions.		
69	27.4	27.4 Mechanical tests and measurement.		
70	27.4 a)	a) Check of circuit breaker draw out & insertion etc.		
71	27.4 b)	b) Check of circuit breaker operating mechanism.		
72	27.4 c)	c) Check of circuit mechanical interlock and manual tripping of breaker.		
73	27.4 e)	d) Check on the functioning of the safety interlocks in the draw out mechanism		
74	27.4 f)	e) Verification of the rated operating sequence.		
75	27.5	27.5 Any other test as recommended by the manufacturer.		
76	28.0	28.0 Services of at least one specialist Engineer from the manufacturer of the panels & circuit breakers should be made available at the site for		
77	28.0 a)	a) Final checking of the VCB operation.		
78	28.0 b)	b) Injection testing, relay setting.		
79	28.0 c)	c) Final commissioning of the panel equipments and handover.		
80	29.0	29.0 The specialist shall also explain and impart onsite training to OIL's operating and maintenance staff and Engineers about:		
81	29.0 a)	a) Operation and maintenance of the panels & circuit breakers.		
82	29.0 b)	b) Maintenance, repair and trouble-shooting of circuit breaker operating mechanism.		
83	30.0	30.0 All important tests/ checks such as injection testing, Insulation testing etc. shall be done in presence of OIL's Engineer-In- Charge or his representative and test results has to be approved by OIL.		
84	31.0	31.0 All tests results shall be recorded in a proper manner. Two sets of test results for each VCBs & panels shall be submitted to OIL for evaluation. The results shall be typed and properly documented/ signed.		

TECHNICAL EVALUATION SHEET FOR DISMANTLING, ERECTION, TESTING, COMMISSIONING **ANNEXURE- III**

Terms & Conditions For Dismantling, Erection, Testing, Commissioning & Energisation At Site

SL No:	Clause no of Tender Specification	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
85	32.0	32.0 The supplier shall take away the dismantled old switchgear panels with its accessories within 30 days from successful commissioning of all the new switchgear panels.		
86	33.0	33.0 The commissioning shall be treated as complete only after successful commissioning of the panel, submission of all drawings & test reports & buyback of old switchgear panels as mentioned in the bid documents.		

TECHNICAL EVALUATION SHEET FOR TECHNICAL SPECIFICATIONS/ SCOPE OF WORK **ANNEXURE- II**

Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
1	A.	**A. Background Information:** The existing Southern Switchgear make 18 nos 11 KV panels (16 nos Bulk Oil Circuit Breakers with additional 2 nos Bus PT, Bus CT cum Bus Adapter Panels) were installed, along with the Waste Heat Recovery Project at Duliajan Power Station in the year 1984. The breakers were of vertical isolation type Bulk Oil Circuit Breakers (BOCB). Presently spare parts for these breakers & panels are not readily available and these have exhibited deterioration due to ageing. Moreover, the OEM of the panel & BOCB's namely M/s Southern Switchgear India have closed down and ceased to exist since nineties. The layout of the existing switchgear room is shown in the attached **Annexure-V.** The switchgear room is having underground RCC cast / brick walled cable cellar of depth 1.94 m and all incoming/ outgoing HT cable feeders are routed through this cable cellar. Presently it is proposed to replace the Southern Switchgear panels & breakers with new state of art horizontal separation & horizontal draw out type VCB panels. It is also proposed to relocate the incomers from 2 x 14.45 MW Gas Turbine Generators and some of the important 11 KV outgoing feeders from the existing Reyrolle Burn switchgear of Duliajan power Station to the proposed new switchgear; as spare parts for these breakers & panels are not readily available and these also have exhibited deterioration due to ageing. Again the new switchgear is proposed to be interconnected by two feeders with 11 KV Switchgear of the 20 MW Gas Turbine for to & fro power transfer as required.		
2	B.	**B. Scope of Work:** This Specification covers the design, manufacture of complete switchgear with all accessories as specified hereinafter at the manufacturer's factory, testing, painting, packing for transport, installation, commissioning & energisation of 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler with additional 2 nos Bus PT, Bus CT cum Bus Adapter Panels). Each Incomer/ Outgoing Feeders & Bus Coupler shall have 11 KV, 1250 A (31.5 KA Short circuit breaking capacity) VCBs, control, monitoring devices & protection relays. The switchgear shall be multi panel, Indoor Type having Vacuum Circuit Breakers with motor operated spring charge mechanism, electrical/ manually open/close operable & with shunt trip feature. The successful bidder has to dismantle the old switchgear, carryout civil modification jobs as required, supply new panel with VCBs & its accessories and carryout installation, commissioning & energisation of the same at site (as per clause 20: Dismantling of old 11 KV switchgear panels and Installation, Testing, Commissioning & Energisation of new 11 KV Switchgear panels).		
3	C. C. (a) C. (b) C. (c) C. (d) C. (e)	**C. Site Condition:** The switchgear panels shall be installed in a room without air conditioning but with ventilation to allow natural cooling. Therefore all the protection and control devices employed shall be capable of operating in this environment without failure for their designed life time. Particularly the power supply modules of the protection and control The panel shall be designed to work under following adverse environmental conditions: a) Maximum Ambient air temperature : 40 deg C b) Minimum Ambient air temperature: 2.5 deg C c) Maximum humidity at site (at 40 deg C): 98 % d) Surrounding atmospheric condition : Humid e) Site altitude: 150 mtr.		
4	D. 1.0	**D. <u>Technical Specification:</u>** **1.0** Supply of 11 KV VCB Panels shall be with the following specifications: The panels shall be fully factory built and shipped in suitable sized pre assembled units to meet transportation requirements and finally to be assembled at site for installation. The switchgear shall be of single bus bar design having two sections (Bus Section A & Bus Section B) and shall have one bus coupler breaker having bus synchronizing & dead bus closing provision. The new 11 KV Switchgear Panel shall comprise of 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels). Each Incomer/ Outgoing Feeders & Bus Coupler shall have 11 KV, 1250 A (31.5 KA Short circuit breaking capacity) VCBs, control, monitoring devices & protection relays. The switchgear shall have following panels: a) 6 nos. 1250 A VCB Incomer Feeders, b) 7 nos. 1250 A VCB Outgoings Feeders,		

TECHNICAL EVALUATION SHEET FOR TECHNICAL SPECIFICATIONS/ SCOPE OF WORK **ANNEXURE- II**

Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
		c) 1 no. 1250 A VCB Bus Coupler, d) 1 no. Bus PT, Bus CT cum Bus Adapter Panel for Bus Section A e) 1 no. Bus PT, Bus CT cum Bus Adapter Panel for Bus Section B Proposed single line diagram (SLD) is shown in the attached Annexure- VI & proposed layout of the switchgear is shown in is shown in the attached Annexure- VII. The name of the proposed panels shall be as follows: a) Panel 1: Interconnection #1 to 20 MW GTG#3 Bus (1250A) b) Panel 2: Feeder -1 (1250A) c) Panel 3: Interconnection #1 to Old GT Bus (1250A) d) Panel 4: Feeder -2 (1250A) e) Panel 5: GTG #1 Incomer(1250A) f) Panel 6: Feeder -3 (1250 A) g) Panel 7: Bus PT, Bus CT cum Bus Adapter Panel for Bus Section A h) Panel 8: Bus Coupler (1250A) i) Panel 9: Bus PT, Bus CT cum Bus Adapter Panel for Bus Section B j) Panel 10: Interconnection #2 to Old GT Bus (1250A) k) Panel 11: Feeder -4 (1250A) l) Panel 12: Feeder -5 (1250A) m) Panel 13: Feeder -6 (1250 A) n) Panel 14: Feeder -7 (1250 A) o) Panel 15: GTG #2 Incomer(1250A) p) Panel 16: Interconnection #2 to 20 MW GTG #3 Bus (1250A) The panels, VCBs shall be Designed, manufactured and tested in accordance with IS-13118:2002, IS-14658:2000, IS-2071 Part 1,2 & 3: 1993, IS-3427: 1997, IS-IEC-62271-201-2006, IS 12729:2004 (IEC 60694:2002) & IEC 61850 and shall be in compliances with any other relevant latest Indian Standard specifications, Indian Electricity Acts and National Electric Code in force. The bidder shall specifically state the precise standard, complete with identification number, to which the various equipment and materials are manufactured and tested. The manufacturer of offered panels shall have type test certificate for their designed, manufactured and supplied 11 kV Panels, 1250 A VCBs, CTs, PTs from CPRI or any other test house accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL) India.		
5	2.0	**2.0 PANEL CONSTRUCTION:** The panel construction shall be as described below:		
6	2.0. a)	a) Enclosure Type: Dead front, floor- standing, rigid welded steel frames fully compartmentalized, Metal clad, Vermin Proof, suitable for indoor installation and provision for bolting/ grouting to the floor.		
7	2.0. b)	b) Enclosure degree of protection: Degree of protection shall be Minimum IP 3XD or 4X for all High and low Voltage compartments.		
8	2.0. c)	c) Enclosure material shall be CRCA steel.		
9	2.0. d)	d) Load bearing members shall be minimum 2.5 mm thick.		
10	2.0. e)	e) Doors, internal partitions and side covers shall be minimum 2.0 mm thick.		
11	2.0. f)	f) Top covers & Bottom covers shall be minimum 2.5 mm thick.		
12	2.0. g)	g) The sheet metal should be given seven tanks anti corrosion treatment & then powder coated. Panel manufacturer must have powder coating facilities for painting of panels.		
13	2.0. h)	h) Colour of the panels shall be **powder coating Pabble grey to shade RAL7032** on inside & outside surfaces. Bus Bar & Feeder shutters shall be painted in Red and marked with yellow letters.		

TECHNICAL EVALUATION SHEET FOR TECHNICAL SPECIFICATIONS/ SCOPE OF WORK **ANNEXURE- II**

Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
14	2.0. i)	i) The new panels shall be so arranged in the existing room that there shall be at least 1 m gap from both side walls and backside and at least 2 m gap at the front side.		
15	2.0. j)	j) Height of Panel: Maximum panel height shall be 2700mm, however all control & protection devices shall not be at height more than 2300mm.		
16	2.0. k)	k) Width of Panel: Maximum individual panel width shall be 700 mm, this is required to facilitate 16 nos main breaker panels in the existing switchgear room; as the room has space constraints.		
17	2.0. l)	l) Extensibility of compartments shall be on either end sides of the switchgear.		
18	2.0. m)	m) Breaker compartment door: Design with breaker trolley as the front cover shall not be acceptable. Breaker compartment door shall be of front open type. Three nos. of bright steel hinges shall be used on door with door opening limited to 110 Degree (approx). Doors shall be easily removable for maintenance and each door shall be provided with lockable handle.		
19	2.0. n)	n) Separation of Breaker to bus bar & cable compartment shall be through seal off bushings.		
20	2.0. o)	o) Each cubicle/ compartment shall be separated from adjacent one by sheet steel barrier. However the bus section of each panel shall be separated by epoxy reinforced fibre glass insulating barrier or equivalent.		
21	2.0. p)	p) Each panel shall be self contained i.e if any of the side panel is removed, it will not affect the remaining panels.		
22	2.0. q)	q) Exposure to live parts: In case the VCB breaker panel door is required to be opened during any contingency, the personnel should not be exposed to any live parts. Breaker front side with the operating mechanism should have suitable shrouds / barriers / insulating sleeves as required preventing exposure to high voltage live parts.		
23	2.0. r)	r) Self operating shutters for shielding live fixed contacts of bus & feeder side shall be provided; which will close automatically when VCB truck is withdrawn to test position.		
24	2.0. s)	s) Bus support insulator: Non hygroscopic, track-resistant, high strength, epoxy insulators (calculation for validating dynamic force withstand capability to be submitted during detailed engineering).		
25	2.0. t)	t) Fixing arrangement for doors & covers: All doors & covers shall be concealed hinged bolted with SS bolts. Suitable gaskets & washers shall be provided on all joints.		
26	2.0. u)	u) Panel Base Frame: Steel base frame as per manufacturer's standard shall be supplied along with the panels.		
27	2.0. v)	v) Removable bolted covers for cable chamber and bus bar chamber shall be provided with C type handles.		
28	2.0. w)	w) Prevention of Internal Arc: Panel shall be type tested against internal arc as per provision in IEC 62271- 201: 2006 Annexure A. The Bus bars/ Breaker/ Cable and CT chambers shall be provided with arc venting outlet/ Pressure relief devices on the top of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel. The doors of the compartment shall be capable of withstanding the effects of maximum internal arcing fault without being blown off and causing danger to personnel and other equipment. Supporting documents of type test as per relevant IEC standard to this effect shall be provided along with the offer.		
29	2.0. x)	x) All nut & bolts used in the panel should be of high tensile, bright zinc plated, hexagonal headed, metric size, manufacture to DIN 931 from 8.8 grade of steel, minimum tensile strength shall be 80kgf/SQ.MM. The nut & bolts threads shall be of coarse type and shall be fitted with bright zinc plated flat and spring washers (two nos each.		
30	2.0. y)	y) Proper sized lifting hooks shall be provided for handling of the panels.		
31	2.0. z)	z) The panel shall be provided with 2 nos 80 W space heaters in each cubicle. Heater circuits of each panel shall be provided with ON/OFF switch and protected by suitable rated HRC fuses. Adjustable thermostats (for auto on/off) of suitable rating shall be provided to control the cubicle temperature.		
32	3.0	**3.0 CUBICLES AND PANEL DETAILS: The switchgear panel shall comprise of separate compartments for the followings:** a) Bus bar compartment, b) Circuit Breaker Compartment, c) HV incoming/ outgoing Feeder Protection & Metering CTs compartment,		

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Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
		d) HV incoming/ outgoing Cable Terminal box, e) HV incoming/ outgoing feeder PT compartment, f) Bus PT compartment with Bus CTs , g) Control, Protection & metering compartment (LT compartment). The detailed specifications of the above compartments are given below:		
33	3.0 a)	**a) Bus Bar Compartment**:		
34	3.0 a) (i)	(i) The panel shall be designed for 11KV, 3 phase 50 HZ operation with simplex three phase copper bus bar with current rating of 1600 Amp and suitable for short circuit capacity 31.5 KA for 3 second.		
35	3.0 a) (ii)	(ii) Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% high conductivity. Busbar current rating-1600 Amp. Fault current rating- 31.5 kA for 3 sec.		
36	3.0 a) (iii)	(iii) Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on busbar, its risers. Thickness of bus bar sleeve shall be 3 mm and shall be made of Raychem RPG 11 kV grade or equivalent. Bus bar interconnection bolts & HT cable terminal connections shall be first wrap with black mastic compound or equivalent and then covered with Heat shrinkable insulation tape of 11KV voltage grade.		
37	3.0 a) (iv)	(iv) Bus bar arrangement should be such that in future if required, similar cubicles can be connected to its both side end cubicles.		
38	3.0 a) (v)	(v) Cast epoxy insulator supports shall be provided for bus bar and shall be designed to withstand full short circuit current at specified fault level for 3 seconds.		
39	3.0 a) (vi)	(vi) Risers & connections and shall be marked in different conventional colour codes for identification of three different phases (R, Y, B).		
40	3.0 b)	**b) Circuit Breaker Compartment**: The circuit breakers shall be mounted on horizontal draw out truck. The circuit breaker truck should have vacuum interrupting device with horizontal isolation system. Detailed requirements of VCBs is given in the section 4.0.		
41	3.0 b) (i)	(i) Breaker rack-in/ rack-out, spring charge and breaker open / close operation should be able to carry out with suitable mechanism, having the breaker cubicle door in closed position.		
42	3.0 b) (ii)	(ii) Mechanical type interlock shall be provided so that during normal operation, breaker compartment door cannot be open; unless breaker is racked out to test/ isolated position. However for maintenance, same can be easily disabled if required.		
43	3.0 b) (iii)	(iii) Breaker compartment door closing should be possible when breaker is in isolated or service position.		
44	3.0 b) (iv)	(iv) The front door shall have view glass to facilitate observation of mechanical ON/OFF indication, spring charge/discharge and operation counter etc. The glass shall have sufficient toughness to withstand internal arc pressure as per IEC 62271- 201: 2006.		
45	3.0 b) (v)	(v) Each breaker compartment shall have three positions namely Service position, Test/ Isolated position and Withdrawal position. All positions shall be properly marked and shall be visible from outside with the front cover in closed condition.		
46	3.0 c)	**c) HV incoming/ outgoing Feeder Protection & Metering CTs compartment**:		
47	3.0 c) (i)	(i) Feeder CT compartment shall be provided on all incomer/ outgoing feeder panel to facilitate installation of protection & metering of CTs.		
48	3.0 c) (ii)	(ii) The feeder CT and the cable compartment shall be in the rear with bottom cable entry provision.		
49	3.0 c) (iii)	(iii) The LT control cables from CTs shall terminate in a separate box. From this terminal box, LT control cables shall be drawn to the front Relay & metering compartment through a detachable metallic conduit (pipe or rectangular); so as to have isolation from high voltage terminals.		
50	3.0 d)	**d) HV incoming/ outgoing Cable Terminal box:**		
51	3.0 d) (i)	(i) The cable termination shall be located at least 250 mm from the CT primary terminals for easy in maintenance.		
52	3.0 d) (ii)	(ii) HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided at the rear bottom side of the panel.		

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53	3.0 d) (iii)	(iii) Each cable termination to be connected to termination links with minimum two sets of suitable nuts, bolts and spring washers.		
54	3.0 d) (iv)	(iv) For HV cable termination in the cable compartment minimum height of 750mm shall be maintained to accommodate the heat shrinkable type indoor cable termination.		
55	3.0 d) (v)	(v) Gland Plate (detachable type): All the cable entry plates shall have removable gland plates. Gland plates shall be of 3.0mm thick MS detachable type for 3 core cable and aluminium 5.0mm for single core cables. Cable compartment shall have an anti vermin guard plate for protection against entry by insects, rodents etc.		
56	3.0 d) (vi)	(vi) Cast epoxy insulator supports shall be provided for cable termination links and shall be designed to withstand full short circuit current at specified fault level for 3 seconds.		
57	3.0 d) (vii)	(vii) Incomer feeder cable boxes should be of suitable sized for safe entry of two nos per phase single core cables of size 400 sq mm of Cu conductor 11kV grade, XLPE insulated, PVC sheathed, Armoured cable.		
58	3.0 d) (viii)	(viii) Outgoing feeder cable boxes should be of suitable sized for safe entry of one/ two nos per phase single core cables or 3 core cables of maximum sized 240sq. mm or 120 sq. mm of Cu conductor, 11kV grade, XLPE insulated, PVC sheathed, Armoured cables.		
59	3.0 d) (ix)	(ix) The cable termination arrangement should be such that it should be possible to disconnect/ isolate one cable in the event of fault in that cable and power-up the unit with the other cable.		
60	3.0 d) (x)	(x) Suitable sized heavy duty double compression cable glands shall be provided for all the cable boxes. Cable glands shall be of Stainless steel & make Dowell/gland make/Jainson/Baliga.		
61	3.0 d) (xi)	(xi) Cable termination kit: Following HT Cable terminal kits shall be supplied along with the panels: i. HT Cable Termination Kit, Indoor, 11kV, 1C x 400 sqmm, XLPE - 12 nos ii. HT Cable Termination Kit, Indoor, 11kV, 3C x 240 sqmm, XLPE - 4 nos iii. HT Cable Termination Kit, Indoor, 11kV, 3C x 120 sqmm, XLPE - 8 nos All the cable termination kits hall be of Heat Shrinkable type and having the following features: Voltage grade: 11,000 V AC, Cable Type : Cross linked polyethylene (XLPE), Armoured, Type of kit: Indoor, Shelf life : Minimum 5 years, Make: Raychem/Heat shrink/ Xicon. The cable termination kit packages shall contain the following information/ documents: Make, Batch no., Date of manufacture, Date of expiry, Shelf life of the kit, Guarantee certificate, Installation manual.		
62	3.0 e)	**e) HV incoming/ outgoing feeder PT compartment:**		
63	3.0 e) (i)	(i) All the Feeder PTs shall be of horizontally draw out type.		
64	3.0 e) (ii)	(ii) PTs shall be mounted on the top of the panel or shall be mounted on compartment below the VCB compartment.		
65	3.0 e) (iii)	(iii) Mounting of PT on the feeder breaker truck itself, shall not be acceptable (This is required to ensure whether the outgoing feeder is live or not; even when the breaker is not inside the panel. As per normal practice, the feeder PT will be withdrawn only when the feeder is not charged).		
66	3.0 e) (iv)	(iv) In case Feeder PT is mounted on the panel rear top, access to the PT must be available and the panel top cover reinforcement shall be sufficient for allowing a person to stand on the top.		
67	3.0 e) (v)	(v) All the PTs shall be provided with metallic shutter mechanism to prevent exposure of live parts when the PT is taken out to withdrawal position. Shutter mechanism shall be such that in service position, the shutters does not touch PT's HT insulators.		

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68	3.0 e) (vi)	(vi) Sealing arrangement shall be provided to keep the PT's HT insulators unexposed in service position.		
69	3.0 e) (vii)	(vii) PT service position locking mechanism shall be provided and same shall be indicated by bidder in relevant drawing.		
70	3.0 f)	**f) Bus PT & Bus CT compartment:**		
71	3.0 f) (i)	(i) In each section of the bus bar; there shall be one PT.		
72	3.0 f) (ii)	(ii) Their location shall be on both sides of the bus coupler breaker; to monitor Bus voltages and to facilitate synchronization/ dead bus closing to deliver power from one section to the other.		
73	3.0 f) (iii)	(iii) All the Bus PTs shall be of horizontally drawout type.		
74	3.0 f) (iv)	(iv) Mounting of PT on the bus coupler breaker truck itself, shall not be acceptable.		
75	3.0 f) (v)	(v) Bus PTs shall be mounted on the top of the panel or shall be mounted on compartment below the Bus trunking compartment.		
76	3.0 f) (vi)	(vi) Bus CT compartment: Bus CT compartment shall be provided on both sides of the bus coupler breaker panel to facilitate installation of Bus CTs (1 no each phase) for Main Bus Differential Protection and directional over current/ earth fault type secondary Bus Zone Protection system.		
77	3.0. g)	**g) Control, Protection & metering compartment (LT compartment):**		
78	3.0. g) (i)	(i) The L.T. chamber of suitable height shall be positioned at the front, on the top of the VCB chamber & shall be isolated from the live HT parts.		
79	3.0. g) (ii)	(ii) The compartment shall be with door of front open type. Three nos. of bright steel hinges shall be used on front door with door opening limited to 110 Degree (approx) and each door shall be provided with lockable handle.		
80	3.0. g) (iii)	(iii) Protective relay, measuring equipments and auxiliary controls along with the switches and indications are to be accommodated in this L.T. compartment.		
81	3.0. g) (iv)	(iv) All devices in the LT box are to be marked with permanent labels.		
82	3.0. g) (v)	(v) One no cubicle lamp (15 W CFL) shall be provided in each control & relay cubicle along with ON/OFF switch.		
83	3.0. g) (vi)	(vi) Panel rating plate shall be provided inside/outside the LT compartment.		
84	3.0. g) (vii)	(vii) All cables and wires shall be numbered with suitable ferrules.		
85	3.0. g) (viii)	(viii) Suitable lugs shall be used for control wiring and ring type lugs shall be used for all CT & PT wiring.		
86	3.0. g) (ix)	(ix) All wires shall terminate on suitable Terminal Blocks and all TBs shall have 10% spare terminals.		
87	3.0. g) (x)	(x) Each terminal blocks shall be properly marked.		
88	3.0. g) (xi)	(xi) Metallic Reinforced flexible conduit shall be used for wiring of Control & Protection compartment to VCB auxiliary contact.		
89	3.0. g) (xii)	(xii) PVC spiral shall be provided on exposed wires near the door hinge in the LT box.		
90	3.0. g) (xiii)	(xiii) Colour coding of control cables shall be followed as required by ISI. Control cables shall be approved by IS-694.		
91	3.0. g) (xiv)	(xiv) LT control cable terminations shall be through bottom cover at the front of the panel.		
92	3.0. g) (xv)	(xv) The LT control cables shall be properly shielded with detachable metallic barrier to prevent damaged during internal flashover in the panel.		

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93	3.0. g) (xvi)	(xvi) One multi-core LT cable termination box shall be provided at the Bus Coupler panel, for external 125V DC supply from DCDB and external 230V AC supply from ACDB,		
94	3.0. g) (xvii)	(xvii) In Generator Incomer Panel provision shall be kept for inter trip of Generator Incomer VCB from upstream Generator protection circuit, Also breaker auxiliary contacts shall be configured for giving status of Generator Incomer On/Off status to Generator protection circuit. Remote indication of income/ outgoing voltages, currents, power etc.		
95	3.0. g) (xviii)	(xviii) In each incomer & outgoing Feeder Panels & bus coupler panel, facilities shall be kept for local electrical close operation with synchro check/ Dead bus or feeder close permissive, local/ remote selector switch, local open, local indication for open/ close/ auto trip conditions, local indication for spring charged, local indication for trip circuit healthy status, local indication of income/ outgoing voltages, currents, power etc, local indication for trip condition etc.		
96	3.0. g) (xix)	(xix) In each income & outgoing Feeder Panel & bus coupler panel, future provision shall be kept for remote electrical close operation with synchro check / Dead bus or feeder close permissive facility, remote open, remote indication for open/ close/auto trip conditions, remote indication for spring charged and remote indication for trip circuit healthy status, status of local/ remote switch, Remote indication of income/ outgoing voltages, currents, power etc. Remote Annunciation for trip condition, Breaker spare auxiliary contacts etc.		
97	3.0. g) (xx)	(xx) Main components of Control, Protection & metering compartment shall be as follows: 1) Ammeter 2) Voltmeter 3) Energy Meter 4) Indication Lamps 5) Selector switches and push buttons 6) Protection relays 7) Internal Wiring 8) Terminal Blocks (TB)		
98	3.0. g) (xx) 1)	**1) Ammeter:**		
99	3.0. g) (xx) 1) i.	i. Ammeter to be Flush Mounted, back connected, dust proof with Industrial grade A classification and conforming to IS:1248(1968)		
100	3.0. g) (xx) 1) ii.	ii. Ammeter to be Digital, 3 ½ -digit single line or 3 line display.		
101	3.0. g) (xx) 1) iii.	iii. Ammeter Control power supply voltage to be 110V DC.		
102	3.0. g) (xx) 1) iv.	iv. Size: Suitable size		
103	3.0. g) (xx) 1) v.	v. Ammeter range shall be programmable as per CT ratio.		
104	3.0. g) (xx) 1) vi.	vi. If the Ammeter is single line display then, 1 no Ammeter selector switch to be provided for measuring load currents of all the three phases.		
105	3.0. g) (xx) 1) vii.	vii. Panels where Ammeter to be provided: All the panels except for Bus coupler		
106	3.0. g) (xx) 1) viii.	viii. Accuracy class: 0.5		
107	3.0. g) (xx) 1) ix.	ix. Ammeter Make shall be of Siemens/L&T/ Merlin-Gerin/ Schneider Electric, HPL, Indoasian/ Same as the maker of the VCB.		
108	3.0. g) (xx) 2)	**2) Voltmeter:**		
109	3.0. g) (xx) 2) i.	i. Voltmeter to be Flush Mounted, back connected, dust proof with Industrial grade A classification and conforming to IS:1248(1968)		
110	3.0. g) (xx) 2) ii.	ii. Voltmeter: Digital, 3 ½ -digit 3 line display.		
111	3.0. g) (xx) 2) iii.	iii. Voltmeter range shall be programmable as per PT ratio.		
112	3.0. g) (xx) 2) iv.	iv. Voltmeter control power supply voltage to be 110V DC.		
113	3.0. g) (xx) 2) v.	v. Size: Suitable size		
114	3.0. g) (xx) 2) vi.	vi. Voltmeter shall display line to line & line to neutral voltages of all the three phases of incomers/ outgoing feeders or bus sections.		
115	3.0. g) (xx) 2) vii.	vii. Panels where voltmeter to be provided: Incomers/ Outgoing feeders, Bus PT A & Bus PT B panel.		
116	3.0. g) (xx) 2) viii.	viii. Voltmeter of Incoming/ Outgoing panels shall be connected directly from respective feeder side PT secondary of associated unit.		
117	3.0. g) (xx) 2) ix.	ix. Voltmeter of Bus PT panels shall be connected directly from respective bus section PT secondary.		
118	3.0. g) (xx) 2) x.	x. Accuracy class: 0.5		
119	3.0. g) (xx) 2) xi.	xi. Voltmeter make shall be of Siemens/L&T/ Merlin-Gerin/ Schneider Electric, HPL, Indoasian/ Same as the maker of the VCB.		
120	3.0. g) (xx) 3)	**3) Energy meter:**		

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121	3.0. g) (xx) 3) i.	i. Panels where energy meter to be provided: All Incoming/ Outgoing panels except bus coupler and bus PTs.		
122	3.0. g) (xx) 3) ii.	ii. Each energy meters shall be of 3ph, 3 wire CT/PT operated, Microprocessor based digital multifunction TRIVECTOR energy meter with accuracy class 0.5.		
123	3.0. g) (xx) 3) iii.	iii. All the Energy meter should have RS485 port with MODBUS protocol for data logging/ downloading and Auto Meter Reader (AMR) compatible.		
124	3.0. g) (xx) 3) iv.	iv. The meter shall be of size approximately 96 mm x 96 mm.		
125	3.0. g) (xx) 3) v.	v. Energy meter should measure the following electrical parameters: Frequency, V, A, PF, KVA, KVAr, KWH, and KVAr, Cumulative On Hours, Cumulative Off Hours, Active Import Energy kWh(I), Active Export Energy kWh(F), Max of day Active & Reactive Power etc.		
126	3.0. g) (xx) 3) vi.	vi. The energy meters shall have RS-232/485/ MODBUS communication facility to connect in a network so that running & cumulative parameters can be monitored online from remote control room.		
127	3.0. g) (xx) 3) vii.	vii. Energy meter make shall be of L&T/ Merlin-Gerin/ Secure Meters (Swift Elite or eWatch 1000) / Schneider Power logic PM200 series/ HPL -Socomec (Diris A41)/ Siemens PAC3200 / Same as the maker of the VCB.		
128	3.0. g) (xx) 4)	**4) Indication Lamps:** Each VBC panel shall be provided with High intensity, clustered LED, flush mounted, insulated from 110V DC supply with appropriate coloured lens. The lens shall be made of a material, which will not be softened by the heat from the lamps. The LEDs shall be of industrial type. Indication lamps make shall be of make -Binay/ Siemens/ Tecnic / L&T / Merlin-Gerin/ Same as the maker of the VCB. Following indication lamps with colour of the LED lamps shall be provided on front panel of each VCB control cubicle: i. Breaker ON: Red ii. Breaker Off: Green iii. Spring Charged: Blue iv. Auto trip: Amber v. Service position: White vi. Test position: Green vii. Breaker Ready to Close Permissive: Blue viii. Feeder/ Bus R Phase Voltage Available: Red ix. Feeder/ Bus Y Phase Voltage Available: Yellow x. Feeder/ Bus B Phase Voltage Available: Blue xi. Trip circuit healthy: White		
129	3.0. g) (xx) 5)	**5) Selector switches and push buttons:** Selector switches and push button to be flush mounted on LV compartment door, with shrouded terminals.		
130	3.0. g) (xx) 5) i.	i. TNC Switches shall be of pistol grip type. It should be of spring return to normal position. It should be lockable having mechanical interlock to prevent accidental operation of the switch.		
131	3.0. g) (xx) 5) ii.	ii. TNC switch terminals shall be screw & nut type and indelibly marked. At least 2 nos contacts for Close and 2 nos contacts for Open should be available.		
132	3.0. g) (xx) 5) iii.	iii. Local / Remote selector switch: 6 Pole 2 way lockable and stay put type.		
133	3.0. g) (xx) 5) iv.	iv. Rotary ON/Off switches: For heater / illumination circuit to be of rating minimum 16 A.		
134	3.0. g) (xx) 5) v.	v. Push button for Relay Reset: For numerical relay reset push button shall be programmed to specified DI contact of the relay and for electro-magnetic type relays, it shall be manual flag reset type.		
135	3.0. g) (xx) 5) vi.	vi. Each breaker cubicle shall be provided with an Emergency trip push button (mechanical interlock type). The emergency push button shall be provided on front panel of the VCB to trip the breaker in case of emergencies; without opening the front cover. The Emergency trip push button shall be Red in colour and shall be protected with flaps or other suitable arrangement to prevent unintended tripping.		
136	3.0. g) (xx) 5) vii.	vii. Selector switches and push buttons make shall be of make - Siemens/ Tecnc/ L&T / Binay/ Merlin-Gerin)/ Same as the maker of the VCB.		
137	3.0. g) (xx) 6)	**6) Internal Wiring:**		
138	3.0. g) (xx) 6) i.	i. Internal wiring: 1100V grade PVC insulated stranded flexible copper wire.		
139	3.0. g) (xx) 6) ii.	ii. Control wiring and CT wiring shall be done using single core, PVC insulated FRLS (Fire Resistant Low Smoke) stranded copper cable of 1100V grade.		
140	3.0. g) (xx) 6) iii.	iii. Minimum cable size shall be 2.5 sq. mm for CT & PT circuit, and 1.5 sq. mm for control circuit, 4.0 sq. mm for Main, AC & DC Bus wirings.		
141	3.0. g) (xx) 6) iv.	iv. A suitable wiring duct system firmly, fixed on the panel and having metallic covers shall be installed for front to rear and inter panel wiring to provide easy access for inspection and replacement of the wires. It shall have sufficient clearance from High voltage system.		

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142	3.0. g) (xx) 6) v.	v. For wirings inside the relay & control panel moulded Plastic channels with covers shall be used and wires shall be suitably bunched and adequately supported to prevent sagging.		
143	3.0. g) (xx) 6) vi.	vi. Wiring between terminals of the various devices shall be point to point. Splices or tee connection will not be acceptable.		
144	3.0. g) (xx) 6) vii.	vii. Facilities for short-circuiting the current transformer secondary while the switchgear is in service shall be provided.		
145	3.0. g) (xx) 6) viii.	viii. Spare contacts of relays, breaker auxiliary contacts, CT tapings, PT tapings etc shall be wired up to the terminal blocks in the front control panel.		
146	3.0. g) (xx) 6) ix.	ix. Inter panel wiring during shipment: Inter panel wiring with ferrule to be terminated in the adjacent shipping section and shall be supplied with one end terminated and the other end bunched and coiled.		
147	3.0. g) (xx) 6) x.	x. Phase arrangement shall be: As per relevant standard.		
148	3.0. g) (xx) 6) xi.	xi. Wiring Colour code shall be as follow:		
149	3.0. g) (xx) 6) xi. a	a. PT Secondary: R ph – Red, Y Ph – Yellow, B Ph – Blue, Neutral – Black		
150	3.0. g) (xx) 6) xi b	b. CT Secondary: R ph – Red, Y Ph – Yellow, B Ph – Blue, Neutral – Black		
151	3.0. g) (xx) 6) xi. C	c. Other Control & power cables: DC – Grey, AC-Black, Earth – Green		
152	3.0. g) (xx) 7)	**7) Ferrules & Ferrule marking:** At both ends of wire with proper sized ferrule marking to be available. Ferrule type to be interlocked type. One additional red colour ferrule to be provided for all wires in trip circuit. Following marking conventions to be followed as per requirement. i. AC Circuit: H1,H2,H3 ... ii. Metering Circuit: D11,D31,D51 ... iii. O/C and E/F protection circuit : C11,C31,C51 ... iv. REF/Differential protection circuit: A11,A31,A51 ... v. Main DC distribution circuit: J1,J2,J3 ... vi. Control and protection circuit: K1,K2,K3 ... vii. Indication and annunciation circuit: L1,L2,L3 ... viii. Motor circuit: M1,M2,M3 ... ix. PT circuit: E11,E31,E51 ... x. Spare contact circuit: U1,U2,U3 ...		
153	3.0. g) (xx) 8)	**8) Cable Lugs**:		
154	3.0. g) (xx) 8) i.	i. Lugs to be used for LT cables shall be of Tinned copper, pre-insulated, fork type or ring type as applicable and as per cable size required.		
155	3.0. g) (xx) 8) ii.	ii. Lugs to be used for HT cables shall be of Tinned copper ring type as per cable size required.		
156	3.0. g) (xx) 9)	**9) Terminal Blocks (TBs**): Shall be designed for 1000V grade and minimum current rating of 10 amps. It shall be of screw type suitable for 2 nos. leads. TB shrouds & separators shall be of moulded non-inflammable plastic material.		
157	3.0. g) (xx) 9) i.	i. Terminal bocks for CT & PT secondary shall be with provision for shorting CT circuits under live system condition with screw driver operated sliding link.		
158	3.0. g) (xx) 9) ii.	ii. Isolation links shall be provided on the trip circuits, closing circuit, protection trip circuit, alarm circuit and on the PT circuits to allow easy isolation without disconnecting the wires from TBs.		
159	3.0. g) (xx) 9) iii.	iii. At least 25% spare terminals shall be provided on in each TB rows.		
160	3.0. g) (xx) 9) iv.	iv. Terminal block Clearance shall be maintained as follows:		
161	3.0. g) (xx) 9) iv. a.	a. Clearance between 2 sets of TB: 100 mm minimum.		
162	3.0. g) (xx) 9) iv. b.	b. Clearance with cable gland plate: 250 mm minimum.		
163	3.0. g) (xx) 9) iv. c.	c. Clearance between AC / DC set of TB: 100 mm minimum.		
164	4.0	**4.0 CIRCUIT BREAKER DETAILS:** Circuit Breaker shall be mounted on withdraw able truck/trolley or carriage, with locking facility in service & test positions. Racking-in and Racking-out should be such that one person can do it easily. All the VCBs for incomer, outgoing & bus coupler panels shall be of following specifications:		

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Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
165	4.0 a)	a) 11kV, Three pole, 1250 A continuous rating VCB designed for with 31.5 kA for 3 sec fault level.		
166	4.0 b)	b) VCB shall be Horizontal draw out type with Horizontal Isolation mounted on trolley with rollers.		
167	4.0 c)	c) **Trolley/ Truck :** The circuit breaker shall be mounted on an inbuilt carriage to facilitate isolation and withdrawal of the breaker. The VCB shall be either floor mounted foot roller mounted trolley type or roller mounted on sliding carriage type. If the breaker carriage is sliding type in the compartment and does not allow to complete withdrawal of the breaker outside it's compartment, then a purposely built trolley shall be provided, which should be equipped with a lowering/ raising mechanism to lower the Circuit breaker to the floor and vice versa. This operation should be capable of easily carried out by one or two person and this shall be demonstrated during FAT (if applicable). If required, one such trolley for each breaker type shall be included in the offer.		
168	4.0 d)	d) VCB trolley front cover shall be provided with two handles and cover shall be fixed to truck frame with minimum four bolts.		
169	4.0 e)	e) VCB trolley earthing shall be with self aligning flower contact.		
170	4.0 f)	f) VCB's fixed and moving contact insulators shall be epoxy cast resin type and suitable for ambient conditions mentioned in para**C** (Site Conditions).		
171	4.0 g)	g) Each breaker shall be fitted with three separate, identical single pole Vacuum bottle units and Vacuum bottles shall be fully interchangeable between the phases both electrically and mechanically.		
172	4.0 h)	h) All VCB live parts to be enclosed in epoxy resin moulds or suitable insulated partitions shall be provide between the poles & between side poles and metallic panel/ VCB enclosure.		
173	4.0 i)	i) VCB fixed & moving contact Bushings shall have suitable current rated silver coated self aligning flower contacts for firm connection.		
174	4.0 j)	j) Three separate identical single pole Vacuum bottle units shall be operated through a common or individually insulated shaft, which in turn shall be driven by the breaker operating mechanism.		
175	4.0 k)	k) Each breaker shall have provision for manually as well as electrically operated spring charging, closing and tripping.		
176	4.0 l)	l) Breaker mechanism shall be of spring charged, latched stored energy type with manual & motor operated automatic spring charging system.		
177	4.0 m)	m) Spring charge motor shall be of universal type of suitable power rating designed for 110 V DC.		
178	4.0 n)	n) One manual/ electrically operated O-C-O operation must be possible after failure of power supply to the spring charging motor.		
179	4.0 o)	o) Breaker operating mechanism shall be provided with electrical anti-pumping feature for closing.		
180	4.0 p)	p) Breaker auxiliary contacts shall have minimum 6 NO + 6NC contacts.		
181	4.0 q)	q) Each breaker shall be provided with operation counter of 5 digits, mounted on front side of the trolley and shall be clearly visible through looking glass of the front panel cover.		
182	4.0 r)	r) Breaker shall be designed for high mechanical endurance of 50,000 (minimum) operations.		
183	4.0 s)	s) Each breaker shall be provided with manual on/ off push buttons.		
184	4.0 t)	t) Mechanical type ON/OFF indication shall be provided on front side of the trolley and shall be clearly visible through looking glass of the front panel cover.		
185	4.0 u)	u) Mechanical type spring free/ charged indication shall be provided on front side of the trolley and shall be clearly visible through looking glass of the front panel cover.		
186	4.0 v)	v) Breaker positions indicator shall be provided with Service, Test/ Isolated and Withdrawal position marked.		
187	4.0 w)	w) Breaker least operating sequence shall be O -0.3 sec – CO - 3 min - CO.		
188	4.0 x)	x) **Breaker Trip and Closing Coil:** Shall be rated for operation with 110 V substation DC voltage. The breaker shall be designed for operation at minimum operating voltage of 70% for tripping and 85% for closing. Burden for Trip and Closing Coil shall be less than 200 watt for each coil.		
189	4.0 y)	y) Insulation level: Breaker shall be rated for		
190	4.0 y) (i)	(i) Rated insulation level at power frequency:28KV		
191	4.0 y) (ii)	(ii) Peak withstand voltage:75 kV		

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192	4.0 z)	z) Short time withstand current(3s): 31.5 kA		
193	4.0 aa)	aa) Rated breaking capacity: 31.5 kA (rms)		
194	4.0 bb)	bb) Rated making capacity: 78.75 kA (peak)		
195	4.0 cc)	cc) VCB shall be of low maintenance type & VCB poles shall be replaceable at site by skilled technicians.		
196	4.0 dd)	dd) Inter changeability: There shall be possible of interchange ability of VCBs, only with breaker of same rating		
197	4.0 ee)	ee) Handle: At least four hand operating device for manual charging & four handle for breaker rack in- rack out operation shall be supplied with the switchgear assembly.		
198	4.0ff)	ff) Make of the VCBs shall be Schneider / ABB/ Siemens / Crompton Greaves/ AREVA/ L&T.		
199	4.1	**4.1 Breaker Mechanical Safety interlocks** shall be provided as follows:		
200	4.1 a)	a) Not possible for circuit breaker to be either racked in-out from and to the service position unless its main contacts and auxiliary contacts are safely open.		
201	4.1 b)	b) Not possible to racking in the circuit breaker until its control plug is fully engaged.		
202	4.1 c)	c) Not possible for circuit breaker to be withdrawn from the panel, unless it is at the withdrawal position.		
203	4.1 d)	d) Disconnection of control plug shall be inhibited as long as the breaker is in service position.		
204	4.1 e)	e) Not possible for circuit breaker to be switched ON when the breaker is in any position between test and service.		
205	4.1 f)	f) The circuit breaker racking equipment should have pad lockable provision in service & test positions.		
206	4.2	**4.2 Breaker Electrical Safety interlocks** shall be provided as follows:		
207	4.2 a)	a) Electrical close/trip operation should be dependent on Local/ Remote switch. However, protection trip and emergency trip circuit should be independent of Local/ Remote Switch.		
208	4.2 b)	b) In Local: Breaker should be operable in either Service or Test position		
209	4.2 c)	c) In Remote: Provision shall be kept for operation of breaker in Remote selection only when the breaker is in Service Position.		
210	4.2 d)	d) Closing from Local: Breaker should be closed only when Local/Remote selector switch is in Local position, breaker is ready to close and Local TNC is selected to close position.		
211	4.2 e)	e) Closing from Remote: Provision shall be kept for closing from remote, only when the Local/ Remote selector switch is in remote position and Remote TNC is selected to close position.		
212	4.2 f)	f) Tripping from Local: Breaker should be tripped only when local/remote selector switch is in local position and local TNC is selected to trip position.		
213	4.2 g)	g) Tripping from Remote: Provision shall be kept for trip from remote, only when the Local/Remote selector switch in remote position and Remote TNC is selected to trip position. (Presently remote panel is not in the scope, but provision shall be kept for remote control option).		
214	4.2 h)	h) Breaker "Ready to Close Permissive" shall appear only when breaker is in test/ service position, spring is charged, no trip in Master protection relay and trip circuit is healthy.		
215	4.2 i)	i) Testing of breaker: Shall be permitted only in Test or isolated position keeping control plug connected and breaker selected in Local condition.		
216	4.2 j)	j) Protection Master Trip Relay (NO) Contact: Shall be wired directly to trip coil.		
217	4.2 k)	k) Protection Master trip relay (NC) contact: Shall be wired to inhibit closing of breaker.		
218	4.2 l)	l) Trip coil supervision: Continuous monitoring of Trip coil supervision to be given for breaker close as well as open condition in service & test position.		
219	4.2 m)	m) Each breaker panel shall have trip circuit healthy indication.		
220	5.0	**5.0 Current Transformers Details:**		
221	5.0 a)	a) CT required for metering and protection shall be as per IS-2705 & IS 4201 and shall be of adequate size and its insulation will be of epoxy cast resin type insulation class of E or better.		
222	5.0 b)	b) Type test certificate for each type of current transformers shall be submitted along with the bid.		
223	5.0 c)	c) Contact tips on primary side shall be silver plated.		
224	5.0 d)	d) Correct polarity shall be invariably marked on each primary and secondary terminal.		
225	5.0 e)	e) CT primary shall be wound or bar type, rigid, high conductivity grade copper conductor.		

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226	5.0 f)	f) Unavoidable joints on the primary side shall be bolted type, preferably lap type.		
227	5.0 g)	g) Primary Current density at any point shall not exceed 1.6 A/sq.mm.		
228	5.0 h)	h) Suitable insulated copper wire of electrolytic grade shall be used for CT secondary winding.		
229	5.0 i)	i) Multi ratio in CT shall be achieved by reconnection of secondary winding tappings.		
230	5.0 j)	j) Secondary terminal studs shall be provided with at least three nuts, two plain and two spring washers for fixing of leads.		
231	5.0 k)	k) All studs, nuts and washers shall be of brass & duly nickel plated.		
232	5.0 l)	l) The minimum outside diameter of the studs shall be 6 mm. the length of at least 15 mm shall be available on the studs for inserting the leads.		
233	5.0 m)	m) The space clearance between nuts on adjacent studs when fitted shall be at least 10 mm.		
234	5.0 n)	n) All the CTs shall be of same make.		
235	5.0 o)	o) Make of the CTs shall be Kappa/ Automatic Electricals Ltd/ Precise Electricals/ Intrans Electro Components Pvt Ltd/ Pragati Electricals/ Siemens/ L&T / Same as the maker of the VCB.		
236	5.0 p)	p) Feeder wise CT current ratios & accuracy classes shall be as follows:		
237	5.0 p) (i)	**(i) For Incomer Feeder Panel No 1, 3, 10 & 16 and outgoing feeder panel 6, 13 & 14:**		
238	5.0 p) (i) 1)	1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 1200-600/5-5 A, Short time withstand current(3s): 31.5 kA		
239	5.0 p) (i) 1) i.	i. Core – 1: Metering CT 15VA, Class-1.0,		
240	5.0 p) (i) 1) ii.	ii. Core – 2: Feeder Protection CT 15VA, Class-5P10, Accuracy Class: 0.5 suitable for over current & earth fault relay.		
241	5.0 p) (i) 2)	2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A, Short time withstand current(3s): 31.5 kA		
242	5.0 p) (i) 2) i.	i. Core – 1: Bus Differential Protection CT 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
243	5.0 p) (i) 2) ii.	ii. Core – 2: Spare Bus Differential Protection CT 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
244	5.0 p) (ii)	**(ii) For outgoing feeder panel 2, 4, 11, 12**:		
245	5.0 p) (ii) 1)	1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 600-300/5-5 A, Short time withstand current(3s): 31.5 kA.		
246	5.0 p) (ii) 1) i.	i. Core – 1: For Metering, 15VA, Class-1.0,		
247	5.0 p) (ii) 1) ii.	ii. Core – 2: For Feeder Protection, 15VA, Class-5P10, Accuracy Class:0.5 suitable for over current & earth fault relay.		
248	5.0 p) (ii) 2)	2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A Short time withstand current(3s): 31.5 kA		
249	5.0 p) (ii) 2) i.	i. Core – 1: For Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
250	5.0 p) (ii) 2) ii.	ii. Core – 2: For spare Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
251	5.0 p) (iii)	**(iii) For Generator Incomer Feeder Panel No 5 & 15:**		
252	5.0 p) (iii) 1)	1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 1200/5-5 A, Short time withstand current(3s): 31.5 kA		
253	5.0 p) (iii) 1) i.	i. Core – 1: Metering CT 15VA, Class-1.0,		
254	5.0 p) (iii) 1) ii.	ii. Core – 2: Generator Differential Protection CT 15VA, Class-5P10, 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
255	5.0 p) (iii) 2)	2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A, Short time withstand current(3s): 31.5 kA.		
256	5.0 p) (iii) 2) i.	i. Core – 1: Bus Differential Protection CT 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
257	5.0 p) (iii) 2) ii.	ii. Core – 2: Spare Bus Differential Protection CT 15VA, Class-5P10, Accuracy class:0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
258	5.0 p) (iv)	**(iv) For Bus CTs of Panel 7 & 9 (for Bus Section A & B respectively)**:		
259	5.0 p) (iv) 1)	1) For Metering & Protection: In each panel 3 nos dual core CTs of ratio: 1200/5-5 A, Short time withstand current(3s): 31.5 kA.		
260	5.0 p) (iv) 1) i.	i. Core – 1: For Metering, 15VA, Class-1.0,		
261	5.0 p) (iv) 1) ii.	ii. Core – 2: For Feeder Protection, 15VA, Class-5P10, Accuracy Class: 0.5 suitable for over current & earth fault relay.		
262	5.0 p) (iv) 2)	2) For Bus Differential Protection: In each panel 3 nos dual core CTs of ratio: 1600/5-5 A Short time withstand current(3s): 31.5 kA.		
263	5.0 p) (iv) 2) i.	i. Core – 1: For Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		

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264	5.0 p) (iv) 2) ii.	ii. Core – 2: For Spare Bus Differential Protection, 15VA, Class-5P10, Accuracy class: 0.5, Vk>= 400V, Rct, 12 ohms (approx.), Im= 30 mA (approx.) at Vk/2.		
265	6.0	**6.0 Potential Transformer Details:**		
266	6.0 a)	a) Each incoming/ outgoing feeder panels (panel no 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16) should be provided with 3 nos single phase PTs or 3 phase single unit type PT scheme.		
267	6.0 b)	b) Bus Section A & B (panel no 7 & 9) should be provided with Bus PTs each having 3 nos single phase PTs or 3 phase single unit type PT scheme.		
268	6.0 c)	c) All the PTs shall be of ratio 11kV (L-L) / 110V (L-L), burden – 100 VA, Accuracy class - 0.5 as per IS 3156 (Part I, II, III).		
269	6.0 d)	d) Type test certificate for each type of Voltage transformers shall be submitted along with the bid.		
270	6.0 e)	e) All the PTs shall be of same make and shall be of cast resin type with insulation class of E or better.		
271	6.0 f)	f) PT primary & secondary star point shall be connected to earth in service position and indicated by bidder in relevant drawing.		
272	6.0 g)	g) Contact tips of primary/secondary contacts shall be silver plated.		
273	6.0 h)	h) Correct polarity shall be distinctly marked on PT primary and secondary terminal.		
274	6.0 i)	i) Each PTs shall be provided HRC fuse on HT primary side & MCB/ fuses on secondary LT side. HT HRC fuses shall be of make GE, Siemens, L&T, Schneider, Cooper Bussman.		
275	6.0 j)	j) Secondary terminal studs shall be provided with at least three nuts, two plain and two spring washers for fixing leads.		
276	6.0 k)	k) The stud, nuts and washers shall be of brass, duly nickel plated.		
277	6.0 l)	l) The minimum outside diameter of the studs shall be 6 mm. the length of at least 15 mm shall be available on the studs for inserting the leads.		
278	6.0 m)	m) The space clearance between nuts on adjacent studs when fitted shall be at least 10 mm.		
279	6.0 n)	n) All the PTs shall be of same make.		
280	6.0 o)	o) Make of the PTs shall be Kappa/ Automatic Electricals Ltd/ Precise Electricals/ Intrans Electro Components Pvt Ltd/ Pragati Electricals/ Siemens/ L&T / Same as the maker of the VCB.		
281	7.0	**7.0 CONTROL SUPPLY:**		
282	7.0 a)	a) The switchgear shall be designed to operate at 110 V DC. Control power supply for the new switchgear shall be provided from existing 110 V DC, 300 AmpHr battery bank with its dedicated float cum boost battery charger.		
283	7.0 b)	b) 110V DC Control supply and 230 V AC supply from OIL's source shall be supplied in the bus coupler panel only.		
284	7.0 c)	c) In bus coupler panel, AC & DC healthy indication should be available.		
285	7.0 d)	d) New switchgear should have properly insulated internal bus to carry DC & AC power to all other panels as required.		
286	7.0 e)	e) In each cubicle isolating fuses / MCBs shall be provided for incoming AC/ DC supplies.		
287	7.0 f)	f) In each cubicle isolating fuses with links shall be provided for breaker close, breaker trip, spring charge, protection trip and indication circuits.		
288	8.0	**8.0 EARTHING:** Circuit Breaker and metal enclosure shall be earthed in accordance with latest IS published by BIS (IS-2516, part-1, section-1). The switchgear cubicles shall be provided with minimum two proper sized earthing terminals (one at both ends) for connection to existing earth strips, connected to dedicated earth electrodes.		
289	8.0 a)	a) Material of Earthing Bus: An Earth bus rated to carry maximum fault current for 3 second shall be furnished along the full length of the panel board. The earth bus shall be of copper and shall have adequate cross sectional area. All bolted joints in the Earth bus will be secured by connection of minimum two nos zinc passivated nut bolts / stainless steel nuts & bolts with heavy duty flat and spring washers. Bolt dia shall be minimum 15mm.		
290	8.0 b)	b) Earthing Conductors: The earthing bus shall be connected to exiting earthing grid of the substation with two separate earthing conductors. Earthing conductors shall be of annealed high conductivity stranded Copper in accordance with Table-4 in BS.6346 and protected with an extruded PVC sheath of 1100 volt grade. The earthing conductor shall be adequate to carry the rated switchgear short-circuit current of 31.5kA for 3 second.		
291	8.0 c)	c) Connections to earthing bus: Two separate earthing terminals shall be provided in each cubicle and shall be connected to the earth bus within the panel.		
292	8.0 c) (i)	(i) All enclosure and non-current carrying part of the switchboard/components shall be effectively bonded to the earth bus.		
293	8.0 c) (ii)	(ii) All Hinged doors shall be effectively earthed through flexible copper braid.		

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294	8.0 c) (iii)	(iii) Earthing connection between the VCB trolley/ carriage and cubicle shall be provided by means of proper sized, self aligning sliding contact. The VCB trolley/ carriage should be arranged in such a way that all the non current carrying metallic parts of the trolley are kept earthed in the isolated position as well as when the trolley is inserted from the isolated position to the service position. Similarly while the truck is being withdrawn, the earthing connection shall not be interrupted until the truck has moved past the isolated position. Also the VCB trolley/ carriage shall be earthed before control circuit contacts are plugged in the associated stationary contacts.		
295	8.0 c) (iv)	(iv) Metallic cases of relays, instruments and other LT panel mounted equipments shall be connected to the earth bus by independent copper wires of size not less than 2.5 sq mm with green colour insulation. For this purpose LT compartment should have a clear designated earth bus to which earth connections from all components are to be connected.		
296	8.0 c) (v)	(v) CT & PT neutrals shall be earthed at the front panel terminal blocks through removable testing links.		
297	9.0	**9.0 Annunciation & Facia panel:**		
298	9.0 a)	a) There shall be one Alarm Annunciation & Facia indication panel with hooter acknowledge and reset facility.		
299	9.0 b)	b) This shall raise alarm indication & hooter whenever any feeder trips on fault or other abnormal conditions arises such as PT fuse failure, Bus zone protection operated, Bus wire supervision fault, panel AC & DC control supply problem etc.		
300	9.0 c)	c) This Annunciation panel shall be located at the bus coupler panel or bus adapter panels.		
301	10.0	**10.0 Synchronoscope & two lamp method:**		
302	10.0 a)	a) There shall be Synchronoscope & two dark lamp type check synchronizing system located at Bus coupler control panel or bus adapter panel.		
303	10.0 b)	b) PT circuits of all incomer & outgoing feeder, bus coupler shall be connected to one analogue or digital type synchronoscope (12 O'clock position type) & two dark lamp method type synchro check facility; to facilitate feeders to close for paralleling.		
304	10.0 c)	c) There shall be a selector switch to ON/OFF the synchronization scheme.		
305	10.0 d)	d) There shall be a selector switch so that only one feeder is selected at a time for synchronization with running bus.		
306	10.0 e)	e) Also in case of dead bus or dead feeder selection, provision shall be there to close the breaker in such case.		
307	11.0	**11.0 PROTECTION SCHEMES:**		
308	11.0 a)	a) Protection CTs of each incomer/ outgoing feeder shall be residually connected to detect three phase over current & earth faults.		
309	11.0 b)	b) Bidder shall provide similar make relays only in all the panels.		
310	11.0 c)	c) **Incommer/ Outgoing feeder Protection:** Each incomer/ outgoing feeder panels (panel no. 1, 2, 3, 4, 6, 10, 11, 12, 13, 14, 16) shall have single numerical relay with following protections/ features:		
311	11.0 c) (i)	(i) Definite-Time Non directional 3 phase Overcurrent Protection (50, 50(N))		
312	11.0 c) (ii)	(ii) Time- over current protection(51,51N) (programmable for IEC/ IEEE IDMTL curves)		
313	11.0 c) (iii)	(iii) Overload protection(49)		
314	11.0 c) (iv)	(iv) Under/Overvoltage protection from feeder PTs (27/59)		
315	11.0 c) (v)	(v) Under/Over frequency protection from feeder PTs (81 O/U)		
316	11.0 c) (vi)	(vi) Breaker failure protection(50BF)		
317	11.0 c) (vii)	(vii) Phase unbalance or negative sequence protection(46)		
318	11.0 c) (viii)	(viii) Trip circuit supervision(74TC)		
319	11.0 c) (ix)	(ix) Synchrocheck facility for paralleling of feeders with respective bus sections.		
320	11.0 c) (x)	(x) Fault recorder(25)		
321	11.0 c) (xi)	(xi) Disturbance recorder(5)		
322	11.0 c) (xii)	(xii) Events recorder(250)		
323	11.0 c) (xiii)	(xiii) Each numerical relays shall have RS-232/485/ MODBUS as per IEC 61850 communication facility to connect in a network so that running parameters, disturbance records can be monitored and relay settings can be changed online from remote control room.		
324	11.0 c) (xiv)	(xiv) Each numerical relay shall have minimum 16 programmable Digital input slots for monitoring breaker open/ close, breaker test/ service, breaker spring charge etc. and minimum 8 programmable Digital outputs for Breaker Ready To close, Trip circuit Healthy, Breaker Protection trip etc.		

TECHNICAL EVALUATION SHEET FOR TECHNICAL SPECIFICATIONS/ SCOPE OF WORK **ANNEXURE- II**

Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
325	11.0 c) (xv)	(xv) Each numerical relay shall be suitable for relay auxiliary power of 110 V DC.		
326	11.0 c) (xvi)	**(xvi) Successful bidder (supplier) shall supply all software necessary for monitoring/ configuration of the numerical relays.**		
327	11.0 c) (xvii)	(xvii) Make: Make & type of numerical relays shall be of ABB (Type REB611/ Similar to REF615 or above)/ SEL (Type SEL-751)/ Siemens(Type Siprotec 7SJ80) / Areva T&D India Ltd (Schneider Group) (Type Micom- P123/ P127, Micom Alstom P40).		
328	11.0 d)	d) **Directional Bus Over current Backup Protection Relay**: Bus PT, Bus CT cum Bus Adapter Panels 7 & 9 shall have two nos numerical relays with following protections/ features for providing back up Directional bus over current protection. These two relay should trip all the feeders in their respective sections (via Master trip relay circuit of individual panels) in the event of occurrence of bus fault condition.		
329	11.0 d) (i)	(i) Directional over current(67,67N) (to check bus fault on other section)		
330	11.0 d) (ii)	(ii) Time -over current protection(50,50N,51,51N) (programmable for IEC/ IEEE IDMTL curves)		
331	11.0 d) (iii)	(iii) Overload protection(49)		
332	11.0 d) (iv)	(iv) Under/Overvoltage protection from Bus PT((27/59)		
333	11.0 d) (v)	(v) Under/Over frequency protection from Bus PT((81 O/U)		
334	11.0 d) (vi)	(vi) Breaker failure protection(50BF)		
335	11.0 d) (vii)	(vii) Phase unbalance or negative sequence protection(46)		
336	11.0 d) (viii)	(viii) Trip circuit supervision(74TC)		
337	11.0 d) (ix)	(ix) Synchrocheck facility for paralleling of bus section A & B		
338	11.0 d) (x)	(x) Fault recorder(25)		
339	11.0 d) (xi)	(xi) Disturbance recorder(5)		
340	11.0 d) (xii)	(xii) Events recorder(250)		
341	11.0 d) (xiii)	(xiii) Each numerical relays shall have RS-232/485/ MODBUS as per IEC 61850 communication facility to connect in a network so that running parameters, disturbance records can be monitored and relay settings can be changed online from remote control room.		
342	11.0 d) (xiv)	(xiv) Successful bidder (supplier) shall supply all software necessary for monitoring/ configuration of the numerical relays.		
343	11.0 d) (xv)	(xv) Make: Make & type of numerical relays shall be of ABB (Type REB611/ Similar to REF615 or above)/ SEL (Type SEL-751 & SEL-311)/ Siemens(Type Siprotec 7SJ80 & 7SD80) / Areva T&D India Ltd (Schneider Group) (Type Micom- P123/ P127, Micom Alstom P40).		
344	11.0 e)	**e) Bus Differential Protection:**		
345	11.0 e)(i)	(i) Circulating current based high impedance bus differential protection shall be provided on each section A & B.		
346	11.0 e) (ii)	(ii) All the panels of Bus Section A of the new switchgear shall be under Bus Section A differential protection and similarly all the panels of Bus Section B shall be under Bus Section B differential protection.		
347	11.0 e) (iii)	(iii) The zone of protection of A & B section shall overlap in the bus coupler panel.		
348	11.0 e) (iv)	(iv) Bus differential system In/Out selector switch shall be provided to facilitate bypass of the bus differential protection scheme for maintenance or other operational issues.		
349	11.0 e) (v)	(v) Bus differential relay should trip all the feeders in their respective sections (via Master trip relay circuit of individual panels) in the event of occurrence of bus fault condition.		
350	11.0 e) (vi)	(vi) Suitable stabilizing resistor and Metrosils shall be provided with the bus differential protection scheme to mitigate CT dissimilarities and saturation during fault conditions.		
351	11.0 e) (vii)	(vii) Bus wire CT supervision relay shall be provided to monitor the healthiness of the Bus Differential Protections of each section.		
352	11.0 e) (vii)	(viii) In the event of unbalance in CT circuit during normal operation, same shall give an audible & flashing alarm.		
353	11.0 e) (ix)	(ix) Make: Make & type of relays shall be of as follows:		
354	11.0 e) (ix) 1)	1) For Bus Differential Protection Relay: Make & type of numerical relays shall be of ABB (Type REB611/ Similar to REF615 or above)/ SEL (Type SEL-751 & SEL-311)/ Siemens(Type Siprotec 7SJ80 & 7SD80) / Areva T&D India Ltd (Schneider Group) (Type Micom- P123/ P127, Micom Alstom P40).		
355	11.0 e) (ix) 2)	2) For Bus wire CT supervision Relay: Alstom (Type- MVTP), Areva type VTX31 or equivalent.		

TECHNICAL EVALUATION SHEET FOR TECHNICAL SPECIFICATIONS/ SCOPE OF WORK **ANNEXURE- II**

Technical Specifications for 16 nos 11 KV Indoor Type Panels (6 nos Incomer Feeders, 7 nos Outgoing Feeders, 1 no Bus Coupler and 2 nos Bus PT, Bus CT cum Bus Adapter Panels)

SL No:	Clause no of Tender BRC	Description	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of their Bid to support the remarks/ compliance
356	11.0 f)	f) **Master protection relay:**		
357	11.0 f) (i)	(i) There shall be one master trip protection relay in each incommer, outgoing and bus coupler panel.		
358	11.0 f) (ii)	(ii) This relay shall be of manually reset type.		
359	11.0 f) (iii)	(iii) Whenever the individual feeder protection relay operates due to fault on the feeder, the master trip relay of the respective panel should trip the breaker.		
360	11.0 f) (iv)	(iv) Similarly whenever bus zone protection of a particular zone operates due to fault, all the master protection relays of the panels of the affected zone should operate simultaneously and trip their respective breaker panels.		
361	11.0 f) (v)	(v) Make: Make & type of relays shall be of Alstom High Speed Tripping Relay VAJH or equivalent		
362	11.0 g)	**g) PT Fuse failure relay:**		
363	11.0 g) (i)	(i) Each Bus PTs & Feeder PTs shall be provided with fuse failure protection.		
364	11.0 g) (ii)	(ii) This scheme shall give alarm indication and raise hooter whenever PT primary or secondary fuse gets blown.		
365	11.0 g) (iii)	(iii) In such case; all the voltage based protections of the affected portion, shall be bypassed automatically.		
366	11.0 g) (iv)	(iv) The relay shall be separate one or inclusive in the Feeder protection numerical relay.		
367	11.0 g) (v)	(v) Make: Make & type of relays shall be of Alstom Fuse Failure Relay VAPM31 or equivalent.		
368	11.0 h)	**h) Control AC/ DC healthy check relay:**		
369	11.0 h) (i)	(i) There shall be one control 230V AC healthy check relay and one 110V DC healthy check relay located in the bus coupler panel to monitor panel AC & DC power healthiness.		
370	11.0 h) (ii)	(ii) This should give alarm indication as well as raise hooter; whenever the other supply is facing trouble.		
371	11.0 i)	**i) Differential Protection of Generator Incommer Feeder:** The proposed panel no 5 & 15 shall be used as Generator incomer from 2x 14.45 Mw Gas Turbines Unit#1 & #2 respectively. These two panels shall have provision for 3 phase generator differential CTs of rating 1200/5-5 A in each panel. Separate differential relays are not required as the existing Generator differential relays will be connected to these panels.		

TECHNICAL EVALUATION SHEET FOR SPECIAL TERMS & CONDITIONS OF THE TENDER **ANNEXURE- I**

SL NO:	Special Terms & Conditions of the Tender:	Bidders Remarks Complied/ Not Complied/ Deviation	Bidder to indicate Relevant Page No of
1	Bidder shall be a panel manufacturer/channel partner/ authorized dealer of 11KV switchgear panel with Vacuum Circuit Breaker (VCB). Bidders quoting on behalf of OEM shall submit copy of valid dealership certificate/ authorization letter/ certificate of channel partnership from the OEM along with the offer.		
2	The bidder or their OEM shall have experience in design, manufacturing, testing, supply, installation and commissioning of minimum 1 set of 11KV switchgear panel with Vacuum Circuit Breaker (VCB), CTs, PTs, protection relays, indicating & measuring instruments in any Central Govt./Govt. PSU/Public Limited Companies during last 5 years as on bid closing date of this tender. Bidders quoting on behalf of OEM shall submit either their own or OEM's credentials such as PO copies with invoice/ performance certificate/ completion certificate/ commissioning report in design, manufacturing, supply and commissioning of panels.		
3	It is essential for OIL to remove the old panels from the installation by the bidder, for which a buy back system is incorporated.It is therefore mandatory for the bidders to quote against buy back of the old panels on "as-is-where-is" basis.		
4	In work schedule, buyback is incorporated and essential to be filled up by bidders. The quoted buy back price for the old panels shall be deducted from the total price against work schedule, i.e., supply + dismantling, installation & commissioning. Details of the buy-back arrangement are given in the clause "Buy Back Arrangement" of Header Notes.		
5	As bidder has to buy back old panel, bidder shall offer prices for both new switchgear panel as well as buy back price of old switchgear panel. Offers will be evaluated taking into account buy-back prices of old panel.		
6	In case of identical lowest offered rate by more than 1 (one) bidder, purchase order will be awarded on the basis of draw of lots between the parties offering the same lowest price.		
7	Bidders are advised not to indicate any separate discount. Discount if any, should be merged with the quoted offer. Discount of any type indicated separately will not be taken into account for evaluation purpose. However, in the event such offer without considering discount is found to be lowest, OIL shall avail such discount at the time of award of purchase order.		
8	Timely submission of the bids is the responsibility of the Bidder. Bid should be submitted before the bid closing date and time. Company (OIL) shall not be responsible for any delay and company will not entertain any correspondence in this regard.		
9	Bidder shall submit the bid, duly completed in terms of all the Bid Documents required.		
10	In case bidder takes exception to any clause of Tender Document, then OIL has the discretion to load or reject the offer on account of such exception, if the bidder does not withdraw / modify the deviation when / as advised by OIL. The loading so done by OIL will be final and binding on the Bidders.		
11	Priced bids of only those bidders will be opened whose offers are found technically acceptable. The technically acceptable bidders will be informed before opening of the "priced bid".		
12	To ascertain the substantial responsiveness of the bid, the Company reserves the right to ask the Bidder for clarification in respect of clauses covered under this tender.		
13	The originals of documents [furnished by bidders(s)] shall have to be produced by the bidder(s) to OIL as and when asked for.		

ANNEXURE- IV

DATA SHEET
(To be filled by the bidder)

A. **DETAILS OF 11KV VCB PANELS**:

Sl. No.	Particulars	Bidders Remarks
1	Name of manufacturer :	
2	Manufacturer's Panel Type/Model No. :	
3	Panel type: (Vertical separation & Horizontal isolation or Horizontal separation & Horizontal isolation)	
4	Degree of protection :	
5	Panel Fully Type tested : Yes/No.	
6	Type tested at: (Specify lab/Institution where test was carried out)	
7	Panel Conforms to (Standards): a) IEC : b) BIS : c) Others :	
8	Rated Insulation: a) Min. withstand voltage :	
	b) Impulse voltage withstand (dry) :	
9	General details of Panels: a) Extensible : Yes/No.	
	b) Compartmentalized : Yes/No	
	c) No. of compartments :	
	d) Names of the compartments (To be indicated)	
	e) Material of internal partitions:	
10	Thickness of Panel Sheet metal: a) Doors, internal partitions & side covers: b) Top Cover: c) Bottom covers: d) Cable gland plates:	 a) b) c) d)
11	Bus bar Design: a) Busbar material : b) Busbar shap : c) Busbar size : d) Busbar insulation type & materials : e) Busbar rating (Amps) : f) Busbar Spouts insulation material : g) Busbar support insulation type & materials :	 a) b) c) d) e) f) g)
12	Guaranteed maintenance free life of a) Panels : b) Circuit breaker :	 a) b)
13	Operational safety interlocks provided (To be indicated) a) b) c)	 a) b) c)
14	Circuit breaker cubicle with front plate/door pressure tested for internal arc faults : Yes/No	

15	Panel Wiring: a) Voltage rating : b) Insulation type & material : c) Wire size	 a) b) c)
16	Rated control power voltage:	
17	Indication & Annunciation supply voltage	
18	Panel Designed for Environmental Conditions: a)Maximum Ambient air temperature : b)Minimum Ambient air temperature : c)Maximum humidity at site (at 40 º C) d)Surrounding atmospheric condition :	 a) b) c)
19	Confirm that Panel, Light space heater will be provided: (Yes/ No)	
20	Confirm that insulation provided is suitable for above environmental conditions: Yes/No	

B. **VACUUM CIRCUIT BREAKER:**

(Information to be given as per IS: 13118: 1991 Clause 9.012)

Sl. No.	**Particulars**	**Bidders Remarks**
1	Name of manufacturer :	
2	Manufacturer's VCB Type/Model No. :	
3	Rated Values and Characteristics	
	a) Number of Poles:	
	b) Class: Indoor/Outdoor Temperature rating:	
	c) Rated voltage:	
	d) Frequency of operation:	
	e) Rated insulation level:	
	f) Rated frequency:	
	g) Rated normal current :	
	h) Rated line charging breaking current:	
	i) Rated cable charging breaking current:	
	j) Rated small inductive breaking current:	
	k) Rated Short Circuit breaking current:	
	l) First pole to clear factor:	
	m) Rated Transient Recovery voltage for terminal faults:	
	n) Rated characteristics for short line faults:	
	o) Rated Short Circuit making current:	
	p) Rated Operating sequence:	
	q) Rated out of phase breaking current :	
	r) Rated opening time :	
	s) Rated breaking time:	
	t) Rated closing time:	
	u) Breaker fixed & moving contact insulator - Material:	
	v) Number and type of spare contacts available in breaker auxiliary switch:	
	w) Closing coil- Normal voltage : Min. voltage : Max. voltage :	

	x) Trip coil - Normal voltage : Min. voltage : Max. voltage :	

C. **CURRENT TRANSFORMERS OF SWITCHGEAR PANEL:**

Sl. No.	**For Panel no.**	**Particulars**	**Metering & Feeder Protection CT**		**Bus Differential CT**
		No of Cores & Purpose	**Core 1**	**Core 2**	**Core 1 & 2**
			For Metering Purpose	**For Phase Over current & Residual earth Fault**	**For Bus Differential Protection**
1	1, 3, 6, 10, 13, 14 & 16	Required CT Ratio	1200-600A/ 5-5A	1200-600A/ 5-5A	1600A/ 5-5A
		i) Make:			
		ii) Type:			
		iii) Class:			
		iv) Burden (VA:			
		v) No. of cores (Secondary):			
2	2, 4,11 &12	Required CT Ratio	600-300A/ 5A	600-300A/ 5A	1600A/ 5A
		i) Make:			
		ii) Type:			
		iii) Class:			
		iv) Burden (VA):			
		v) No. of cores (Secondary):			
3	5, 15 Generator Incommer Panels	Required CT Ratio	1200A/ 5-5A	1200A/ 5-5A	1600A/ 5-5A
		i) Make:			
		ii) Type:			
		iii) Class:			
		iv) Burden (VA:			
		v) No. of cores (Secondary):			
4	For Bus BT, Bus CT cum Bus Adapter Panel 7 & 9	Required CT Ratio	1200/ 5-5A	1200/ 5-5A	1600A/ 5-5A
		i) Make:			
		ii) Type:			
		iii) Class:			
		iv) Burden (VA):			
		v) No. of cores (Secondary):			

D. **VOLTAGE TRANSFORMERS OF SWITCHGEAR PANEL**:

Sl. No.	**For Panel no.**	**Particulars**	**Bidders Remarks**
1	1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16	Incomer/ Outgoing Feeder PT	
		i) Make :	
		ii) Type :	
		iii) Class :	
		iv) Ratio :	
		v) Burden (VA) :	
		vi) No. of phases :	

		vii) No. of cores (Secondary):	
		viii) Location/Mounted on :	
		ix) Fixed/ Withdraw able :	
		x) Primary side protection :	
		xi) Secondary side protection:	
2	For Bus BT, Bus CT cum Bus Adapter Panel 7 & 9	Bus PT	
		i) Make :	
		ii) Type :	
		iii) Class :	
		iv) Ratio :	
		v) Burden (VA) :	
		vi) No. of phases :	
		vii) No. of cores (Secondary):	
		viii) Location/Mounted on :	
		ix) Fixed/ Withdraw able :	
		x) Primary side protection :	
		xi) Secondary side protection:	

E. Panel Auxiliaries:

Sl. No.	Particulars	Bidders Remarks
1	**CONTROL CABLES (for Control, Protection & Metering):**	
	a) Make:	
	b) Voltage Grade:	
	c) Insulation:	
	d) Conductor Material:	
	e) Size (Sq. mm. per core):	
2	**AMMETER** : For Panel No: 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16	
	a) Make :	
	b) Class :	
	c) Ratio :	
	d) display:	
	e) Range:	
	f) Control supply required:	
3	**Voltmeter:** For Panel No: 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16	
	a) Make :	
	b) Class :	
	c) Ratio :	
	d) display:	
	e) Range:	
	f) Control supply required:	
4	**Energy Meter:** For Panel No: 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16	
	a) Make :	
	b) 3ph, 3 wire CT/PT operated :	Yes/ No
	c) Required CT & PT Ratio :	
	d) Display:	
	e) Energy meter should measure the following electrical parameters: Frequency, V, A, PF, KVA, KVAr, KWH, and KVAr, Cumulative On Hours, Cumulative Off Hours, Active Import Energy kWh(I), Active Export Energy kWh(F), Max of day Active & Reactive Power.	Yes/ No
	f) Control supply required:	

	g) Communication facility:	
5	**SELECTOR SWITCHES** : For Voltmeter/ Ammeter, Local/ Remote etc.	
	a) Make:	
	b) Type:	
	c) No of NO/NC contacts	
	d) Control supply required:	
6	**TNC SELECTOR SWITCHES** : For Voltmeter/ Ammeter, Local/ Remote etc.	
	a) Make:	
	b) Type:	
	c) No of NO/NC contacts	
	d) Control supply required:	
7	**HT Cable Termination Kit for 1C x 400 sqmm**	
	a) Voltage grade	
	b) For Cable Type Cross linked polyethylene (XLPE), Armoured	Yes / No
	c) Type of kit	Indoor/ Outdoor
	d) Shelf life	
	e) Make	
8	**HT Cable Termination Kit for 3C x 240 sqmm**	
	a) Voltage grade	
	b) For Cable Type Cross linked polyethylene (XLPE), Armoured	Yes / No
	c) Type of kit	Indoor/ Outdoor
	d) Shelf life	
	e) Make	
9	**HT Cable Termination Kit for 3C x 120 sqmm**	
	a) Voltage grade	
	b) For Cable Type Cross linked polyethylene (XLPE), Armoured	Yes / No
	c) Type of kit	Indoor/ Outdoor
	d) Shelf life	
	e) Make	

F. **PROTECTIVE RELAY:**

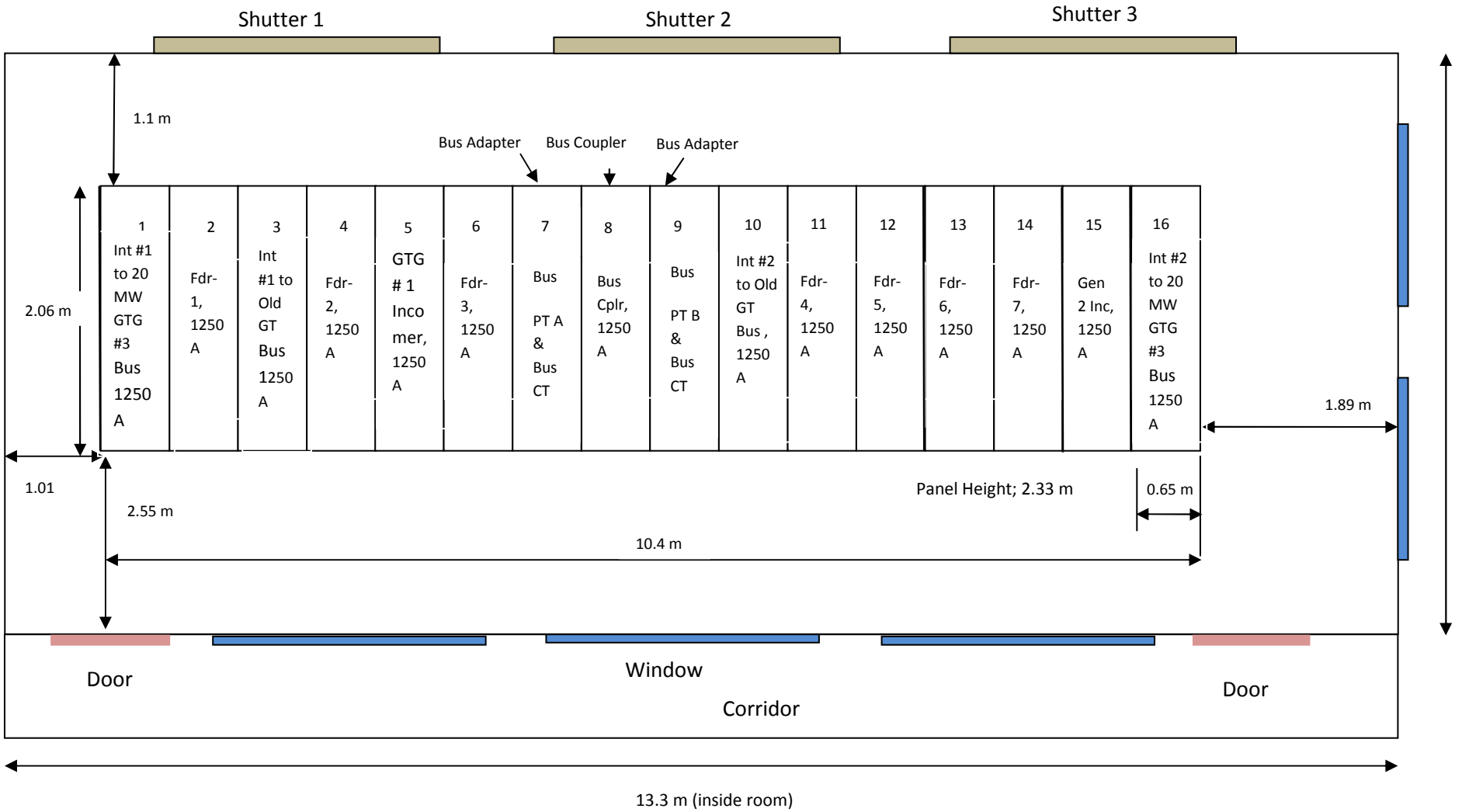
Sl. No.	**For Panel no.**	**Particulars**	**Bidders Remarks**
1	1, 2, 3, 4, 6, 10, 11, 12, 13, 14, 16	**Incommer/ Outgoing feeder Protection Relay**	
		i) Make :	
		ii) Type/ Model :	
		iii) Burden (VA) :	
		iv) No. of phases :	
		v) Location/Mounted on :	
		vi) Protection features:	
		vii) Fault recorder, Disturbance recorder, Events recorder available (Yes /No)	
		viii) Control supply required:	
		ix) Communication facility:	
		x) No of programmable Digital input/ output channels:	
2	7 & 9	**Directional Bus Over current Backup Protection Relay**	
		i) Make :	
		ii) Type/ Model :	
		iii) Burden (VA) :	
		iv) No. of phases :	
		v) Location/Mounted on :	
		vi) Protection features:	

		vii) Fault recorder, Disturbance recorder, Events recorder available (Yes /No)	
		viii) Control supply required:	
		ix) Communication facility:	
		x) No of programmable Digital input/ output channels:	
3	Covering All Panels in Bus Section A & Bus Section B	**Differential Protection Relay for Bus Section A & Bus Section B**	
		i) Make :	
		ii) Type/ Model :	
		iii) Burden (VA) :	
		iv) No. of phases :	
		v) Location/Mounted on :	
		vi) Protection features:	
		vii) Fault recorder, Disturbance recorder, Events recorder available (Yes /No)	
		viii) Control supply required:	
		ix) Communication facility:	
		x) No of programmable Digital input/ output channels:	
4	1, 2, 3, 4, 5, 6, 8 10, 11, 12, 13, 14, 15, 16	**Master protection relay**	
		i) Make :	
		ii) Type/ Model :	
		iii) Burden (VA) :	
		iv) No. of phases :	
		v) Location/Mounted on :	
		vi) Protection features:	
5	Covering All Panels in Bus Section A & Bus Section B	**CT supervision relay for Bus Differential Scheme**	
		i) Make :	
		ii) Type/ Model :	
		iii) Burden (VA) :	
		iv) No. of phases :	
		v) Location/Mounted on :	
		vi) Protection features:	
6	1, 2, 3, 4, 5, 6, 7, 9 10, 11, 12, 13, 14, 15, 16	**PT Fuse failure relay**	
		i) Make :	
		ii) Type/ Model :	
		iii) Burden (VA) :	
		iv) No. of phases :	
		v) Location/Mounted on :	
		vi) Protection features:	
7	Bus Coupler Panel 8	**Control AC healthy check relay:**	
		i) Make :	
		ii) Type/ Model :	
		iii) Location/Mounted on :	
		iv) Protection features:	
8	Bus Coupler Panel 8	**Control DC healthy check relay:**	
		i) Make :	
		ii) Type/ Model :	
		iii) Location/Mounted on :	
		iv) Protection features:	

ANNEXURE- VII

Individual Panel Width = Minimum 650mm

PROPOSED LAYOUT OF 11KV HT SWITCHGEAR – 1600A

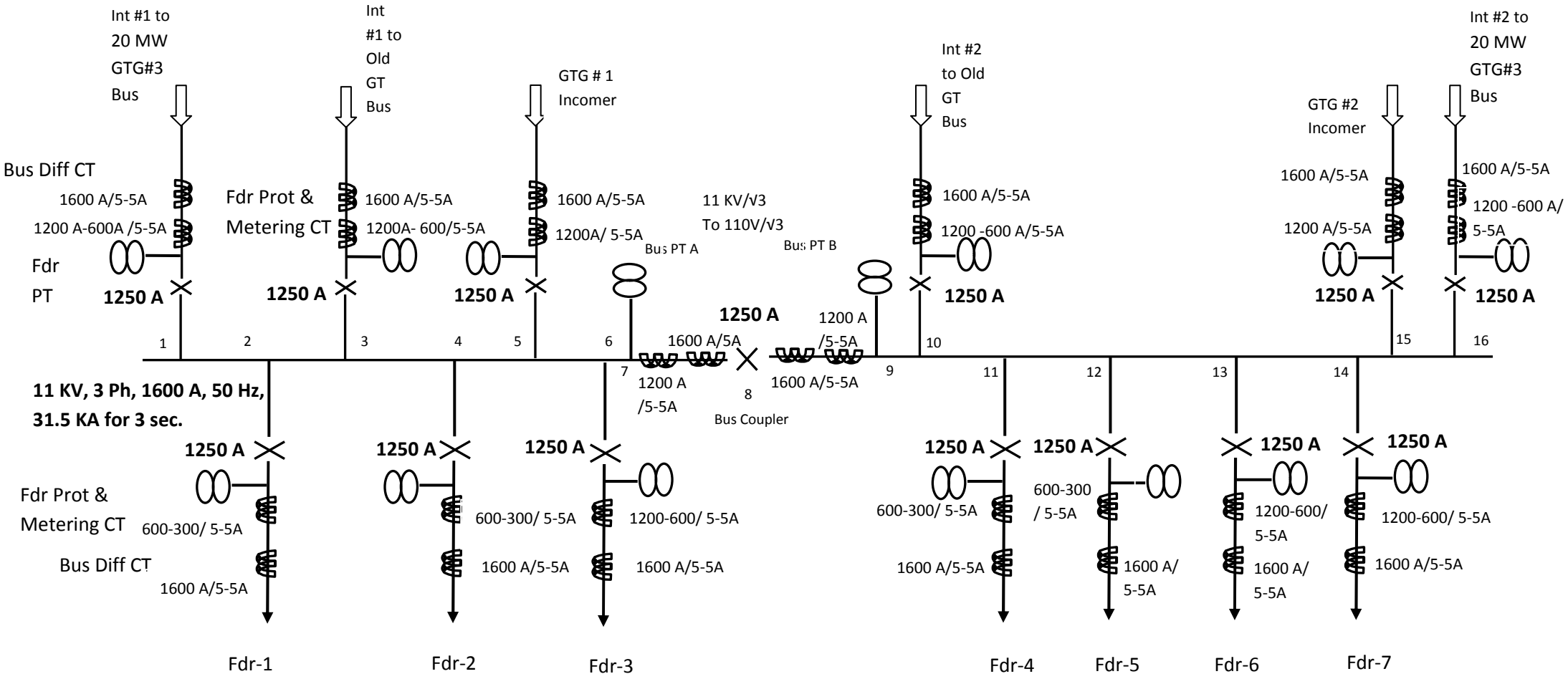


NB: Drawing not to scale

ANNEXURE- VI

SCHEMATIC DIAGRAM OF PROPOSED 11KV HT SWITCHGEAR – 1600A

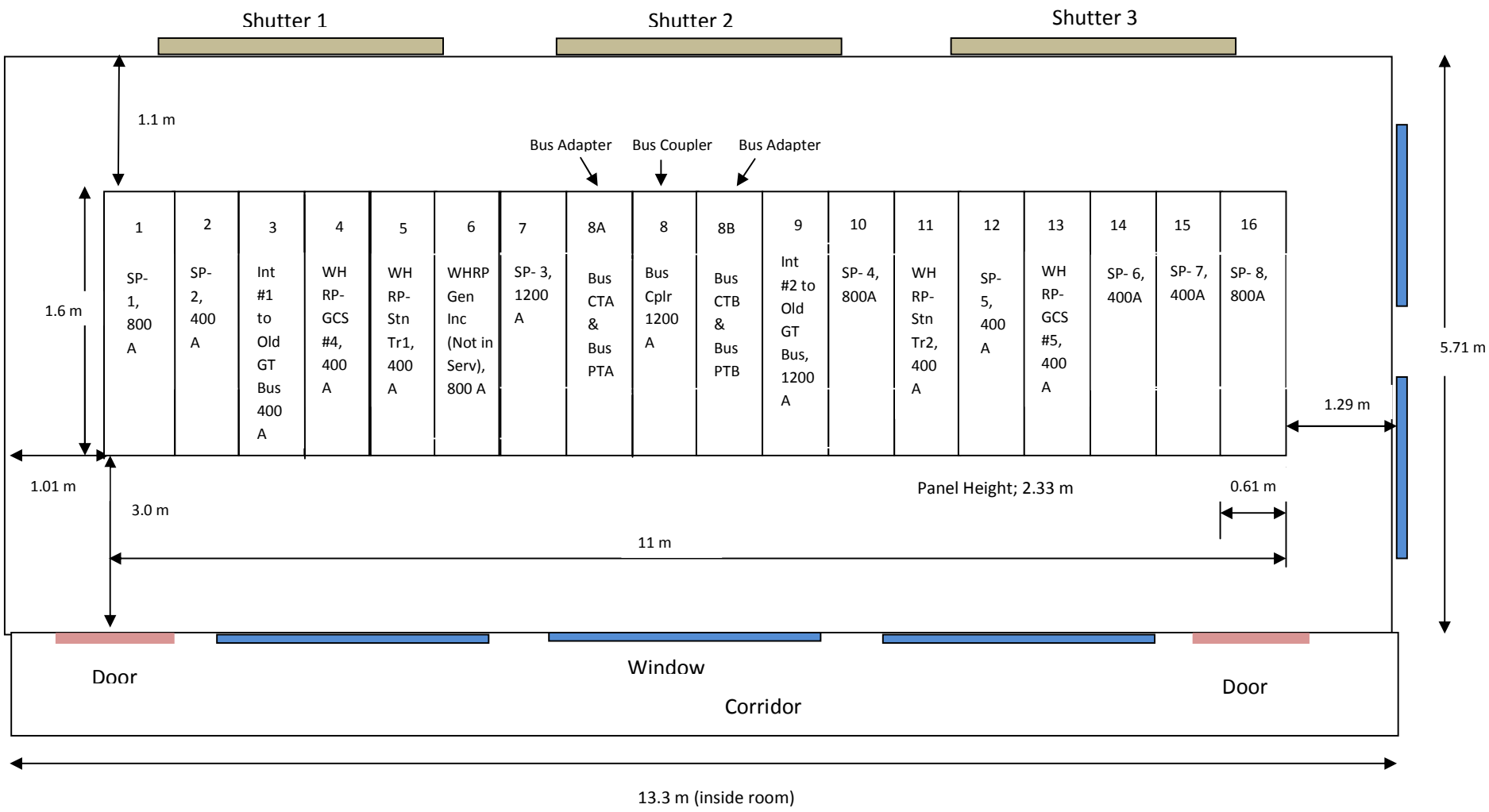
Individual Panel Width = Minimum 650mm



NB: Drawing not to scale

Annexure- V

Layout of Existing 11 KV Switchgear Room with Southern Switchgear Make 18nos Old Panels



NB: The switchgear room is having underground RCC cast / brick walled cable cellar of depth 1.94 m.

NB: Drawing not to scale

Annexure- DDD

INTEGRITY PACT

Between

Oil India Limited (OIL) hereinafter referred to as "The Principal"

And

(Name of the bidder).....hereinafter referred to as "The Bidder/Contractor"

Preamble :

The Principal intends to award, under laid down organizational procedures, contract/s for Tender No. **SDI0044P16** The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organisation "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an external independent Monitor who will monitor the tender process and the execution of the contract for compliance with the principles 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:-

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

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

3. The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a Page 2 of 6 substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits itself 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.

1. The Bidder/Contractor 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 h e/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.

2. The Bidder/Contractor 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.

3. The Bidder/Contractor will not commit any offence under the relevant Anticorruption Laws of India; further the Bidder/Contractor 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.

4. The Bidder/Contractor 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/Contractor 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, before contract award has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or risibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

1. If the Bidder/Contractor has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is entitled also to exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressions within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.

2. The Bidder accepts and undertakes to respect and uphold the Principal's Absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

3. If the Bidder/Contractor can prove that he has restored/recouped the Damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

1. A transgression is considered to have occurred if in light of available evidence no reasonable doubt is possible.

Section 4 - Compensation for Damages

1. If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to 3 % of the value of the offer or the amount equivalent to Earnest Money Deposit/Bid Security, whichever is higher.

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 equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

3. The bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder/Contractor can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount or the liquidated damages, the Bidder/Contractor shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 - Previous transgression

1. The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other 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 or the contract, if already awarded, can be terminated for such reason.

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

1. The Bidder/Contractor undertakes to demand form 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 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 Bidders/Contractors/ Subcontractors

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 Vigilance Office.

Section 8 - External Independent Monitor/Monitors (three in number depending on the size of the contract) (to be decided by the Chairperson of the Principal)

1. The Principal appoints competent and credible external independent 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. He reports to the Chairperson of the Board of the Principal.

3. The Contractor 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 his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Subcontractor with confidentiality.

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 heal the violation, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. 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 Chairperson of the Board of the Principal 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. If the Monitor has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed

against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8. 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 respective 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 Chairperson of the Principal.

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. New Delhi.

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 intensions.

R BARMAN
SR MANAGER MATERIALS (IP)

For the Principal

For the Bidder/Contractor

Place. Duliajan.

Witness 1 : .....

Date 28.01.2016 .

Witness 2 : .....

Technical Bid Checklist **Annexure-EEE**

Tender No.	
Bidder's Name :	

		Compliance by Bidder	
SL. NO.	**BEC / TENDER REQUIREMENTS**	Indicate 'Confirmed' / 'Not Confirmed' / Not applicable	Indicate Corresponding page ref. of unpriced bid or Comments
1	**Bidder to confirm that he has not taken any exception/deviations to the bid document .**		
2	**Confirm that the product offered strictly conform to the technical specifications.**		
3	**Confirm that the Offer has been made with Bid Bond / Bank Guarantee / Earnest Money along with the offer (Wherever Applicable) ?**		
4	**Confirm unconditional validity of the bid for 120 days from the date of opening of techno-commercial bid.**		
5	**Confirm that the prices offered are firm and / or without any qualifications?**		
6	**Confirm that all relevant fields in the on-line bidding format have been filled in by the bidder for the items quoted by them.**		
7	**Confirm that the the price bid is in conformity with OIL's online bidding format ?**		
8	**Confirm that the Bid comply with all the terms & conditions ?**		
9	**Confirm that the offers and all attached documents are digitally signed using digital signatures issued by an acceptable Certifying Authority (CA) as per Indian IT Act 2000.**		
10	**CONFIRM THAT YOU HAVE SUBMITTED THE DULY SIGNED INTEGRITY PACT DOCUMENT (Wherever Applicable)**		
11	**CONFIRM THAT YOU SHALL SUBMIT PERFORMANCE BANK GUARANTEE AS PER NIT IN THE EVENT OF PLACEMENT OF ORDER ON YOU (Wherever Applicable)**		
12	**CONFIRM THAT YOU HAVE SUBMITTED DOCUMENTS AS PER GENERAL QUALIFICATION CRITERIA**		
13	**Confirm that you have submitted Name and Full Address of Issuing Bank including Telephone, Fax Nos and Email id of branch manager where Bid security has been submitted as Bank Guarantee.**		

NOTE: Please fill up the greyed cells only.

Response Sheet **Annexure-FFF**

Tender No.	
Bidders Name	

Bidders Response Sheet

Sl No.	Description	Remarks
1	Name of Bidder	
2	Whether tender document purchased from OIL's offices.	
3	Place of Despatch	
4	Whether Freight charges have been included in your quoted prices	
5	Whether Insurance charges have been included in your quoted prices	
6	Make of quoted Product	
7	Offered Validity of Bid as per NIT	
8	Delivery Period in weeks from placement of order	
9	Complied to Payment terms of NIT (if applicable) otherwise to Standard Payment Terms of OIL or not.	
10	Bid Security Submitted (if applicable)	
11	Details of Bid Security Submitted to OIL (if applicable)	
	a) Bid Security Amount (In Rs):	
	b) Bid Security Valid upto:	
12	If Bid security submitted as Bank Guarantee, Name and Full Address of Issuing Bank including Telephone, Fax Nos and Email id of branch manager	
13	Bid Security if Not submitted reasons thereof	
14	Whether you shall submit Performance Security in the event of placement of order on you (if applicable)	
15	Integrity Pact Submitted (if applicable)	
16	Whether submitted documents in support of General Qualification criteria of NIT	
17	If bidder is Small scale unit whether you have quoted your own product	
18	If bidder is Small scale unit whether you are eligible for purchase preference (as per Govt guideliness)	
19	Whether filled up the bank details for online payment as per Annexure GGG	

NOTE: Please fill up the greyed cells only.

ANNEXURE - GGG

(TO BE FILLED UP BY ALL THE VENDOR IN THEIR OWN LETER HEAD)
(ALL FIELDS ARE MANDATORY)

Tender No.	**:……**
Name of Beneficiary	**:M/s.……**
Vendor Code	**:……...**
Address	**:...…….**
	...……...
Phone No. (Land Line)	**:...…….**
Mobile No.	**:...…….**
E-mail address	**:...…….**
Bank Account No. (Minimum	
Eleven Digit No.)	**:...…….**
Bank Name	**:...…….**
Branch	**:...…….**
Complete Address of your	**:...…….**
Bank	**:...…….**

IFSC Code of your Bank

a) RTGS	**:……...**
b) NEFT	**:……...**
PAN	**:……...**
VAT Registration No.	**:……...**
CST Registration No.	**:……...**
Service Tax Registration No.	**:……...**
Provident Fund Registration	**:……...**

I/We confirm and agree that all payments due to me/us from Oil India Limited can be remitted to our above mentioned account directly and we shall not hold Oil India Limited responsible if the amount due from Oil India Limited is remitted to wrong account due to incorrect details furnished by us.

……
Office Seal **Signature of Vendor**

Counter Signed by Banker:
Seal of Bank:

Enclosure: Self attested photocopies of the following documents-

1) **PAN Card**
2) **VAT Registration Certificate**
3) **Service Tax Registration**
4) **CST Registration**
5) **Provident Registration Certificate**
6) **Cancelled cheque of the bank account mentioned above (in original).**
7) **Bank Statement not older than 15 days on the date of submission.**