OPEN TENDER NOTIFICATION

FOR

Rate contract for supply of Multiple Type of Polymeric Line Insulators at PAN TPNODL

Tender Enquiry No.: TPNODL/OT/2021-22/201

Due Date for Tender Fee: 09.03.2022 [15:00 Hrs.]

Due Date for Bid Submission: 12.03.2022 [15:00 Hrs.]

TP NORTHERN ODISHA DISTRIBUTION LIMITED
(A Tata Power and Odisha Government Joint Venture)
Contracts & Material Management Department
Corporate office: Januganj, Balasore, Odisha-756019

Procedure for Participating in Tender

Tender Enquiry No	Description	EMD (Rs. Lacs)	Tender Participation Fee (Rs)	Last date and time for Payment of Tender Participation Fee
TPNODL/OT/2021-22/201	**Rate contract for supply of Multiple Type of Polymeric Line Insulators at PAN TPNODL**	2.00	5000	09-03-2022 15:00 hrs

EMD is exempted for MSMEs registered in the State of Odisha.

***** MSMEs registered in the State of Odisha shall pay tender fee of Rs. 1,000/- including GST.***

Business Associates falling in MSME category can avail the following benefits-

a. Tender Fees: To participate in the tender, MSMEs registered in the State of Odisha shall pay Rs.1,000/- including GST towards cost of tender paper.

b. Earnest Money Deposit (EMD): EMD shall be exempted for MSME registered in the State of Odisha. However, Bidder shall be barred to participate in the tendering process for a period of 2 years in case it backs out post award of the contract.

c. Qualification Requirement for Open Tenders: Qualification Requirement of Financial Turnover for MSME registered in the State of Odisha shall be reduced to 20% of the existing criteria. For past experience, instead of relying on the volumes / value of earlier Supplies / Projects, assessment of the Bidder shall be done on the basis of feedback from Customers. Past performance experience at Tata Power/ TPNODL and its Group Companies shall supersede feedback from other Customers.

d. Reservation for MSME: TPNODL reserve the rights to procure at least 20% of the total volume of the procurement from MSME registered in the State of Odisha (however, it shall not apply where goods/services are not available with the MSME), subject to matching L1 discovered prices and meeting technical specifications including quality requirements.

e. Performance Bank Guarantees: Performance Bank Guarantee for MSME registered in the State of Odisha shall be 25% of the value normally prescribed.

Please note that corresponding details mentioned in this document will supersede any other details mentioned anywhere else in the Tender Document.

Procedure to Participate in Tender.

Following steps to be done before “Last date and time for Payment of Tender Fee” as mentioned above:

1. Eligible and Interested Bidders to submit duly signed and stamped letter on Bidder's letter head indicating

    a. Tender Enquiry number
    b. Name of authorized person
    c. Contact number
    d. E-mail id
    e. Details of submission of Tender Fee
    f. GST Registration No

2. Non-Refundable Tender Fee, as indicated in table above, to be submitted in the form of Direct Deposit in the following bank account and submit the receipt along with a covering letter clearly indicating the Tender Reference/ Enquiry Number –

    Beneficiary Name – TP Northern Odisha Distribution Limited
    Bank Name – Union Bank of India
    Branch Name – Balasore Branch
    Account No – 500601010280332
    IFSC Code – UBIN0550060

    E-mail with necessary attachment to be sent to swetaraj.parida @tpnodl.com with copy to vipin.chauhan@tpnodl.com before last date and time for payment of Tender Fee.

    Interested bidders to submit Tender Fee and Authorization letter before Last date and time as indicated above, after which link from TPNODL E-Tender system (Ariba) will be shared for further communication and bid submission.

    Please note all future correspondence regarding the tender, bid submission, bid submission date extension, Pre-bid query etc. will happen only through TPNODL E-Tender system (Ariba). User manual to guide the bidders to submit the bid through E-Tender system (Ariba) is also enclosed.

    No e-mail or verbal correspondence will be responded. All communication will be done strictly with the bidders who have done the above step to participate in the Tender.

    Also, it may be strictly noted that once date of “Last date and time for Payment of Tender Participation Fee” is lapsed no Bidder will be sent link from TPNODL E-Tender System (Ariba). Without this link BA will not be able to participate in the tender. Any last moment request to participate in tender will not be entertained.

    Any payment of Tender Fee / EMD by Bidder who have not done the prerequisite will not be refunded.

    Also all future corrigendum to the said tender will be informed on Tender section on website www.tpnodl.com

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TP NORTHERN ODISHA DISTRIBUTION LIMITED
(A Tata Power and Odisha Government Joint Venture)
Contracts & Material Management Department
Corporate office: Januganj, Balasore, Odisha-756019

CONTENTS OF THE ENQUIRY

1.0 Event Information

1.1 Scope of work

Bids are invited from interested Bidders entering into a Rate Contract valid for 1 year for supply of the following items:

S. No.	Description	Unit	QTY.	EMD Amount (Rs.)	Tender Fee (Rs.)
1	33 KV Post Insulator (polymer type)- 10KN	Nos.	1000	200000	5000
2	11 KV Post Insulator (polymer type)- 5KN	Nos.	2000		
3	33KV Pin Insulator (polymer type)- 10 KN	Nos.	23000		
4	11 KV Pin Insulator (Polymer)- 5 KN	Nos.	41500		
5	33KV Disc Insulator (T&C) 70 KN polymer	Nos.	6000		
6	11KV Disc Insulator (T&C) 45 KN Polymer	Nos.	3000		
7	11 KV Disc Insulator (B&S) 45KN polymer	Nos.	4600		

1.2 Availability of Tender Documents

Please refer “Procedure to participate in the e-tender”.

Bidders are requested to visit TPNODL website www.tpnodl.com regularly for any modification / clarification to the bid documents.

1.3 Calendar of Events

(a)	Date of sale/ availability of tender documents from TPNODL Website	From 27.02.2022 onwards
(b)	Date by which interested and eligible vendors to pay tender fee and confirm participation in accordance with “Procedure for participating in tender”	09-03-2022 15:00 hrs
(c)	Date & Time of Pre-Bid Meeting (If any)	Not applicable due to COVID- 19. Queries to be answered through e-mail / TPNODL Tender Website.
(d)	Last Date of receipt of pre-bid queries, if any	04.03.2022: 15:00 Hrs
(e)	Last Date of Posting Consolidated replies to all the pre-bid queries as received	07.03.2022: 15:00 Hrs
(f)	Last date and time of receipt of Bids	12.03.2022: 15:00 Hrs
(g)	Date & Time of opening technical bids & EMD (Envelope-1 & 2)	12.03.2022: 15:30 Hrs
(h)	Date & Time of opening of Price of qualified bids	Will be notified to the successful bidders through our website / e-mail.

Note :- In the event of last date specified for submission of bids and date of opening of bids is declared as a closed holiday for TPNODL, Balasore office the last date of submission of bids and date of opening of bids will be the following working day at appointed times.

1.4 Mandatory documents required along with the Bid

1.4.1 EMD of requisite value and validity
1.4.2 Tender Fee in case the tender is downloaded from website
1.4.3 Requisite Documents for compliance to Qualification Criteria mentioned in Clause 1.7.
1.4.4 Drawing, Type Test details along with a sample of each item as specified at Annexure I (as applicable)
1.4.5 Duly signed and stamped 'Schedule of Deviations' as per Annexure III on bidder's letter head.
1.4.6 Duly signed and stamped 'Schedule of Commercial Specifications' as per Annexure IV on bidder's letter head.
1.4.7 Proper authorization letter / Power of Attorney to sign the tender on the behalf of bidder.
1.4.8 Copy of PAN, GST (In case any of these documents is not available with the bidder, same to be explicitly mentioned in the 'Schedule of Deviations')

Please note that in absence of any of the above documents, the bid submitted by a bidder shall be liable for rejection.

1.5 Deviation from Tender

Normally, the deviations to tender terms are not admissible and the bids with deviation are liable for rejection. Hence, the bidders are advised to refrain from taking any deviations on this Tender. Still in case of any deviations, all such deviations shall be set out by the Bidders, clause by clause in the 'Annexure III - Schedule of Deviations' and same shall be submitted as a part of the Technical Bid.

1.6 Right of Acceptance/ Rejection

Bids are liable for rejection in absence of following documents:-

1.6.1 EMD of requisite value and validity
1.6.2 Tender fee of requisite value
1.6.3 Price Bid as per the Price Schedule mentioned in Annexure-I
1.6.4 Necessary documents against compliance to Qualification Requirements mentioned at Clause 1.7 of this Tender Document.
1.6.5 Filled in Schedule of Deviations as per Annexure III
1.6.6 Filled in Schedule of Commercial Specifications as per Annexure IV
1.6.7 Receipt of Bid within the due date and time

TPNODL reserves the right to accept / reject any or all the bids without assigning any reason thereof.

1.7 Qualification Criteria

1.7.1 The bidder should have an average annual turnover of Rs. 1 crore in last 3 financial years (Any Three FY 16-17, 17-18, 18-19, 19-20). Copy of audited P&L Account to be submitted in this regard.

1.7.2 The bidder should have supplied polymer Insulator of same or higher rating with specifications as mentioned above, minimum 50% of the quantity tendered, during any one of the financial year out of the immediate past three financial years. Copy of work order / completion certificate to be submitted in this regard.

1.7.3 The bidder need to submit type test certificate for the polymeric Insulator. The type tests should have been conducted on the equipment / material of the same design. The type tests should have been conducted within 5 years prior to the date of bid opening. In case the type test reports furnished are not for the quoted equipment / material but for the equipment / material with higher voltage class and/or different capacity, then type test shall be carried out for the offered equipment / material from CPRI/ERDA / International Accredited Lab without any cost implication to the owner and the Type Test reports and relevant drawings duly approved by the Type Testing agency shall be furnished within 1 month from the date issue of RC.

1.7.4 Performance certificate for 1-year satisfactory performance from at least 2 reputed companies is to be submitted. The work against these issued certificates should be completed in last five years from the date of bid submission.

1.7.5 Bidder should have own manufacturing facility to manufacture the Polymeric Insulators of same or higher voltage rating. Bidder must submit undertaking in this regard. In-house acceptance testing facilities for acceptance tests as per TPNODL spec. Bidder must submit undertaking in this regard.

1.7.6 The bidder must have all statutory compliance like valid PAN no, GSTN etc. The bidder must submit the copy of all these registrations

1.8 Marketing Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the General Condition of Contracts. Bidders must agree to these rules prior to participating. In addition to other remedies available, TPNODL reserves the right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the General Condition of Contracts. A bidder who violates the market place rules or engages in behaviour that disrupts the fair execution of the marketplace, may result in restriction of a bidder from further participation in the marketplace for a length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace
- Breach of terms as published in TENDER / NIT

1.9 Supplier Confidentiality

All information contained in this tender is confidential and shall not be disclosed, published or advertised in any manner without written authorization from TPNODL. This includes all bidding information submitted to TPNODL. All tender documents remain the property of TPNODL and all suppliers are required to return these documents to TPNODL upon request. Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

2.0 Evaluation Criteria

- The bids will be evaluated technically on the compliance to tender terms and conditions.
- The bids will be evaluated commercially on the overall all-inclusive lowest cost for the complete tender BOQ as calculated in Schedule of Items [Annexure I]. TPNODL reserves the right to split the order line item wise and / or quantity wise

among more than one Bidder. Hence all bidders are advised to quote their most competitive rates against each line item.

- Bidder has to mandatorily quote of each line item as per schedule of item [Annexure-I]. Failing to do so TPNODL may reject the bid.

NOTE: In case of a new bidder not registered, factory inspection and evaluation shall be carried out to ascertain bidder's manufacturing capability and quality procedures. However TPNODL reserves the right to carry out factory inspection and evaluation for any bidder prior to technical qualification. In case a bidder is found as Disqualified in the factory evaluation, their bid shall not be evaluated any further and shall be summarily rejected. The decision of TPNODL shall be final and binding on the bidder in this regard.

Price Variation Clause: The prices shall remain **firm** during the entire contract period.

3.0 Submission of Bid Documents

3.1 Bid Submission

Bidders are requested to submit their offer in line with this Tender document. TPNODL shall respond to the clarification raised by various bidders and the replies will be sent to all participating bidders through e-mail.

Bids shall be submitted in 3 (Three) parts:

FIRST PART: "EMD" of Rs. 200000/- (Rupees Two Lakhs only) shall be submitted. The EMD shall be valid for 210 days from the due date of bid submission in the form of BG. The EMD has to be strictly in the format as mentioned in General Condition of Contract, failing which it shall not be accepted and the bid as submitted shall be liable for rejection. A separate non-refundable tender fee of stipulated amount also needs to be transferred online through NEFT / RTGS in case the tender document is downloaded from our website.

TP Northern Odisha Distribution Limited Bank Details for transferring Tender Fee and EMD is as below:

Account Name: The TP Northern Odisha Distribution Limited.
Bank Name: Union Bank of India, Balasore
Bank Account No. : 500601010280332
IFSC Code: UBIN0550060

In case of submission of EMD in shape of Bank Guarantee, original hard copy shall be sealed in separate envelope clearly indicating Tender Reference Number, Name of Tender and Name of Business Associate and shall be addressed to:

HOD (Contracts)
The TP Northern Odisha Distribution Limited,
1st Floor Nocci Business Park, Bamapada, Balasore- 756056, Odisha.

SECOND PART: "TECHNICAL BID" shall contain the following documents:

a) Documentary evidence in support of qualifying criteria
b) Technical literature / GTP / Type test report etc. *(if applicable)*
c) Qualified manpower available
d) Testing facilities *(if applicable)*
e) No Deviation Certificate as per the Annexure III – Schedule of Deviations
f) Acceptance to Commercial Terms and Conditions viz Delivery schedule / period, payment terms etc. as per the Annexure IV – Schedule of Commercial Specifications.
g) Quality Assurance Plan / Inspection Test Plan for supply items *(if applicable)*

The technical bid shall be properly indexed and is to be submitted through TPNODL E-tender platform (Ariba) only. Hard copy of Technical Bids need not be submitted.

THIRD PART: "PRICE BID" shall contain only the price details and strictly in format as mentioned in Annexure I along with explicit break up of basic prices, Taxes & duties, Freight etc. In case any discrepancy is observed between the item description stated in Schedule of Items mentioned in the tender and the price bid submitted by the bidder, the item description as mentioned in the tender document (to the extent modified through Corrigendum issued if any) shall prevail. Price Bids have to be mandatorily submitted only through e-procurement portal of TPNODL. Bids submitted through any other form / route shall not be admissible. The interested bidders are requested to obtain user name and password for purpose of bid submission through e-procurement portal of TPNODL, Balasore.

SIGNING OF BID DOCUMENTS:

The bid must contain the name, residence and place of business of the person or persons making the bid and must be signed and sealed by the Bidder with his usual signature. The names of all persons signing should also be typed or printed below the signature.

The Bid being submitted must be signed by a person holding a Power of Attorney authorizing him to do so, certified copies of which shall be enclosed.

The Bid submitted on behalf of companies registered with the Indian Companies Act, for the time being in force, shall be signed by persons duly authorized to submit the Bid on behalf of the Company and shall be accompanied by certified true copies of the resolutions, extracts of Articles of Association, special or general Power of Attorney etc. to show clearly the title, authority and designation of persons signing the Bid on behalf of the Company. Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the bid.

A bid by a person who affixes to his signature the word 'President', 'Managing Director', 'Secretary', 'Agent' or other designation without disclosing his principal will be rejected.

The Bidder's name stated on the Proposal shall be the exact legal name of the firm.

3.2 Contact Information

All the bidders are requested to send their pre-bid queries (if any) against this tender through e-mail within the stipulated timelines. The consolidated reply to all the queries received shall be posted on TPNODL website by the stipulated timelines as detailed in calendar of events.

Communication Details:

Package Owner - Contracts

Name: Mr. Swetaraj Parida

Contact No.: +91 9556571693

E-Mail ID: swetaraj.parida@tpnodl.com

HoD- Contracts & MM

Name: Mr. Vipin Chauhan

Contact No: +91 9717393121

E-Mail ID: vipin.chauhan@tpnodl.com

3.3 Bid Prices

Bidders shall quote for the entire Scope of Supply / work with a break up of prices for individual items and Taxes & duties. The bidder shall complete the appropriate Price Schedules included herein, stating the Unit Price for each item & total price with taxes, duties & freight up to destination at various sites of TPNODL. The all-inclusive prices offered shall be inclusive of all costs as well as Duties, Taxes and Levies paid or payable during the execution of the supply work, breakup of price constituents.

The quantity break up shown else-where other than Price Schedule is tentative. The bidder shall ascertain himself regarding material required for completeness of the entire work. Any items not indicated in the price schedule but which are required to complete the job as per the Technical Specifications / Scope of Work / SLA mentioned in the tender, shall be deemed to be included in prices quoted.

3.4 Bid Currencies

Prices shall be quoted in Indian Rupees Only.

3.5 Period of Validity of Bids

Bids shall remain valid for 180 days from the due date of submission of the bid.

Notwithstanding clause above, the TPNODL may solicit the Bidder's consent to an extension of the Period of Bid Validity. The request and responses thereto shall be made in writing.

3.6 Alternative Bids

Bidders shall submit Bids, which comply with the Bidding documents. Alternative bids will not be considered. The attention of Bidders is drawn to the provisions regarding the rejection of Bids in the terms and conditions, which are not substantially responsive to the requirements of the bidding documents.

3.7 Modifications and Withdrawal of Bids

The bidder is not allowed to modify or withdraw its bid after the Bid's submission. The EMD as submitted along with the bid shall be liable for forfeiture in such event.

3.8 Earnest Money Deposit (EMD)

The bidder shall furnish, as part of its bid, an EMD amounting as specified in the tender. The EMD is required to protect the TPNODL against the risk of bidder's conduct which would warrant forfeiture.
The EMD shall be denominate in any of the following form:

- Banker's Cheque / Demand Draft / Pay order drawn in favor of The TP Northern Odisha Distribution Limited, payable at Balasore.
- Online transfer of requisite amount through NEFT / RTGS.
- Bank Guarantee valid for 210 days after due date of submission.

The EMD shall be forfeited in case of:

a) The bidder withdraws its bid during the period of specified bid validity.

Or

b) The case of a successful bidder, if the Bidder does not
i) accept the purchase order, or
ii) furnish the required performance security BG

3.9 Type Tests (if applicable)

The type tests specified in TPNODL specifications should have been carried out within five years prior to the date of opening of technical bids and test reports are to be submitted along

with the bids. If type tests carried out are not within the five years prior to the date of bidding, the bidder will arrange to carry out type tests specified, at his cost. The decision to accept / reject such bids rests with TPNODL.

4.0 Bid Opening & Evaluation process

4.1 Process to be confidential

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence the TPNODL's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

4.2 Technical Bid Opening

Bids shall be opened as per the schedule mentioned in Calendar of Events. In case of limited tenders, the bids shall be opened internally by TPNODL. Owing to COVID Scenario, in case of Open Tenders also, the bids shall be opened internally by TPNODL. Technical bid must not contain any cost information whatsoever.

First the “EMD” will be checked. Bids without EMD/ cost of tender (if applicable) of required amount/ validity in prescribed format, shall be rejected.

Next, the technical bid of the bidders who have furnished the requisite EMD will be opened, one by one. The salient particulars of the techno commercial bid will be read out at the sole discretion of TPNODL.

4.3 Preliminary Examination of Bids/ Responsiveness

TPNODL will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order. TPNODL may ask for submission of original documents in order to verify the documents submitted in support of qualification criteria.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

Prior to the detailed evaluation, TPNODL will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

Bid determined as not substantially responsive will be rejected by the TPNODL and/or the TPNODL and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

4.4 Techno Commercial Clarifications

Bidders need to ensure that the bids submitted by them are complete in all respects. To assist in the examination, evaluation and comparison of Bids, TPNODL may, at its discretion, ask the Bidder for a clarification on its Bid for any deviations with respect to the TPNODL specifications and attempt will be made to bring all bids on a common footing. All responses to requests for clarification shall be in writing and no

change in the price or substance of the Bid shall be sought, offered or permitted owing to any clarifications sought by TPNODL. After all techno commercial issues are clarified, the date of price bid opening will be intimated to the technically accepted bidders and same shall also be notified at TPNODL website.

4.5 Price Bid Opening

Price bids will be opened at the stipulated date and time. The EMD of the bidder withdrawing or substantially altering his offer at any stage after the technical bid opening will be forfeited at the sole discretion of TPNODL without any further correspondence in this regard.

4.6 Reverse Auctions

TPNODL reserves the right to conduct the reverse auction (instead of public opening of price bids) for the products/ services being asked for in the tender and reserves the rights to conduct the manual negotiation with the BA who is declared L1 after Reverse Auction.. The terms and conditions for such reverse auction events shall be as per the Acceptance Form attached as Annexure VI of this document. The bidders along with the tender document shall mandatorily submit a duly signed copy of the Acceptance Form attached as Annexure VI as a token of acceptance for the same.

5.0 Award Decision

TPNODL will award the contract to the successful bidder whose bid has been determined to be the lowest-evaluated responsive bid as per the Evaluation Criterion mentioned at Clause 2.0. The Cost for the said calculation shall be taken as the all-inclusive cost quoted by bidder in Annexure I (Schedule of Items) subject to any corrections required in line with Clause 4.3 above. The decision to place purchase order/LOI solely depends on TPNODL on the cost competitiveness across multiple lots, quality, delivery and bidder's capacity, in addition to other factors that TPNODL may deem relevant.

TPNODL reserves all the rights to award the contract to one or more bidders so as to meet the requirement or nullify the award decision without assigning any reason thereof.

In case any supplier is found unsatisfactory during the delivery process, the award will be cancelled and TPNODL reserves the right to award other suppliers who are found fit.

6.0 Order of Preference/Contradiction:

In case of contradiction in any part of various documents in tender, following shall prevail in order of preference:

1. Schedule of Items (Annexure I)
2. Technical Specifications (Annexure II)
3. Special Conditions of Contract (Clause 7.0)
4. Submission of Bid Documents (Clause 3.0)
5. Acceptance Form for Participation in Reverse Auction (Annexure VI)
6. General Conditions of Contract (Annexure VIII)

7.0 Post Award Contract Administration

7.1 Special Conditions of Contract

Rate contract shall be valid for a period of 1 year from the placement of Contract. Release Order (RO) shall be placed as per the requirement of TPNODL. Rate shall be firm and fixed

during the validity of the contract and as per requirement of material, release order shall be issued time to time.

♣ Business Associate (BA) shall submit applicable Performance Bank Guarantee as per GCC within 15 days of issuance of rate contract or release order. PBG applicable shall be @ 5% of Rate Contract Value. Validity of BG shall be till expiry date of RC plus delivery period plus warranty period. Claim period will be additional one month.

♣ Any change in statutory taxes, duties and levies during the contract period shall be borne by TPNODL. However, in case of delay in work execution owing to reasons not attributable to TPNODL, any increase in total liability shall be passed on the Bidder, whereas any benefits arising owing to such statutory variation in taxes and duties shall be passed on TPNODL.

♣ Statutory Variations: Any changes in existing taxes/ Duties and levies, Introduction of new taxes and duties etc. during the period of the contract shall be paid at actuals to BA subject to BA shall submit the tax break up in details, however, where BA has quoted the all inclusive prices and not shown the tax break-up, this clause will not be applicable. The date of issue of MDCC shall be used for this purpose.

♣ Quotation in all BOQ items is mandatory, and bid shall be rejected if any line of found blank in price bid.

♣ Delivery period shall be 60 days from date of receipt of release order / CAT-A issuance, whichever is later.

♣ Late delivery(LD) clause will be applicable as per GCC.

♣ All other terms and conditions of TPNODL General Conditions of Contract shall be applicable.

♣ TPNODL shall short close the issued Release Order / Rate contract, in case of any quality issues

♣ Terms of Payment: On delivery of the materials in good condition and certification of acceptance by certified official, Associate shall submit the Bills/ Invoices in original in the name of TP Northern Odisha Distribution Limited to Invoice Desk. The payment shall be released within 45 days from the date of submission of certified bills/ invoices.

7.3 Delivery Terms

The delivery of material shall be made as per special condition of contract mentioned in point 7.1.

7.4 Warranty Period

Guarantee period shall be 24 months from the date of supply.

Other details of guarantee clause will remain the same as mentioned in attached technical specification.

7.5 Payment Terms

On delivery of the materials in good condition and certification of acceptance by certified official, Associate shall submit the Bills/ Invoices in original in the name of TP Northern Odisha Distribution Ltd. to Invoice Desk. The payment shall be released within 45 days from the date of submission of certified error free bills/ invoices.

7.6 Climate Change

Significant quantities of waste are generated during the execution of project and an integrated approach for effective handling, storage, transportation and disposal of the same shall be adopted. This would ensure the minimization of environmental and social impact in order to combat the climate change.

7.7 Ethics

- TPNODL is an ethical organization and as a policy TPNODL lays emphasis on ethical practices across its entire domain. Bidder should ensure that they should abide by all the ethical norms and in no form either directly or indirectly be involved in unethical practice.
- TPNODL work practices are governed by the Tata Code of Conduct which emphasizes on the following:
- We shall select our suppliers and service providers fairly and transparently.
- We seek to work with suppliers and service providers who can demonstrate that they share similar values. We expect them to adopt ethical standards comparable to our own.
- Our suppliers and service providers shall represent our company only with duly authorized written permission from our company. They are expected to abide by the Code in their interactions with, and on behalf of us, including respecting the confidentiality of information shared with them.
- We shall ensure that any gifts or hospitality received from, or given to, our suppliers or service providers comply with our company's gifts and hospitality policy.
- We respect our obligations on the use of third party intellectual property and data.

Bidder is advised to refer GCC attached at Annexure VII for more information.

Any ethical concerns with respect to this tender can be reported to the following e-mail ID: pradip.sil@tpnodl.com

8.0 Specification and standards

Attached separately with tender.

9.0 General Condition of Contract

Any condition not mentioned above shall be applicable as per GCC for Supply attached along with this tender at Annexure VII.

10.0 Safety

Safety related requirements as mentioned in our safety Manual put in the Company's website which can be accessed by:

http://www.tpnodl.com

All Associates shall strictly abide by the guidelines provided in the safety manual at all relevant stages during the contract period.

ANNEXURE I
Schedule for Items

Sr. No.	Item description	HSN Code	Qty.	UoM	Unit Price (Rs.)	GST	Unit Price with GST(Rs.)	Amount Rs.)
1	33 KV Post Insulator (polymer type)- 10KN		Nos	1000				
2	11 KV Post Insulator (polymer type)- 5KN		Nos	2000				
3	33KV Pin Insulator (polymer type)- 10 KN		Nos	23000				
4	11 KV Pin Insulator (Polymer)- 5 KN		Nos	41500				
5	33KV Disc Insulator (T&C) 70 KN polymer		Nos	6000				
6	11KV Disc Insulator (T&C) 45 KN Polymer		Nos	3000				
7	11 KV Disc Insulator (B&S) 45KN polymer		Nos	4600				
TOTAL AMOUNT(Rs.)								

NOTE:

- The overall period of the Rate contract shall be for One year and prices shall be firm till the validity of contract. Release order shall be issued as per requirement and location of delivery shall be intimated through Release Order.
- Total Inclusive amount as mentioned above is landing cost at PAN TPNODL and, shall be inclusive of all taxes, duties, freight, and insurance, loading & unloading charges.
- The bids will be evaluated commercially on the all-inclusive BOQ value.
- The bidders are advised to quote prices strictly in the above format and for all the line items as mentioned above in line with requirements mentioned in this document. Failing to do so, bids are liable for rejection.
- The bidder must fill each and every column of the above format. Mentioning “extra/inclusive” in any of the column may lead for rejection of the price bid.

- No cutting/ overwriting in the prices is permissible.
- The quantity mentioned above is for evaluation purpose only and may vary during the execution.
- Above price quoted shall be on FOR TPNODL, Odisha Stores/ Site & inclusive of Transit Insurance & Packing and Forwarding Charges and shall be inclusive of the unloading and stacking at TPNODL.

Signature & Seal of the Bidder

Annexure II

Technical Specifications attached separately with the tender.

ANNEXURE III

Schedule of Deviations

Bidders are advised to refrain from taking any deviations on this TENDER. Still in case of any deviations, all such deviations from this tender document shall be set out by the Bidders, Clause by Clause in this schedule and submit the same as a part of the ***Technical Bid.***

Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the TPNODL's specifications:

Technical Deviations:-

S. No.	Clause No.	Tender Clause Details	Details of deviation with justifications

Commercial Deviations:-

S. No.	Clause No.	Tender Clause Details	Details of deviation with justifications

By signing this document we hereby withdraw all the deviations whatsoever taken anywhere in this bid document and comply to all the terms and conditions, technical specifications, scope of work etc. as mentioned in the standard document except those as mentioned above.

Seal of the Bidder:

Signature:

Name:

ANNEXURE IV

Schedule of Commercial Specifications

(The bidders shall mandatorily fill in this schedule and enclose it with the offer Part I: Technical Bid. In the absence of all these details, the offer may not be acceptable.)

S. No.	Particulars	Remarks
1.	Prices firm or subject to variation (If variable indicate the price variation Clause with the ceiling if applicable)	Firm / Variable
1a.	If variable price variation on clause given	Yes / No
1b.	Ceiling	--------- %
1c.	Inclusive of Excise Duty	Yes / No (If Yes, indicate % rate)
1d.	Sales tax applicable at concessional rate	Yes / No (If Yes, indicate % rate)
1e.	Octroi payable extra	Yes / No (If Yes, indicate % rate)
1f.	Inclusive of transit insurance	Yes / No
2.	Delivery	As per Tender
3.	Guarantee clause acceptable	Yes / No
4.	Terms of payment acceptable	Yes / No
5.	Performance Bank Guarantee acceptable (As per GCC)	Yes / No
6.	Liquidated damages clause acceptable	Yes / No
7.	Validity (180 days) (From the date of opening of technical bid)	Yes / No
8.	Inspection during stage of manufacture	Yes / No
9.	Rebate for increased quantity	Yes / No (If Yes, indicate value)
10.	Change in price for reduced quantity	Yes / No (If Yes, indicate value)
11.	Covered under Small Scale and Ancillary Industrial Undertaking Act 1992	Yes / No (If Yes, indicate, SSI Reg'n No.)

ANNEXURE V

Checklist of all the documents to be submitted with the Bid

Bidder has to mandatorily fill in the checklist mentioned below:-

S. No.	Documents attached	Yes / No / Not Applicable
1	EMD of required value	
2	Tender Fee as mentioned in this RFQ	
3	Company profile / organogram	
4	Signed copy of this RFQ as an unconditional acceptance	
5	Duly filled schedule of commercial specifications (Annexure IV)	
6	Sheet of commercial/ technical deviation if any (Annexure III)	
7	Balance sheet for the last completed three financial years; mandatorily enclosing Profit & loss account statement	
8	Acknowledgement for Testing facilities if available (duly mentioned on bidder letter head)	
9	List of Machine/ tools with updated calibration certificates if applicable	
10	Details of order copy (duly mentioned on bidder letter head)	
11	Order copies as a proof of quantity executed	
12	Details of Type Tests if applicable (duly mentioned on bidder letter head)	
13	All the relevant Type test certificates as per relevant IS/ IEC (CPRI/ ERDA/ other certified agency) if applicable	
14	Project/ Supply Completion certificates	
15	Performance certificates	
16	Client Testimonial/ Performance Certificates	
17	Credit rating/ Solvency certificate	
18	Undertaking regarding non blacklisting (On company letter head)	
19	List of trained/ Untrained Manpower	

Annexure VI

Acceptance Form for Participation in Reverse Auction Event

(To be signed and stamped by the bidder)

In a bid to make our entire procurement process more fair and transparent, TPNODL intends to use the reverse auctions as an integral part of the entire tendering process. All the bidders who are found as technically qualified based on the tender requirements shall be eligible to participate in the reverse auction event.

The following terms and conditions are deemed as accepted by the bidder on participation in the bid event:

1. TPNODL shall provide the user id and password to the authorized representative of the bidder. *(Authorization Letter in lieu of the same shall be submitted along with the signed and stamped Acceptance Form).*
2. TPNODL will make every effort to make the bid process transparent. However, the award decision by TPNODL would be final and binding on the supplier.
3. The bidder agrees to non-disclosure of trade information regarding the purchase, identity of TPNODL, bid process, bid technology, bid documentation and bid details.
4. The bidder is advised to understand the auto bid process to safeguard themselves against any possibility of non-participation in the auction event.
5. In case of bidding through Internet medium, bidders are further advised to ensure availability of the entire infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitch, internet response issues, software or hardware hangs, power failure or any other reason shall not be the responsibility of TPNODL.
6. In case of intranet medium, TPNODL shall provide the infrastructure to bidders. Further, TPNODL has sole discretion to extend or restart the auction event in case of any glitches in infrastructure observed which has restricted the bidders to submit the bids to ensure fair & transparent competitive bidding. In case of an auction event is restarted, the best bid as already available in the system shall become the start price for the new auction.
7. In case the bidder fails to participate in the auction event due any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid as submitted by the bidder as a part of the tender shall be considered as the bidder's final no regret offer. Any offline price bids received from a bidder in lieu of non-participation in the auction event shall be out-rightly rejected by TPNODL.
8. The bidder shall be prepared with competitive price quotes on the day of the bidding event.
9. The prices as quoted by the bidder during the auction event shall be inclusive of all the applicable taxes, duties and levies and shall be FOR at TPNODL site.
10. The prices submitted by a bidder during the auction event shall be binding on the bidder.
11. No requests for time extension of the auction event shall be considered by TPNODL.
12. The original price bids of the bidders shall be reduced on pro-rata basis against each line item based on the final all inclusive prices offered during conclusion of the auction event for arriving at Contract amount.

Signature & Seal of the Bidder

Annexure VII

General Conditions of Contract

CONTENTS

CONTENTS	
CLAUSE NO.	**DESCRIPTION**

CONTENTS

1.0 ORGANIZATIONAL VALUES

The Tata Group has always been a value driven organization. These values continue to direct the Group's growth and businesses. The six core Tata Values underpinning the way we do business are:

Integrity - We must conduct our business fairly, with honesty and transparency. Everything we do must stand the test of public scrutiny.

Understanding - We must be caring, respectful, compassionate and humanitarian towards our colleagues and customers around the world and always work for the benefit of India.

Excellence - We must constantly strive to achieve the highest possible standards in our day to day work and in the quality of goods and services we provide.

Unity - We must work cohesively with our colleagues across the group and with our customers and partners around the world to build strong relationships based on tolerance, understanding and mutual co-operation.

Responsibility - We must continue to be responsible and sensitive to the countries, communities and environments in which we work, always ensuring that what comes from the people goes back to the people many times over.

Agility - We must work in a speedy and responsive manner and be proactive and innovative in our approach.

2.0 Tata Code of Conduct

The Business Associate and TPNODL shall be bound by the provisions/ clauses mentioned in Tata Code of Conduct (TCoC) in all their dealings with stakeholders. The Associate is advised to go through the TCoC document available as Annexure-J.

3.0 CONTRACT PARAMETERS

3.1 Issue/Award of Contract

TPNODL awards the contract to the Associate in writing in the form of Purchase Order (PO) or Rate Contract (RC), hereafter referred as Contract, through in any or all of following modes physical handover / post / e-mail / web document / fax with all the attachments/enclosures which shall be part of the contract document.

On receipt of the contract, the associate shall return to TPNODL copy of the contract document duly signed by legally authorized representative of associate, within two days of Effective Date of Contract for contracts having contract execution time less than 30 days and within five days for all other contracts.

Note- In case of RC though, further Release Orders (RO) shall be issued by TPNODL on RC rates and terms & Conditions as per the requirement of TPNODL.

3.2 Contract Commencement Date

The date of issue/award of contract shall be the Effective Date of Contract or Contract Commencement date.

3.3 Contract Completion Date

The date of expiry of Guarantee Period shall be deemed as the Contract Completion Date.

3.4 Contract Period/Time

The period from Contract Commencement Date to Contract Completion Date shall be deemed as the Contract Period/Time.

3.5 Contract Execution Completion Date

The stipulated date for completing the supply as per schedule of quantities shall be deemed as the Contract Execution Completion Date.

3.6 Contract Price /Value

The total all-inclusive price/value mentioned in the PO/RC is the Contract Price/Value and is based on the quantity, unit rates and prices quoted and awarded and shall be subject to adjustment based on actual quantities supplied and accepted and certified by the authorized representative of the company unless otherwise specified in schedule of quantities or in contract documents.

3.7 Contract Document

The Contract Document shall mean and include but not limited to the following:

- NIT/Tender Enquiry, QR, Instruction to Bidders, Special Condition of Contract (SCC) of tender, GCC, Technical & Commercial Specifications including relevant annexure and attachments).
- Bids & Proposals Received from Associate including relevant annexure/attachments.
- RC/PO with agreed deviations from the tender/bid documents.
- All the Inspection and Test reports, Detailed Engineering Drawings.
- Material Dispatch Clearance Certificate (MDCC).
- Minutes of Meeting (MoM)

3.8 Contract Language

All documents, instructions, catalogues, brochures, pamphlets, design data, norms and calculations, drawings, operation, maintenance and safety manuals, reports, labels, on deliveries and any other data shall be in English Language.

The Contract documents and all correspondence between the TPNODL, Third Parties associated with the contract, and the Associate shall be in English language.
However, all signboards required indicating "Danger" and/or security at site and otherwise statutory required shall be in English, Hindi, and local languages.

3.9 Reverse Auction

TPNODL reserves the right to conduct the reverse auction (instead of public opening of price bids) for the products / services being asked for in the tender. The terms and conditions for such reverse auction events shall be as per the Acceptance Form attached in Annexure F. The

bidders along with the tender document shall mandatorily submit a duly signed copy of the Acceptance Form as mentioned in the Annexure J as a token of acceptance for the same.

4.0 SCOPE OF WORK

All the activities that are to be undertaken by the Associate to realize the contractual deliverables in completeness form Scope of Work. Following clauses list, but not limited to, major requirements of the scope of work.

The associate shall satisfy himself and undertake fully the technical/commercial requirements of items to be supplied as listed in the Schedule of Quantities together with the tests to be performed /test reports to be furnished before dispatch, arrangement of stage and final inspections during manufacturing as per terms and conditions of contract, technical parameters & delivery terms and conditions including transit insurance to be met in order to fully meet TPNODL's requirements.

Completeness: Any supplies and services which might have not been specifically mentioned in the Contract but are necessary for the scope mentioned in Special Terms & Conditions and/or completeness of the works at the highest possible level, including any royalties, license fees & compensation to be paid, whether incurred by the associates or by a third party for the work covered in the scope, regardless of when incurred, shall be supplied/provided by the associate without any extra cost and within the time schedule for efficient , smooth and satisfactory operation and maintenance of the works at the highest possible level under Indian conditions (but according to international standards for facility of this type), unless expressly excluded from the scope of supplies and services in this Contract.

TPNODL have the right, during the performance of the Contract, to change the scope and/or technical character of the Project and/or of the supplies and services stipulated in the Contract by submitting a request in writing to the Associate. The Associate shall, within fifteen days of receipt of such request from the TPNODL, provide Purchaser with a reasonably detailed estimate of the cost of the change outlined in the request.

In the event, TPNODL requests a change, the Contract price and time shall be adjusted upwards or downwards, as the case may be and shall be mutually agreed to. The associate shall not be entitled to any extension of time unless such changes adversely affect the time schedule.

The Associate shall not proceed with the changes as requested till adjustment of contract price and time schedule where so applicable in terms of or otherwise directed by the TPNODL.

4.1 Bid Evaluation- Commercial & Technical

TPNODL reserves the right to evaluate the bid on below parameters as per the requirement:

Commercial Evaluation: The bid shall be evaluated on the basis of Qualifying Requirement parameters and other commercial parameters as mentioned in tender.

Technical Evaluation: The bid shall be evaluated on the parameters and not limited to Bidder Experience, Bidder Performance with other utility/company, internal performance feedback, Technical Specification, General Technical Parameters (GTP), Layout, Drawings etc.

TPNODL reserves the right to carry out Factory Evaluation of Manufacturer along with the Visit to executed Sites for further evaluation to ascertain bidder's manufacturing capability, quality procedures & Performance of executed works.

5.0 PRICES/RATES/TAXES

Unless specified elsewhere in the contract document, the prices/rates are inclusive of cost of finished product for which MDCC will be issued by TPNODL, packaging and forwarding charges, freight and transit insurance charges covering loading at Associate's works, transportation to TPNODL store/site & unloading & delivery at TPNODL stores/TPNODL site, cost of documentation including all the relevant test certificates and other supportive documents to be furnished.

The Prices/Rates are inclusive of all taxes, levies, cess and duties, particularly Goods and Services Tax as applicable. All government levy / taxes shall be paid only when the invoice is submitted according to the relevant act.

The prices/rates shall remain firm till actual completion of entire supply of goods/material/equipment as per contract is achieved and shall remain valid till the completion of the contract.

The prices shall remain unchanged irrespective of TPNODL making changes in quantum in all or any of the schedules of items of contract.

5.1 Changes in Statutory Tax Structure

If rate of any or all of the statutory taxes and duties applicable to the contract changes, such changes shall be incorporated by default if the changes occur within the contract execution time and shall be applicable if the contract is executed by the Associate within the Contract Execution Time.

For execution of contracts beyond contract execution time, where the delay is not attributable to TPNODL no upward revision in tax /duties shall be considered irrespective of changes in the statutory tax structure either within the contract execution time or beyond. However, in such cases, benefits due to any downward revisions in statutory tax rates shall be passed on to TPNODL.

6.0 TERMS OF PAYMENT

On delivery of the materials in good condition and certification of acceptance by TPNODL official, Associate shall submit the Bills/Invoices in original in the name of "TPNODL" to invoice desk, complete with all required documents as under:

- Test Reports (4 sets).
- MDCC issued by TPNODL.
- Packing List.
- Drawing and Catalogue.
- Guarantee/Warrantee Card.
- Delivery Challan.
- O&M Manual.
- Copy of Order.
- Minutes of Meeting.

- E-Way challan (if applicable)

Bills/ invoices shall mention Supplier's GST Number. TPNODL will make 100% payment within 45 days of submission of the Bill/Invoice complete in all respects and along with all the requisite documents mentioned above, subject to condition that Associate has furnished the requisite Security-cum-Performance Guarantee as stipulated in the contract.

6.1 Quantity Variation

Payment will be made on the basis of actual quantity of supplies/actual measurement of works accepted by TPNODL and not on the basis of contract quantity.

6.2 Full and Final Payment

Full & Final Payment in all contracts shall be made subject to the associate submitting "No Demand Certificate" in the format as per Annexure-C.

7.0 MODE OF PAYMENT

Payment shall be made through crossed RTGS/ NEFT/ Online Net banking mode whichever of the two modes chosen by the Associate, in favour of Associate's Bank Account on TPNODL records, on whose name Contract has been issued. Those Associates opting for the RTGS mode shall submit the details of Bank Account and other details as per annexure G. Further, for any payments made, TPNODL is not responsible for any consequences/disputes Associate have among the owners channel partners, sub-Associates and all such dispute/concerns shall be settled solely by the Associate.

8.0 SECURITY CUM PERFORMANCE DEPOSIT

Associates shall submit within 21 days from the effective date of issue of PO/RC, Security Performance Bank Guarantee (SPBG) in the format as per Annexure B of this document from banks acceptable to TPNODL for:

(a) 5% of the PO value if purchase order value is more than Rs 5 Crores.
(b) 10% of the PO value if purchase order value is less than Rs 5 Crores.
(c) 5% of the RC value in case of Rate Contract. This shall remain valid till the Guarantee period plus one month.

In case, PBG will not submitted by BA within 21 days post awarding the contract, TPNODL will reserve the right to take any appropriate action. However, in case of non-submission of PBG till the date of first bill submission, the amounts towards PBG shall be retained by TPNODL from Bills.

The validity of PBG shall be Guarantee Period of contract, plus one month.

- For PO/RC values less than Rs. 5 lacs, Associate may request for deduction of amount equivalent to SPBG value from their first invoice. Such amount shall be withheld by TPNODL while processing the invoice and shall be released after completion of Guarantee Period plus one month.
- For PO/RC values less than Rs. 3 lacs, the clause (8.0) for Security cum Performance Bank Guarantee (SPBG) shall not be applicable.

- In case of RC (Rate Contract) after the expiry of RC validity, Associate shall have to submit SPBG. However, the Associate has the option to re-submit the SPBG as per actual RO

  (Release Order) value issued against the RC, valid for Guarantee Period plus one month. The Guarantee Period shall be considered as per the last RO issued against the said RC. The original SPBG as submitted against the RC shall be released on submission of the new SPBG to TPNODL. Alternatively, Associate may extend the validity of original SPBG only till the requisite period, i.e. Guarantee Period plus one month.

9.0 STATUTORY COMPLIANCE

9.1 Compliance to Various Acts

Associate should ensure adherence to all applicable laws, rules and regulation applicable under this contract from time to time. In case of violation any risk, costs etc shall be in associates account and keep TDPPL indemnified always till completion of contracts.

9.2 SA 8000

As TPNODL/ Tata Power is SA 8000 compliant, it expects its Associates to follow guidelines of SA 8000:2014 on the following aspects

1. Child Labour
2. Forced or Compulsory Labour
3. Health & Safety
4. Freedom of Association & Right to Collective Bargaining
5. Discrimination
6. Disciplinary Practices
7. Working Hours
8. Remuneration
9. Management System

9.3 Affirmative Action

TPNODL appreciate and welcome the engagement/employment of persons from SC/ST community or any other deprived section of society by their business associates.

Relaxation in Contract Clauses under Affirmative Action for SC/ ST Business Associates**

TPNODL believes that inclusive growth is the key to sustainable development, and to promote the same Policy on Affirmative Action for Scheduled Caste & Scheduled Tribe Communities has been adopted across the company.

Under the same pre-text, and to promote entrepreneurship among SC/ST community TPNODL has taken initiative by proposing relaxations in contract clauses as per below:

S. No	Initiative	for SC/ ST BA's	Guideline Document
1	Tender Fees	100% waiver for SC/ST community	All Open Tenders

2	Earnest Money Deposit	50 % relaxation of estimated EMD value	All limited and Open Tenders
3	Performance Bank Guarantee	50% relaxation in PBG for order value above 50 lacs else 25% relaxation	All limited and Open tenders
4	Turnover	25% relaxation in company turnover under qualifying requirement criteria	All Open Tenders

****Classification of BAs under SC/ST shall be governed under following guidelines:**

- Proprietorship/ Single Ownership Firm: Proprietor of the firm should be from SC/ST community. Governing document shall be duly audited balance Sheet for the last FY bearing the name of proprietor.
- Partnership Firm: Only such firms shall qualify which have SC/ST partners holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Partnership Deed and audited balance sheet/ ITR for last FY.
- Private limited company: Only such firms shall qualify which have SC/ST directors holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Memorandum of Understanding (MoU) and/or Article of Association (AoA).

Governing document shall be Memorandum of Understanding (MoU) and/or Article of Association (AoA).

Note: Certification from SC/ST commission shall be required for deciding upon SC/ST status of a person.

9.4 MSME Development ACT 2006

Provisions for Firms falling in The Micro, Small and Medium Enterprise Development Act 2006:-

- Business Associate is requested to inform the TPNODL if they fall under provisions of The Micro, Small and Medium Enterprises Development Act, 2006 legislation, and provide necessary documents to TPNODL. The Associate also needs to mention the relevant details on their invoice/ bill.
- Business Associate shall submit the self-undertaking of registration in MSME category at the time of bidding as well as on an annual basis to TPNODL, enabling them to avail the consequent benefits, failing which TPNODL may take appropriate action against such defaults.
- Business Associates falling in MSME category can avail the following benefits-

  a. **Tender Fees:** To participate in the tender, MSMEs registered in the State of Odisha shall pay Rs.1,000/- including GST towards cost of tender paper.

  b. **Earnest Money Deposit (EMD):** EMD shall be exempted for MSME registered in the State of Odisha. However, Bidder shall be barred to participate in the tendering process for a period of 2 years in case it backs out post award of the contract.

  c. **Qualification Requirement for Open Tenders:** Qualification Requirement of Financial Turnover for MSME registered in the State of Odisha shall be reduced to 20% of the existing criteria. For past experience, instead of relying on the volumes / value of earlier Supplies / Projects, assessment of the Bidder shall be done on the basis of feedback from Customers. Past performance experience at

Tata Power/ TPNODL and its Group Companies shall supersede feedback from other Customers.

d. **Reservation for MSME:** TPNODL reserve the rights to procure at least 20% of the total volume of the procurement from MSME registered in the State of Odisha (however, it shall not apply where goods/services are not available with the MSME), subject to matching L1 discovered prices and meeting technical specifications including quality requirements.

e. **Performance Bank Guarantees:** Performance Bank Guarantee for MSME registered in the State of Odisha shall be 25% of the value normally prescribed.

9.5 ISO 14001

The vendor to confirm whether their organization is ISO 14001 certified. If not, the Vendor must certify that the handling, use and disposal of their product/ by-products conform to practices consistent with sound environment management and local statues. The Vendor shall ensure that all the wastes are disposal in environmental friendly way with strict compliance to applicable laws including adherence to MoEF guidelines with respect to the disposal of batteries, lead waste, copper cables, ash, waste oil, e-waste etc. which shall be disposed through MoEF approved parties only. The vendor shall also dispose off the e-waste generated at the end of the product life cycle at its own costs and risk as per the MoEF guidelines/ Orders

10.0 QUALITY

10.1 Knowledge of Requirements

The Associate shall be deemed to have carefully examined and to have knowledge of the equipment, the general and other conditions, specifications, schedules, drawings, etc. forming part of the Contract and also to have satisfied himself as to the nature and character of the work to be executed and the type of the equipment and duties required including wherever necessary of the site conditions and relevant matters and details. Any information thus procured or otherwise obtained from TPNODL/Consultants shall not in any way relieve the Associate from his responsibility and executing the works in accordance with the terms of contract.

10.2 Material/Equipment/Works Quality

The items / works under the scope of the Associate shall be of the best quality and workmanship according to the latest engineering practice and shall be manufactured from materials of best quality considering strength and durability for their best performance and, in any case, in accordance with the specifications set forth in this Contract. All material shall be new. Substitution of specified material or variation from the process of fabrication/ construction/ manufacture may be permitted but only with the prior written approval of the TPNODL.

10.3 Adherence to Rules & Regulations

The Associate shall procure and/or fabricate/erect all materials and equipment in accordance with all requirements of Central and State enactment, rules and regulations governing such work in India and at site. This shall not be construed as relieving the Associate from complying with any requirement of TPNODL as enumerated in the Contract which may be more rigid than and not contrary to the above mentioned rules, nor providing such construction as may be required by the above mentioned rules and regulations. In case of variance of the Technical

Specification from the laws, ordinance, rules and regulations governing the work, the Associate shall immediately notify the same to the TPNODL. It is the sole responsibility of the Associate, however, to determine that such variance exists. Wherever required by rules and regulations, the Associate shall also obtain the statutory authorities' approval for the plant, machinery and equipment to be supplied by the Associate.

10.4 Specifications and Standards

The Associate shall follow all codes and standards referred in the Contract Document. Codes and standards of other may be followed by the Associate with the prior written approval of TPNODL, provided materials, supplies and equipment according to the standard are equal to or better than the corresponding standards specified in the Contract.

Brand names mentioned in the Contract documents are for the purpose of establishing the type and quality of products to be used. The Associate shall not change the brand name and qualities of the bought out items without the prior written approval of the TPNODL. All such products and equipment shall be used or installed in strict accordance with original manufacturer's recommendations, unless otherwise directed by the TPNODL. In any circumstances the codes, specimen and standards prescribed by any government agency should not be violated.

11.0 INSPECTION/PARTICIPATION

11.1 Right to Carry Out Inspection

TPNODL reserves the right to send its representatives for inspection or participation at various stages of contract execution listed below, applicable as per contract construction.

- During basic design and detail engineering of material/ Equipment carried out by Associate /Outsourced Agencies.
- During manufacturing stages of the product at Associate's/Associate's Outsourced Agency's Plant/Facility.
- During Pre-dispatch Inspection and Testing of finished/manufactured product at Associate's/Associate's outsourced Agency's Plant/Facility.
- During Installation & Commissioning Activities/Stages.
- Prior to Clearing of the completed installation for commissioning.
- Any other stage as find appropriate by TPNODL during contract execution time.

All inspections and participations shall be carried out by TPNODL giving written intimation to the Associate or receiving appropriate advance written inspection call from the Associate, unless otherwise specified elsewhere in the contract document.

MDCC request shall be submitted by BA to TPNODL at least 7 days before inspection date.

11.2 Facilitating Inspection

The Associate shall provide all opportunities and information to TPNODL's engineers to get acquainted with the technical know-how and the methods and practices adopted by the Associate in basic and detail engineering. The Associate shall provide documents, drawings, calculations etc. as may be required by TPNODL's Engineers.

The Associate shall provide free of charge office accommodation, office facilities, secretarial services, communication facilities, general and drawing office stationary, etc. as may be

reasonably required by the TPNODL's engineers. Similarly, facilities shall also be provided by Associate's outsource agencies/partners/authorized dealers (collectively termed as sub associates) if such basic and detail engineering activities are carried out in the design offices of sub-Associates.

The Associate shall be responsible for the safety of employees of TPNODL/Third Party Agency when they are at the Associate's /Associate's outsource agency's plant or facility for carrying out/witnessing inspection/testing. All statutory safety precautions as applicable shall be followed by the Associate during Inspection Testing. If TPNODL inspectors are not satisfied with the safety arrangements at the plant, TPNODL have the right to call off inspection till such time corrective action is taken by the Associate.
Before raising the call for pre-dispatch final inspection and testing, the Associate shall conduct all the tests—type tests, routine tests etc-as specified in the contract document and submit copies of the test certificates to TPNODL along with the inspection call, for scrutiny of TPNODL.

The Associate and TPNODL shall jointly document all the observations, comments and action points after completion of inspection and it shall be binding on the Associate to provide compliance on all the points requiring compliance and furnish the compliance report to the designated authority of TPNODL for receiving clearance for dispatch of materials

11.3 Third Party Nomination

TPNODL also may nominate a third party for the purpose of carrying out the inspection and such an agency shall be entitled to all the rights and privileges of TPNODL as far as conducting the inspection.

11.4 Waiver of Inspections

TPNODL on its own discretion shall chose to waive off any inspection and ask the Associate to submit all the test reports as applicable as per contract specifications, related to inspection and testing of the goods ordered for scrutiny and clearance for dispatch.

11.5 Incorrect Inspection Call

In case it is observed that the material offered for inspection is not ready at the time of TPNODL inspection visit rendering it as futile, all costs towards such inspection shall be recovered from the BA. Taxes as applicable on such recoveries shall be borne by the BA.

12.0 MDCC & DELIVERY OF MATERIALS

12.1 Material Dispatch Clearance Certificate

Associate shall deliver material/goods/equipment against Supply Contracts or Supply Part of Composite/Service Contracts only after receiving Material Dispatch Clearance Certificate (hereafter termed as MDCC) issued by designated authority of TPNODL. Material delivered at TPNODL stores or at project site without a valid MDCC issued by the designated official of TPNODL shall be rejected. MDCC shall be issued to associate furnishing compliance report on the action points documented during pre-dispatch inspection and testing at Associate's/ Sub Associate's plant/ facility. In case Pre-dispatch inspection is waived at the discretion of TPNODL, then, MDCC shall be issued on receiving all the test reports-routine& type-from the Associate and finding them in order.

The associate shall include and provide for securely protecting and packing the materials so as to avoid loss or damage during handling and transport by air, sea, rail and road or any other means.

All such packing shall allow to the extent possible for easy removal and checking at Site. The associate shall take special precautions to prevent rusting of steel and iron parts during transit by sea. Gas seals or other materials shall be utilized by the associate for protection against moisture during transit of all Plant and Equipment.

Each Equipment or parts of Equipment shall be tagged with reference to the assembly drawings and corresponding part numbers. Each bale or package shall contain a packing note quoting specifically the name of the associate, item description, quantity, item / package identification.

All packing cases, containers, packing and other similar materials shall be new and supplied free by the associate and it shall not be required to be returned to the associate.
Notwithstanding anything stated in this clause, the associate shall be entirely responsible for loss, damage or depreciation or deterioration to the materials and supplies due to faulty and/or insecure packing or otherwise during transportation to the Site until otherwise provided herein.

In case of the consignments dispatched by road, the associate shall ensure that it or its subcontractors:

i) Identify and obtain the correct type of trucks/trailers, keeping in view the nature of consignments to be dispatched.

ii) Take such actions as may be necessary to avoid all possible chances of damages during transit and to ensure that all packages are firmly secured.

Timelines for inspection and MDCC is as below:

S. No.	Inspection	MDCC issuance time including Inspection time (max.)
1	Outside Odisha	12 days
2	Within Odisha	5 days
3	Waiver*	3 working days

* Associate is expected to raise the inspection call assuming that Inspection shall be carried out by TPNODL. The decision for waiver of inspection shall be on sole discretion of TPNODL.

12.2 Right to Rejection on Receipt

Goods/Material/Equipment delivered in condition physically damaged & incomplete as a product ordered, or not packed and transported as per the terms and conditions of the contract is liable to be rejected. Such item shall be lifted back by Associates within 15 days from receipt of rejection note from TPNODL and have to supply back the material within next 30 days or within the timeframe mutually decided by Associate and TPNODL.

If delivery of the material is beyond the agreed time, Liquidated damage clause, mentioned in this GCC separately shall be applicable; but the period for levy of LD shall be considered as per the original delivery schedule and not from the agreed timelines for material rectification.

12.3 Consignee

Unless otherwise specified in the Contract Document, Materials/Goods/Equipment shall be consigned to “Stores-In-Charge”, TPNODL, Balasore/ Jajpur/ others.

12.4 Submission of mandatory documents on Delivery

Following documents shall be mandatorily submitted by BA along with supply of material to TPNODL stores/site:

S. No.	Documents	Requisite
1	Invoice copy in original	With all consignments
2	LR copy	Wherever required
3	Packing list	With all consignments
4	MDCC	With all consignments
5	Purchase order / Release order	Signed copy
6	Test certificates	With all consignments
7	Inspection/JVR report	In case pre-dispatch inspection is conducted
8	Device data in CD as per template for metering items	Wherever applicable

12.5 Dispatch and Delivery Instructions

S. No.	Instructions
1	Purchase order/ Release order no. shall be mentioned on invoice and on material
2	TPNODL material code and material description shall be mentioned in invoice and on material.
3	“Property of TPNODL” shall be embossed on material.
4	The material shall be properly sealed and packed in standard packing as per purchase order terms & conditions.
5	The weight and quantity of material shall be mentioned wherever applicable
6	The material supplied shall be co-related with the packing list.
7	The name plate detail on equipment shall include Material code, Material description, specification detail of material [as applicable], Serial No. Year of manufacturing, PO/RO no. and date, “PROPERTY OF TPNODL”, Guarantee period and Associate’s name.
8	In case of manual unloading, supplier / transporter shall deploy sufficient Labour for unloading the material at TPNODL central store. For heavy item(s), crane shall be arrange by the BA. However, in case, BA is not able to arrange the Crane, then TPNODL reserve the rights to hire the crane from market/ within internal resources and all expenditure/ unloading shall be recovered from BA.
9	The driver should have valid License and one helper in truck. All the documents of truck like registration papers, PUC etc. should be available in Truck.
10	BA representative should accompany the material and get it unloaded / stacked in his presence wherever possible.

13.0 GUARANTEE

13.1 Guarantee of Performance

Associates shall stand guarantee that the equipment and material supplied under the contract is free from design, manufacturing, material, construction, erection & installation and workmanship & quality defects and is capable of its due, rated and intended quality

performance, as an integrated product delivered under the contract, for a specific period termed as Guarantee Period(as elaborated elsewhere in this clause). The Associate should also guarantee that the equipment/material is new and unused except for the usage required for the tests and checks required as part of quality assurance.

13.2 Guarantee Period

The Guarantee Period will be equipment/service/work specific and shall be as specified in the Standard Specifications of TPNODL for the equipment/material/service/work and where standard specifications are not part of contract documents or guarantee period is not specified in the standard specifications,, the guarantee period shall be as per the Special Terms and Conditions of the Contract. In case of no mention of the guarantee period in standard specifications or SCC Guarantee Period will be 12 Months from the Date of Commissioning or 24 months from the date of delivery of final lot of supplies made, whichever is earlier.

13.3 Failure in Guarantee Period (GP)

If the equipment and material supplied under the contract fails to perform its due, rated & intended quality performance, during the Guarantee period, the associate is liable to undertake repair/rectify/replace the equipment and material supplied within time frame specified in the SCC or elsewhere in the contract documents at associate's cost to make the equipment and material supplied/service or work rendered under the contract of performing its due, rated and intended quality performance. If Associate fails to repair/rectify/replace the equipment or material supplied rendered under the contract, failed in Guarantee Period, TPNODL will be at liberty to get the same done at Associate's risks and costs and recover all such expenses plus the TPNODL's own charges (@ 20% of expenses incurred), from the Associate or from the "Security cum Performance Deposit" as the case may be.

If during the Warranty/ Guarantee period some parts of the supplies are replaced owing to the defects/ damages under the Warranty, the Warranty period for such replaced parts shall be until the expiry of twelve months from the date of such replacement or renewal or until the end of original Guarantee period, whichever is later.

Any repairs during the Guarantee Period shall be carried out by the Associate within 30 days of reporting the issue to Associate by TPNODL. However, if replacement of the Equipment is required, Associate shall notify the same to TPNODL within 7 days of reporting the issue by TPNODL. Thereafter, the total time for supply of new equipment/ material shall be equal to the original delivery period of that equipment/ material as specified in the Contract. In case the Associate is not able to rectify/ replace the faulty equipment/ material within the stipulated timelines as mentioned above, penalty shall be levied as per the Liquidated Damages clause mentioned in this document. The penalty amount shall be recovered from the payment due to the vendor or by encashment of the SPBG as the case may be.

13.4 Cost of repairs on failure in GP

The cost of repairs/rectification/replacement, required transportation, site inspection /mobilization/dismantling and re-installation costs as applicable, to be borne by Associate. The Associate has to ensure that the interruption in the usage of intended purpose of the equipment is minimized to the maximum extent In lieu of the time taken for repairs/rectification/replacement.

13.5 Guarantee period for Goods Outsourced

If the Associate outsources partly equipment/materials/services from third party as mutually agreed upon at the pre award stage of contract, TPNODL shall have the benefit of any additional guarantee period if provided by the third party for the part supplied/executed by them.

13.6 Latent Defect

Hidden defects in manufacturing or design of the product supplied and which could not be identified by the tests conducted but later manifested during operation of the equipment are termed as latent defects. Associates shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Company.

13.7 Support beyond the Guarantee Period

The Associate shall ensure availability of spares and necessary support for a period of atleast 10 years post completion of guarantee period of equipment supplied against the contract.

14.0 LIQUIDATED DAMAGES

a) For supplies which are of standalone use, multiple in quantities and having a single final delivery schedule, Liquidated damages shall be levied without prejudice to any of the other contractual rights of TPNODL, as described below:

   For delay of each week and part thereof from the delivery schedule specified in the contract, 1% of contract value corresponding to undelivered quantity, provided full quantity is supplied within 130% of the original contract time. If full contractual quantity is not delivered within 130% of contract time for delivery, TPNODL has the right to levy LD on the entire contract value, subject to a maximum of 10% of the total contract value.

b) For Supplies having phased delivery schedule as per contract terms, standalone use and multiple in quantities, Liquidated damages shall be levied without prejudice to any of the other contractual rights of TPNODL, as described below:

For the purpose of calculating and applying LD, each delivery lot shall be considered separately. For delay of each week and part thereof, from the delivery schedule specified for the lot, 1% of the contract value corresponding to the undelivered quantity of the lot subject to a maximum of 10% of the total contract value of the subject lot. However, if full contractual quantity is not delivered within 130% of contract time for delivery, TPNODL has the right to levy LD on the entire contract value, subject to a maximum of 10% of the total contract value. Deduction of LD shall be on landed cost i.e contract value inclusive of taxes and in pursuant statutory compliance GST would be applicable at the stipulated rate and the same shall be borne by Business Associate. In case of LD deduction, a GST invoice shall be issued by TPNODL as a proof of deduction/ recovery.

14.1 LD Waiver Request

Any request of LD waiver shall be submitted within thirty (30) days of deducting LD. Request submitted beyond the timeline shall not be entertained.

15.0 UNLAWFUL ACTIVITIES

The Associate shall have to ensure that none of its employees are engaged in any unlawful activities (whether covered under the scope of the present GCC or not) subversive of the

TPNODL's interest failing which appropriate action (legal or otherwise) may be taken against the Associate by the TPNODL, in accordance with the terms of the present GCC.

16.0 CONFIDENTIALITY

Associate and its employees or representatives thereof shall strictly maintain the confidentiality of various information they come across while executing the contract as detailed below.

16.1 Documents

All maps, plans, drawings, specifications, schemes and other documents or information related to the Contract/Project and the subject matter contained therein and all other information given to the Associate by the TPNODL in connection with the performance of the contract shall be held confidential by the Associate and shall remain the property of the TPNODL and shall not be used or disclosed to third parties by the Associate for any purpose other than for which they have been supplied or prepared. The Associate may disclose to third parties, upon execution of confidentiality agreements, such part of the drawings, specifications or information if such disclosure is necessary for the performance of the Work provided such third parties agree in writing to keep such information confidential to the same extent and degree as provided herein, for the benefit of the TPNODL.

16.2 Geographical Data

Maps, layouts and photographs of the unit/plant including its surrounding regions showing vital installation for national security of country or those of TPNODL shall not be published or disclosed to the third parties or taken out of the country without prior written approval of the TPNODL and upon execution of confidentiality agreements satisfactory to the TPNODL with such third parties prior to disclosure.

16.3 Associate's Processes

Title to secret processes if any developed by the Associate on an exclusive basis and employed in the design of the equipment shall remain with the Associate. TPNODL shall hold in confidence such processes and shall not disclose such processes to the third parties without prior approval of the Associate and execution by such third parties of secrecy agreements satisfactory to the Associate prior to disclosure. Upon completion of contract, such processes shall become the property of the TPNODL. Title to technical specifications, drawings, flow sheets, norms, calculations, diagrams, interpretations of test results, schematics, layouts and such other information, which the Associate has supplied to the TPNODL under the Contract shall be passed on to the TPNODL. The TPNODL shall have the right to use these for construction, erection, start-up, Trial Run, operation, maintenance, modifications and/or expansion of the works including for the manufacture of spare parts.

16.4 Exclusions

The provision of Clauses 16.1 to 16.3 shall not apply to information:

- Which at the time of disclosure are in the public domain which later on become part of public domain through no fault of the party concerned, or
- Which were in the possession of the party concerned prior to disclosure to him by the other party, or
- Which were received by the party concerned after the time of disclosure without restriction on disclosure or use, from a third party who did not acquire such information

directly or indirectly from the other party or has no obligation of confidentiality for such information.

16.5 Violation

In case of violation of this clause, the Associate is liable to pay compensation and damages as may be determined by the competent authority of TPNODL.

17.0 INTELLECTUAL PROPERTY RIGHTS

If, in the course of performance of its functions and duties as envisaged by the scope of the present GCC, the Associate acquires or develops, any unique knowledge or information which would be covered, or, is likely to be covered within the definition of a trademark, copyright, patent, business secret, geographical indication or any other form of intellectual property right, it shall be obliged, under the terms of this present GCC, to share such knowledge or information with the TPNODL. All rights, with respect to, or arising from such intellectual property, as afore mentioned, shall solely vest in TPNODL.
Moreover, the Associate undertakes not to breach any intellectual property right vesting in a third party/parties, whether by breach of statutory provision, passing off, or otherwise. In the event of any such breach, the Associate shall be wholly liable to compensate, indemnify or make good any loss suffered by such third party/parties, or any compensation/damages arising from any legal proceeding/s, or otherwise. No liability of TPNODL shall arise in this respect, and any costs, damages, expenses, compensation payable by TPNODL in this regard to a third party/parties, arising from a legal proceeding/s or otherwise, shall be recoverable from the Associate.

18.0 INDEMNITY

The Associate shall at all times indemnify, keep indemnified and hold harmless the TPNODL and its officers, directors, employees, affiliates, agents, successors and assigns against all actions, claims, demands, costs, charges and expenses arising from or incurred by reason of any infringement of patent, trade mark, registered design, copy rights and/or industrial property rights by manufacture, sale or use of the equipment supplied by the Associate whether or not the TPNODL is held liable for by any court judgement. In this connection, the TPNODL shall pass on all claims made against him to the Associate for settlement.

The Associate assumes responsibility for and shall indemnify and save harmless the TPNODL from all liability, claims, costs, expenses, taxes and assessments including penalties, punitive damages, attorney's fees and court costs which are or may be required to be paid by the TPNODL and its officers, directors, employees, affiliates, agents, successors and assigns arising from any breach of the Associate's obligations under the Contract or for which the Associate has assumed responsibilities under the Contract including those imposed under any local or national law or laws, or in respect to all salaries, wages or other compensation for all persons employed by the Associate or his Sub-Associates or suppliers in connection with the performance of any work covered by the Contract. The Associate shall execute, deliver and shall cause his Sub-Associate and suppliers to execute and deliver, such other further instruments and to comply with all the requirements of such laws and regulation as may be necessary there under to conform and effectuate the Contract and to protect the TPNODL.

The TPNODL shall not be held responsible for any accident or damages incurred or claims arising, due to the Associate's error there from prior to completion of work. The Associate shall be liable for such accidents and after completion of work for such accidents as the case may be

due to negligence on his part to carry out Work in accordance with Indian laws and regulations and the specifications set forth herein.

19.0 LIABILITY & LIMITATIONS

19.1 Liability

Except for any specific liability which may be identified in the Contract and which may be payable hereunder, Associate shall not be liable for any special, incidental, indirect, or consequential Damages or any loss of business Contracts, revenues or other financial loss (or equivalents thereof no matter how claimed, computed or characterized) arising out of or in connection with the Performance of the Work or supply of Goods ***unless caused by Associate's negligence, willful misconduct or breach of contract.***

If the Associate is a joint venture or consortium, all concerned parties shall be jointly and severally bound to the TPNODL for the fulfillment of the provisions of the Contract. The consortium or the joint venture shall designate one party as their leader, who will be the coordinator between the parties and TPNODL. The constituents & leader of the consortium or joint venture shall not be changed without the prior consent of TPNODL.

TPNODL shall have no liability or any special, incidental, indirect or consequential Damages for any loss of Business Contracts, revenues or other financial loss arising out of this Contract.

19.2 Limitation of Liability

The total liability of Associate against any contract shall be limited to the Total All Inclusive Contract Value.

20.0 FORCE MAJEURE

Force Majeure applies if the performance by either Party ("the Affected Party") of its obligations under Contract is materially and adversely affected.

"Force Majeure" shall mean any event or circumstance or combination of events or circumstances referred below and their consequences that wholly or partly prevents or unavoidably delays any Party in the performance of its obligations under this Agreement, but only and to the extent that such events and circumstances are not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided even if the Affected Party had taken reasonable care:

- Act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, embargo, blockade, revolution, riot, bombs, religious strife or civil commotion, etc. ▪ Politically motivated sabotage, or terrorism, etc.
- Action or Act of Government or Governmental agency for which remedy is beyond the control of the affected parties. ▪ Any act of God.

Note: Causes like power breakdown/ shortages/fire/strikes, accidents etc do not fall under Force Majeure.

Time being the essence of the Contract, if either party is prevented from the performance of its obligations in whole or in part due to an event of Force Majeure, then provided Notice of happening of any event by the Affected Party is given to the other party within seven (7) days from the date of occurrence of such event, which DIRECTLY has impact on works and submitted details and quantum of resulting effect, but at the same time had made all possible efforts to mitigate and overcome effects thereof, the Affected Party's performance under this

Contract shall be suspended until such event ceases and the Scheduled Completion shall be delayed accordingly.

If Force Majeure event(s) continue for a period of more than three months, the parties shall hold consultation to discuss the further course of action.

Neither party shall be considered to be in default or in breach of its obligation under the Contract to the extent that performance of such obligation by either party is prevented by any circumstances of Force Majeure which arise after effective date of Contract.

Neither party can claim any compensation from the other party on account of Force Majeure.

21.0 SUSPENSION OF CONTRACT

21.1 Suspension for Convenience

TPNODL may, at any time and at its sole option, suspend execution of all or any portions of the schedule of items of contract to be supplied/work to executed by Associate under the contract by providing to the Associate atleast two business days written notice for contracts having contract completion period less than sixty days and atleast seven business days' notice for all other contracts.

Upon receipt of any such notice, the Associate shall respond as follows as applicable as per contract construction.

- Immediately discontinue further supply of material/goods specified in the suspension notice for supply contracts
- Immediately discontinue further service/work and supply of materials of those services/materials/work specified in the suspension notice for service /composite contract
- Promptly make every reasonable effort to obtain suspension, upon terms satisfactory to TPNODL, of all orders, outsourcing arrangements, and rental Contracts to the extent that they relate to performance of the portion of Work suspended by the notice.
- Protect and maintain the portion of the service/Work already completed, including the portion of the Work suspended hereunder, unless otherwise specifically stated in the notice.
- Continue delivering/carrying out the supply/service/work items as per contract conditions, which do not fall under purview of the suspension notice.

On receipt of resumption notice from TPNODL, the Associate shall resume execution of contract as specified in the resumption notice, within the time frame specified in the resumption notice.

21.2 Suspension for Breach of Contract conditions.

TPNODL shall suspend execution of whole/or part thereof the contract till such time Associate complies with the conditions stipulated under section clause 22.1 for breach/default of contract conditions.

21.3 Compensation in lieu of Suspension

If the suspension of the contract in whole or in part is for convenience of TPNODL and not due to any breach of contract conditions by the associate, TPNODL at its discretion shall consider compensating all reasonable additional costs incurred by Associate in lieu of suspension of

whole or part of contract, on representation of the Associate providing justified estimates of such additional costs and such estimates are found acceptable and approved by competent authority of TPNODL.

If the suspension of contract in whole or part thereof is due to breach of contract conditions (refer clause 22.1) by the Associate, Associate shall not be entitled for any compensation for any cost incurred in lieu of suspension of whole or part of contract and also shall be liable for compensating all the losses arising to TPNODL in lieu of suspension of contract. Resumption notice shall be subject to the Associate taking corrective action for the breach of contract conditions within the time frame and as per the terms specified in the suspension notice.

22 TERMINATION OF CONTRACT

22.1 Termination for Default/Breach of Contract

The contract / PO /RC shall be subject to termination by TPNODL in case of breach of the contract by the Associate which shall include but not be limited to the following:

a. Withdrawal or intimation by the Associate of its intent to withdraw or surrender the execution / completion of the contracted work /PO or failure in ensuring adherence to any delivery schedules, in deviation of the contract/PO.

b. Refusal or neglect on the part of the Associate to supply material/equipment of quantity or quality as specified by TPNODL and within the timeframe as specified in the contract document or refusal or neglect to execute the services/work in terms of the agreed standards of quantity or quality and/or within the timeframe specified in the contract/PO.

c. Failure in any respect to perform any portion of the Work contracted with promptness, diligence, or in accordance with the terms of the contract.

d. Failure to furnish guarantees as specified and /or failure to comply with the terms thereof.

e. Failure to furnish such relevant documents or information within the time specified which may be necessary for due execution / completion of the works and documentation.

f. Liquidation, bankruptcy either voluntary or involuntary OR entering into any composition or compromise with its creditors, or Insolvency.

g. In case any reasonable information has been received by TPNODL that Associate has adopted/ or attempted to adopt any unethical conduct, action in award of the contract /PO or at any time thereafter.

h. Failure to comply with applicable statutory provisions as contained in the contract or failure to comply with the applicable laws.

i. Failure to comply with safety regulations/clauses stipulated in the contract or as may be generally instructed by TPNODL.

If the default or breach as specified under clause 22 (except sub clause g thereof) be committed by the associate for the first time, TPNODL shall issue, along the with notice of default or breach, a warning notice instructing the associate to take remedial/corrective action within the time frame stipulated in the warning notice and not to repeat the same in future. The timeframe for corrective action by the associate shall be specific to the nature of breach of contract and the same shall not be objected to by the Associate. If the Associate fails to comply with the instructions in the warning notice or in taking corrective action to the satisfaction of

TPNODL then TPNODL may terminate the entire or part of contract at its discretion by issuing termination notice without incurring any liability on this ground.

In case the contract is terminated for any breach of the nature specified in clause 22 g stated above, TPNODL shall have the right to terminate all the contracts TPNODL is having with the Associate by issuing termination notice which shall be without prejudice to the other rights of TPNODL available to it under law.
Without prejudice to its right to terminate for breach of contract, TPNODL may, without assigning any reason, terminate the Contract in whole or in part at any time at its discretion while the contract is in force by serving a written notice of two weeks to the Associate.

In the event of TPNODL having proceeded with termination of the contract the associate shall comply and proceed further in the following manner:

a) Associate shall discontinue the supply, on the expiry of the said period of two weeks.

b) Associate shall ensure that no further steps are being taken towards discharge of the obligations, terms and conditions as contained in the contract/PO. This shall include initiation of actions not limited to discontinuation of other allied and associated arrangements which the associate might have entered into with third parties for due discharge of its obligations under the contract with TPNODL.

c) The Associate shall perform thereafter such tasks as may be necessary to preserve and protect the terminated portion of the material/service/work in progress and the materials and equipment at TPNODL sites or in transit thereto. However the associate shall continue to fulfill its contractual obligations with regard to the part of contract not terminated.

d) It shall be open for TPNODL to conduct a joint assessment with the associate of the material, supplies, equipment ,works or in general as to the subject matter of the contract in regard to which the associate claims having completed its obligations before or during such termination.

e) It shall be open to TPNODL to seek invocation of the performance bank guarantee or any other guarantee or other security deposit by whatever name called submitted by the associate, which shall not be objected to or protested against by the associate.

In case of termination of the contract the parties agree to be governed inter alia by the following:

a) In case TPNODL exercises its right of termination as stated above the associate shall not dispute or object to the same.

b) The Associate shall be entitled to receive and claim only such payments OR sums of money from TPNODL as may be found payable to it in regard to works executed by it under the terms of the contract and no other claim of any nature whatsoever shall be made by the Associate.

c) All such provisions which the parties have agreed to survive and prevail even after termination of the contract shall remain effective despite the termination.

In the event of such termination, TPNODL may finish the Work by whatever method it may deem expedient, including the hiring of services and /or purchase of material equipment from such third parties as TPNODL may deem fit or may itself provide any labor or materials and

perform any part of the Work. The associate undertakes to bear the incremental costs if any paid by TPNODL in such a case attributable to failure on the part of the associate. The Associate in such a case shall not be entitled to receive any further payments and any sums found payable to it may be adjusted by TPNODL against the amount recoverable from him on this ground. The same shall be without prejudice to other rights available to TPNODL under law against the associate.

Upon the termination of any of the contract due to occurrence of any circumstances provided in clauses stated above and constituting repeated breach or misconduct , TPNODL shall be entitled to bar the associates its agents , affiliates from undertaking any negotiation / tendering, bidding , participation activities concerning TPNODL for a period of two years from date of such termination. The same shall be without prejudice to other rights available to TPNODL.

22.2 Termination for Convenience of Associate

Associate at its convenience may request for termination of contract, clearly assigning the reason for such request. TPNODL has full right to accept, reject or partially accept such request. However, associate shall continue its supply as per contract till final approval is given to associates for such termination.

22.3 Termination for Convenience of TPNODL

TPNODL at its sole discretion may terminate the contract by giving 30 days prior notice in writing or through email to the Associate. TPNODL shall pay the Associate for all the supplies/ services rendered till the actual date of contract termination against submission of invoice by the Associate to that effect.

23.0 DISPUTE RESOLUTION & ARBITRATION

In case of any dispute or difference the parties shall endeavour to resolve the same through conciliatory and amicable measures within 15 Days failing which the matter may be referred by either party for resolution by the sole arbitrator to be appointed mutually by both the parties. The arbitral proceedings shall be conducted in accordance with Arbitration and Conciliation Act 1996 and the place of arbitration shall be Bhubaneswar. The language to be used at proceedings shall be English and the award of the arbitrator shall be final and binding on the parties. The parties shall bear their respective costs of arbitration. The associate shall continue to discharge its obligations towards due performance of the works as per the terms of the contract during the arbitration proceedings unless otherwise directed in writing by TPNODL or suspended by the arbitrator. Further, TPNODL shall continue making such payments as may be found due and payable to the associate for such works.

23.1 Governing Laws and Jurisdiction

The parties shall be subject to the jurisdiction of the courts of law in Bhubaneswar and any matter arising here from shall be subject to applicable law in force in India.

24.0 ATTRIBUTES OF GCC

24.1 Cancellation

The Company reserves the right to cancel, add, delete at its sole discretion, all or any terms of this GCC or any contract, order or terms agreed between the parties in pursuance without assigning any reasons and without any compensation to the Associates.

24.2 Severability

If any portion of this GCC is held to be void, invalid, or otherwise unenforceable, in whole or part, the remaining portions of this GCC shall remain in effect.

24.3 Order of Priority

In case of any discrepancies between the stipulations in General Conditions of the Contract (GCC) and Special Conditions of Contract (SCC), the GCC shall stand superseded by the SCC to the extent stipulated hereinabove while balance portion of respective clauses of GCC shall continue to be applicable.

25.0 ERRORS AND OMISSIONS

The Associate shall be responsible for all discrepancies, errors and omissions in the drawings, documents or other information submitted by him, irrespective of whether these have been approved, reviewed or otherwise accepted by the TPNODL or not. However any error in design/drawing arising out of any incorrect data/written information from TPNODL will not be considered as error and omissions on part of the Associate.

26.0 TRANSFER OF TITLES

The title of ownership and property to all equipment, materials, drawings & documents shall pass to the TPNODL on acceptance of material by store/site after Inspection.

However, such passing of title of ownership and property to the TPNODL shall not in any way absolve, dilute or diminish the responsibility and obligations of the Associate under this Contract including loss or damages and all risks, which shall vest with the Associate.

27.0 INSURANCE

The Contractor shall take out the Insurance Policies which shall cover all risks including the following, as applicable:-

a) The value of the policy shall cover the total value of all the items till they are handed over to TPNODL.

b) TPNODL shall be the principal holder of the policy. The Associate shall be the loss payee under the policy. Associate / Sub-contractor of the Associate shall not be holders or beneficiaries in the policy nor shall they be named in the policy. TPNODL reserves the exclusive right to assign the policy.

c) While the payment of premium may be phased in agreement with the insurance company, at no time shall goods and services required to be provided by the associate shall remain uninsured in accordance with (a) above.

d) A copy of the Insurance policy shall be made available to TPNODL prior to first dispatch lot of any Equipment and policy shall be kept alive and valid at all times up to the stage of final acceptance.

e) TPNODL reserves the right to take out whatever policy that is deemed necessary by him if the associate fails to keep the said policy alive and valid at all times and/or causes lapses in payment of premium thereby jeopardizing the said policy. The cost of such policy(s) shall be recovered / deducted from the amount payable to the associate.

f) The policy shall ensure that the TPNODL's decision regarding replacement of goods damaged, lost or rendered unusable shall be final.

In all cases, the associate shall lodge the claims with the underwriters and also settle the claims and shall also notify TPNODL of any filed claims. However, the associate shall proceed with the repairs and/or replacement of the equipment/components without waiting for the settlement of the claims. In case of seizure of materials by concerned authorities, the associate shall arrange prompt release against bond, security or cash as required. TPNODL, upon request by the associate, will extend all reasonable assistance to the associate in such a case.

All the insurance claims shall be processed and settled by the associate and the missing/damaged items shall be replaced/repaired by them without any extra cost to TPNODL and without affecting the completion time.

28.0 SUGGESTIONS & FEEDBACK

We welcome all our Business Associates to write to us about their experience with TPNODL; be it our Company, our services or our people. Each and every concern, issue, query and suggestion from you will help us to become a better company to work with and shall help us develop a strong bonding of trust and a long term relationship with you.

You may send your feedback to HOD Contracts by filling up our Business Associate Feedback Form enclosed herewith as *Annexure-I.*

29.0 CONTACT POINTS

In case Business Associate needs information with respect to payments or has any grievances, he may contact to HoD-Contracts and Finance.

30.0 LIST OF ANNEXURES

S. No.	Subject	Annexure
1.	Performa for Bid Security Bank Guarantee	A
2.	Performa for Performance Bank Guarantee (CP cum EP)	B
3.	Performa for No Demand Certificate by Associate	C
4.	Performa For Application For Issuance of Consolidated TDS Certificate	D
5.	Business Associate Feedback Form	E
6.	Acceptance Form For Participation In Reverse Auction Event	F
7.	Form for RTGS Payment	G
8.	Vendor Appraisal Form	H
9.	Manufacturer Authorization Form	I
10.	Tata Code of Conduct	I

ANNEXURE-A

Approved Copy of GCC (TPNODL)-Rev01

PROFORMA FOR BID SECURITY BANK GUARANTEE

TP Northern Odisha Distribution Limited
Balasore

WHEREAS, (Name of the Bidder) _____

(hereinafter called "the BIDDER") has submitted his bid dated_____ for the (Tender No. & Name of Contract) _____ (hereinafter called "the BID").

KNOW ALL men by these presents we (Name of the Bank) _____ of (Name of the Country) _____ having our registered office at_____(hereinafter called "the BANK) are bound unto TPNODL in the sum of _____ for which payment well and truly to be made to the TPNODL the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 20_____.

The CONDITIONS of this obligation are**:**

i) If the Bidder withdraws his Bid during the period of bid validity specified in the Proforma of Bid or

ii) If the Bidder having been notified of the acceptance of his Bid by the TPNODL during the period of bid validity fails or refuses to furnish the Contract Performance Bank Guarantee, in accordance with the Instructions to Bidders.

We undertake to pay the TPNODL upto the above amount upon receipt of its first written demand, provided that in its demand the TPNODL will note that amount claimed by it is due to it owing to the occurrence of one or both conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force upto and including the date (No of days as mentioned in tender enquiry) days after the closing date of submission of bids as stated in the Invitation to Bid or as extended by you at any time prior to this date, notice of which extension to the Bank being hereby waived, and any demand in respect thereof should reach the Bank not later than the above date.

DATE …… SIGNATURE OF THE BANK ……..
WITNESS …… SEAL ……..
(Signature, Name & Address) (At least 2 witnesses)

ANNEXURE- B

PROFORMA FOR PERFORMANCE BANK GUARANTEE (CP cum EP)

(On Rs.100/- Stamp Paper) Note:

a) Format shall be followed in toto
b) Claim period of six months must be kept up

c) The guarantee to be accompanied by the covering letter from the bank confirming the signature to the guarantee

---

TP Northern Odisha Distribution Ltd.

Balasore

CP cum EP BG No…….

Order/Contract No……dated……

1. You have entered into a Contract No _____ with M/s._____ (hereinafter referred to as "the Vendor") for the supply cum erection / civil work of _____ (hereinafter referred to as" the said Equipment") for the price and on the terms and conditions contained in the said contract.
2. In accordance with the terms of the said contract, "the Vendor" agreed to furnish you with an irrevocable, unconditional and acceptable bank guarantee for 10% of the value of contract and to be valid till the end of Guarantee period plus one month towards "Contract cum Equipment performance". For this purpose you have agreed to accept the guarantee.
3. In consideration thereof, we, _____ hereby irrevocably and unconditionally guarantee to pay to you on demand but in any case before the end of five working days from the date of the claim and without demur and without reference to "the Vendor" such amount or amounts not exceeding the sum of Rs._____ (Rupees _____ only) being _____% (_____ percent) of the total value of the contract on receipt of your intimating that "the Vendor" has not fulfilled his contractual obligations. You shall be the sole judge for such non-fulfillment and "the Vendor" shall have no right to question such judgment.
4. You shall have the right to file / make your claim on us under the guarantee for a **further period of one month** from the date of expiry.
5. This guarantee shall not be revoked without express consent and shall not be affected by your granting time or any other indulgence to "the Vendor", which shall include but not be limited to, postponement from time to time of the exercise the same in you or any right which you may have against "the Vendor" and to exercise the same in any covenant contained or implied in the said contract or any other course or remedy or security available to you, and our Bank shall not be released from its obligations under this guarantee by

your exercising any of your rights with reference to matters aforesaid or any of them or by reasons of any other act or forbearance or other acts of omission or commission on your part or any other indulgence shown by you or by any other matter or thing whatsoever which under the law would, but for this provision have the effect of relieving our bank from its obligation under this guarantee.

6. We also agree that you shall be entitled at your option to enforce this guarantee against our bank as a principal debtor, in the first instance, notwithstanding any other security or guarantee that you may have in relation to “the Vendor’s” liabilities in respect of the premises

7. This guarantee shall not be affected by any change in the constitution of our Bank or “the Vendor” or for any other reason whatsoever.

8. Any claim / extension under the guarantee can be lodge-able at outstation banks or at Balasore branch and claim will also be payable at Balasore Branch (to be confirmed by Balasore Branch by a letter to that effect in case BG is from the branch outside Balasore).

9. Notwithstanding anything herein contained, our liability under this guarantee is limited to Rs._____ (Rupees_____ only and the guarantee will remain in force upto and including _____(Date) and shall be extended from time to time for such period or period as may be desired by “the Vendor”.

10. Unless a demand or claim under this guarantee is received by us in writing within six months from_____ (expiry date) i.e. on or before _____ (claim period end date), we shall be discharged from all liabilities under this guarantee thereafter.

Dated at_____ this_____ day of _____ 20__

Bank’s rubber stamp

1. Banks full address

Designation of Signatory

2. Bank official number

ANNEXURE-C

PROFORMA FOR "NO DEMAND CERTIFICATE" BY ASSOCIATE

(On Company's Letter head or with Company Seal)
(To be submitted by the Associate to TPNODL Accounts Department at the time of receipt of full and final payment)

(Certificate No. CCP/002)

Name of the Project Order/

Contract No.

Dated

Name of the Associate Scheme

No. / Job No.

We, M/s._____ (Associate) do hereby acknowledge and confirm that we have received the full and final payment due and payable to us from TPNODL, in respect of our aforesaid Order No _____ dated_____ including amendments, if any, issued by TPNODL to our entire satisfaction and we further confirm that we have no claim whatsoever pending with TPNODL under the said contract / W.O.

Notwithstanding any protest recorded by us in any correspondence, documents, measurement books and / or final bills etc., we waive all our rights to lodge any claim or protest in future under this contract.

We are issuing this "NO DEMAND CERTIFICATE" in favour of TPNODL, with full knowledge and with our free consent without any undue influence, misrepresentation, coercion etc.

Place **Name**

(Company Seal)

ANNEXURE-D

PROFORMA FOR APPLICATION FOR ISSUANCE OF CONSOLIDATED TDS CERTIFICATE

To be printed on the letterhead

To,

TPNODL,

Balasore

Sub: Application for issuance of Consolidated TDS Certificate for the FY _____

Dear Sir,

I / we hereby request / authorize you to issue me / us a consolidate TDS Certificate for the financial year _____ against tax deducted at source by you from my / our payments / bills during the said year from time to time under Chapter XVII – B of the Income Tax Act, 1961.
For and on behalf of

Signature

Name

Address

Contact No. (Land Line)

(Mobile)

PAN #

Assessing authority

ATTACH THE COPY OF PAN CARD

ANNEXURE-E

BUSINESS ASSOCIATE FEEDBACK FORM

With an objective to improve our internal processes and systems, and serve you better, we solicit your valuable feedback & suggestions. It is estimated that it will take about 10 minutes to complete this survey. We assure you that your feedback shall be kept confidential. Please send the duly filled feedback form in the "TPNODL addressed - attached envelop"

You are associated with us as

☐ OEMs ☐ Service Contractor ☐ Material Suppliers ☐ Material & Manpower Supplier

You are associated with us for

☐ Less than 1 year ☐ More than 1 year but less than 3 years ☐ More than 3 years

Your office is located at

☐ Balsore ☐ Within 200 kms from Balsore ☐ More than 200 kms from Balsore

Your nearly turnover with TPNODL

☐ Less than 25 Lacs ☐ 25 Lacs to 1 Crore ☐ More than 1 Cr.

Additional Information

Your Name	
Your Designation	
Your Organization	
Contact Nos.	
Email	

We once again thank you for your participation in this survey. Please spare 10 minutes to give your feedback on following pages (Section A to E)

SECTION – A

(Please √ mark in the relevant box and give your remarks / suggestions / information for our improvement).

S. No.	Parameters	1 Do Not Agree	2 Slightly in Agreement	3 In Fair Agreement	4 Mostly in Agreement	5 Fully Agree	Remarks/ Suggestion
1	You receive all relevant queries / tenders from us in timely manner.						
2	We provide you enough lead time to respond to our queries / tenders.						
3	We provide you adequate support (drawings, documents, clarifications, briefing etc.) to enable you meet our requirements.						
4	All following elements of our contract / purchase order are rational :						
4.1	Scope of Work						
4.2	Delivery / Execution Schedule						
4.3	Payment Terms						
4.4	Liquidated Damages						
4.5	Performance Guarantee						
5	Our purchase orders / contracts are simple, specific & easy to understand						
6	TPNODL demonstrate willingness to be flexible in administration of Contract / Purchase Order						
7	We provide timely responses / clarifications to your queries						
8	TPNODL representative you interact / coordinate with is adequately empowered to support you in meeting contractual obligations						
9	TPNODL provide you all necessary infrastructure support for timely and quality completion of work (including AMC)						
10	TPNODL Engineer-in-Charge timely certifies the jobs executed/ material supplied						
11	TPNODL Engineer-in-Charge efficiently supervises the job execution for timely completion of job						
12	BIRD (Bill Inward Receipt Desk) initiative has improved payment disbursement process						

S. No.	Parameters	1 Do Not Agree	2 Slightly in Agreement	3 In Fair Agreement	4 Mostly in Agreement	5 Fully Agree	Remarks/ Suggestion
13	Our approach for Inspection and Quality Assurance effective to expedite project completion?						
14	TPNODL never defaults on contractual terms						
15	In TPNODL Contracts closure is done within set time limit						
16	Our material receiving procedures are well defined and efficiently deployed to reduce mutual inconvenience						
17	Bank Guarantees are released in time bound manner						
18	Our processes related to payment / account settlement are effective.						
19	You get payments on time						
20	TPNODL Employees follow Ethical behaviour						

SECTION – B

SECTION – B (Please rate the following parameters on a scale of 1 to 5, where 1 - Minimum; 5 - Maximum)

S. No.	Parameters	1	2	3	4	5	Remarks/ Suggestion
1	How do you rate courtesy/ empathy/ attitude level and warmth of TPNODL employees you interact with from following team?						
1.1	Project Engineering						
1.2	District / Zones						
1.3	Projects/HOG (TS &P)						
1.4	Inspection & Quality Assurance						
1.5	Stores						
1.6	Metering & Billing						
1.7	Accounts / Finance						
1.8	Administration						
1.9	IT & Automation						
2	How would you rate TPNODL in comparison to your other clients in terms of **fairness of treatment and transparency** with its Business Associates?						
3	How would you rate TPNODL in comparison to your other clients in terms of **processes and systems to manage partnership** with its Business Associates						
4	How would you rate TPNODL in comparison to your other clients in terms of **building long term & mutually relations**hip with its Business Associates						

SECTION – C

Please √ mark in the relevant box and give your remarks / suggestions / information for our improvement.

S. No.	Parameters	Certainly No	Probably No	Certainly Yes	Probably Yes	Remarks/ Suggestion
1	Based on your experience with TPNODL, would you like to continue your relationship with TPNODL?					
2	If someone asks you about TPNODL, would you talk “positively” about					

	TPNODL?					
3	Would you refer TPNODL name to others in your community, fraternity and society as a professional & dynamic organization?					

SECTION - D

If we ask you to rate us on a scale of 1 to 10, how will you rate TPNODL, that truly represents your overall satisfaction with us (please tick appropriate box) -

1	2	3	4	5	6	7	8	9	10

SECTION – E

Please √ mark in the relevant box and give your remarks / suggestions / information for our improvement.

Please spare your thoughts for TPNODL's improvement in particular areas of weaknesses, particularly relating to some great practices, attitudes that you have seen elsewhere in Indian and International Organizations, which you recommend TPNODL to adopt. Please give your valuable salient recommendations.

Please spare your thoughts for TPNODL's improvement in particular areas of major concerns for you. We also welcome your suggestions to adopt any best practices, altitudes that you

Recommendation	*Please tick (√) your top 5 expectations out of the following 10 points listed below -*	
(Please list down improvement you expect from TPNODL)	*Timely payment*	
1	*Flexibility in Contracts/PO*	
	Clarity in PO,s & Contracts	
2	*Timely response to quarries*	
	Timely certification of works executed	
3	*Clarity in Specs, drawings, other docs etc.*	
	Adequate information provided on website for tender notification, parties qualified etc.	
4	*Timely receipt of material at site for execution*	
	Performance Guarantee/EMD released in time	

5	*Inspection & quality assurance support for timely job completion*	

We thank you for your time and courtesy!!

ANNEXURE-F

ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

(To be signed and stamped by the bidder prior to participation in the auction event)

In a bid to make our entire procurement process more fair and transparent, TPNODL intends to use the reverse auctions through ARIBA tool as an integral part of the entire tendering process. All the bidders who are found as technically qualified based on the tender requirements shall be eligible to participate in the reverse auction event.

The following terms and conditions are deemed as accepted by the bidder on participation in the bid event:

1. TPNODL shall provide the user id and password to the authorized representative of the bidder. (Authorization Letter in lieu of the same shall be submitted along with the signed and stamped Acceptance Form).
2. TPNODL will make every effort to make the bid process transparent. However, the award decision by TPNODL would be final and binding on the supplier.
3. The bidder agrees to non-disclosure of trade information regarding the purchase, identity of TPNODL, bid process, bid technology, bid documentation and bid details.
4. The bidder is advised to understand the auto bid process to safeguard themselves against any possibility of non-participation in the auction event.
5. In case of bidding through Internet medium, bidders are further advised to ensure availability of the entire infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitch, internet response issues, software or hardware hangs, power failure or any other reason shall not be the responsibility of TPNODL.
6. In case of intranet medium, TPNODL shall provide the infrastructure to bidders. Further, TPNODL has sole discretion to extend or restart the auction event in case of any glitches in infrastructure observed which has restricted the bidders to submit the bids to ensure fair & transparent competitive bidding. In case an auction event is restarted, the best bid as already available in the system shall become the start price for the new auction.
7. In case the bidder fails to participate in the auction event due any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid as submitted by the bidder as a part of the tender shall be considered as the bidder's final no regret offer. Any offline price bids received from a bidder in lieu of non-participation in the auction event shall be out rightly rejected by TPNODL.
8. The bidder shall be prepared with competitive price quotes on the day of the bidding event.
9. The prices as quoted by the bidder during the auction event shall be inclusive of all the applicable taxes, duties and levies and shall be FOR at TPNODL site.
10. The prices submitted by a bidder during the auction event shall be binding on the bidder.
11. No requests for time extension of the auction event shall be considered by TPNODL.
12. The original price bids of the bidders shall be reduced on pro-rata basis against each line item based on the final all inclusive prices offered during conclusion of the auction event for arriving at Contract amount.

Signature & Seal of the Bidder

ANNEXURE-G

To,

DGM (Finance)
TPNODL
Balasore

Sub: **e-Payments through National Electronic Fund Transfer (NEFT) OR Real Time Gross Settlement System (RTGS)**

Dear Sir,

We request and authorize you to affect e-payment through NEFT/RTGS to our Bank Account as per the details given below:-

Vendor Code :

Title of Account in the Bank :

Account Type :

(Please mention here whether account is Savings/Current/Cash Credit)

Bank Account Number : | | | | | | | | | | | | | | | | | |

Name & Address of Bank :

Bank Contact Person's Names :

Bank Tele Numbers with STD Code :

Bank Branch MICR Code : | | | | | | | | | | | | |

(Please enclose a Xerox a copy of a cheque. This cheque should not be a payable at par cheque)

Bank Branch IFSC Code : | | | | | | | | | | | | | |

(You can obtain this from branch where you have your account)

Email Address of accounts person: : (to send payment information)

Name of the Authorized Signatory: :

Contact Person's Name:

Official Correspondence Address:

We confirm that we will bear the charges, if any, levied by our bank for the credit of NEFT/RTGS amounts in our account. Any change in above furnished information shall be informed to TPNODL well in time at our own. Further, we kept TPNODL indemnified for any loss incurred due to wrong furnishing of above information.

Thanking you,

For _____

(Authorised Signatory)

(Signature with Rubber Stamp)

Certification from Bank:

We confirm that we are enabled for receiving NEFT/RTGS credits and we further confirm that the account number (specify Bank a/c no.) of (Please mention here name of the account holder), the signature of the authorised signatory and the MICR and IFSC Code of our branch mentioned above are correct.

This also is certified that the above information is correct as per Bank record

(Manager's/ Officers Signature under Bank Stamp)

ANNEXURE-H

VENDOR APPRAISAL FORM

TO BE SUBMITTED BY VENDOR (To be filled as applicable)			
Part A			
1.0	DETAILS OF THE FIRM		
	1.1	NAME (IN CAPITAL LETTERS)	
	1.2	TYPE OF CONCERN (PROPRIETORY) PARTNERSHIP PVT.LTD., PUBLIC LTD. ETC.	
	1.3	YEAR OF ESTABLISHMENT	
	1.4	LOCATION OF OFFICE POSTAL ADRESS	
	1.5	CONTACT DETAIL OF BA's REPRESENTATIVE NAME E-MAIL ID CELL NO.	
	1.6	LOCATION OF MANUFACTURING UNITS	:
		i) UNITS 1	:
		ii) OTHER UNITS	:
2.0	PRODUCTS / SERVICES BEING OFFERED		:
3.0	TURNOVER DURING THE LAST 3 YEARS (TO BE VERIFIED WITH THE LATEST PROFIT & LOSS STATEMENT).		:
4.0	AVALABILITY OF STATUTORY DOCUMENTS I.E. COPY OF PAN CARD		:
5.0	AVALABILITY OF STATUTORY DOCUMENTS I.E. COPY OF GST REGISTRATION		÷
6.0	APPLICABILITY UNDER MSME CERTIFICATION		÷
7.0	BA BELONGS TO AA COMMUNITY (SC/ST)		÷
8.0	DOCUMENTS VERIFYING ADDRESS PROOF (SUPPORTED BY ANY GOVT. ISSUED DOCUMENT)		÷

9.0	TECHNICAL		
	9.1	NO.OF DESIGN ENGINEERS (INDICATE NO.OF YEARS EXPERIENCE IN RELATED FIELDS)	:
	9.2	NO.OF DRAUGHTSMEN	:
	9.3	COLLABORATION DETAILS (IF ANY)	:
		9.3.1 DATE OF COLLABORATION	:
		9.3.2 NAME OF COLLABORATOR	:
		9.3.3 RBI APPROVAL DETAILS	:
		9.3.4 EXPERIENCE LIST OF COLLABORATOR	:
		9.3.5 DURATION OF AGREEMENT	:
	9.4	AVAILABILITY OF STANDAR0DS / DESIGN PROCEDURES / COLLA-BORATOR'S / DOCUMENTS (CHECK WHETHER THESE ARE LATEST/CURRENT	:
	9.5	TECHNICAL SUPPORT, BACK-UP GUARANTEE, SUPERVISION, QUALITY CONTROL BY COLLABORATOR (WHEREVER ESSENTIAL). (THIS CLAUSE IS RELEVANT WHEN VENDOR'S EXPERIENCE IS INADEQUATE)	:
	9.6	QUALITY OF DRAWINGS	:
10.0	MANUFACTURE		
	10.1	SHOP SPACE, LAYOUT LIGHTING, VENTILATION, ETC.	:
	10.2	POWER (KVA)	:
		MAINS INSTALLED	:
		UTILISED	:
		STANDBY POWER SOURCE	:
	10.3	MANUFACTURING FACILITIES (ATTACH LIST OF EQUIPMENTS AS APPLICABLE)	:
		10.3.1 MATERIAL HANDLING	:
		10.3.2 MACHINING	:
		10.3.3 FABRICATION	:

		10.3.4 HEAT TREATMENT	:
		10.3.5 BALANCING FACILITY	:
		10.3.6 SURFACE TREATMENT PRIOR TO PAINTING/ COATING, POLISHING, PICKLING, PASSIVATION, PAINTING, ETC.	:
	10.4	SUPERVISORY STAFF	:
	10.5	ADEQUACY OF SKILLED LABOURS (MACHINISTS, WELDERS, ETC.)	:
	10.6	NO. OF SHIFTS	:
	10.7	TYPE OF MATERIAL HANDLED (SUCH AS CS, SS, ETC.)	
	10.8	WORKMANSHIP	:
	10.9	MATERIAL IN STOCK AND VALUE	:
	10.10	TRANSPORT FACILITIES	:
	10.11	CARE IN HANDLING	:
11.0	INSPECTION / QC / QA / TESTING		
	11.1	NUMBER OF PERSONNEL (INDICATE NO.OF YEARS OF EXPERIENCE)	:
	11.2	INDEPENDENCE FROM PRODUCTION	:
	11.3	AVAILABILITY OF PROCEDURAL WRITE UP/QUALITY PLAN	:
	11.4	INCOMING MATERIAL CONTROL AND DOCUMENTATION	:
	11.5	RELIABILITY/REPUTATION OF SUPPLY SOURCES	:
	11.6	STAGE INSPECTION AND DOCUMENTATION	:
	11.7	SUB-ASSEMBLY & DOCUMENTATION	:
	11.8	FINAL INSPECTION AND DOCUMENTATION	:
	11.9	PREPARATION OF FINAL DOCUMENTATION PACKAGE	:
	11.10	TYPE TEST FACILITIES	:
	11.11	ACCEPTANCE TEST FACILITIES	:

	11.12	CALIBRATION OF INSTRUMENTS AND GAUGES (WITH TRACEABILITY TO NATIONAL STANDARDS) (ATTACH LIST)	:
	11.13	STATUTORY APPROVALS LIKE BIS, IBR, ETC.(AS APPLICABLE)	:
	11.14	SUB-VENDOR APPROVAL SYSTEM AND QUALITY CONTROL	:
	11.15	DETAILS OF TESTS CARRIED OUT AT INDEPENDENT RECOGNISED LABORATORIES	:
		i) FURNISH LIST OF TESTS CARRIED OUT AND THE NAME OF THE LABORATORY WHERE THE TESTS WERE CONDUCTED	:
		ii) CHECK AVAILABILITY OF CERTIFICATES AND REVIEW THESE WHEREVER POSSIBLE	:
12.0	EXPERIENCE (INCLUDING CONSTRUCTION / ERECTION / COMMISSIONING) TO BE FURNISHED IN THE FORMAT INDICATED IN APPENDIX)		:
13.0	SALES, SERVICE AND SITE ORGANISATIONAL DETAILS		:
14.0	CERTIFICATE FROM CUSTOMERS (ATTACH COPIES OF DOCUMENTS)		:
15.0	POWER SITUATION		:
16.0	LABOUR SITUATION		:
17.0	APPLICABILITY OF SC/ST RELAXATION (Y/N) IF YES, SUPPORTING DOCUMENTS TO BE ATTACHED		
Part C Supporting Documents			

18.0	**DOCUMENTS TO BE ENCLOSED:** 1. Factory License 2. ISO Certificate 3. Registration of Central Excise 4. Income Tax Clearance. 5. PF Registration 6. ESI Registration 7. Insurance for Workman Compensation Act No. 8. Electrical Contract LIC No. 9. PAN No. 10. GST Registration 11. MSME Certification 12. WC Tax Registration 13. Organogram of Co. having organogram of Design, safety, quality, production and other teams. 14. Details of subscription of BIS, IEC, IEE, ASTM or other. 15. Details of the team in Design, Quality, Safety, Production. 16. List of manufacturing equipment as per Part C. 17. List of calibrated equipment as per Part C. 18. List of clients and order executed in past two years. 19. Complaint escalation matrix. 20. Performance Certificates of same product from Minimum two utilities. 21. e-Payment Form as per enclosed Annexure-G	

*** Classification of BA s under SC/ST shall be governed under following guidelines:**

- **Proprietorship/ Single Ownership Firm:** Proprietor of the firm should be from SC/ST community. Governing document shall be Proprietorship Deed.
- **Partnership Firm:** Only such firms shall qualify which have SC/ST partners holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Partnership Deed.
- **Private Limited Company:** Only such firms shall qualify which have SC/ST directors holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Memorandum of Understanding (MoU) and/or Article of Association (AoA).
- The relaxation available for BAs under SC / STs shall be as per GCC for Tender Fees, EMD, PBG and Turnover criteria.

NOTE: Certification from SC/ST Commission shall be required for deciding upon SC/ST status of a person.

Annexure-G (e-Payment detail form) must be filled by Associate along with this form.

ANNEXURE-I

MANUFACTURER AUTHORIZATION FORM

(To be submitted on OEM's Letter Head)

Date: …….

Tender Enquiry No.: ……..

To,

Chief (Contracts & MM)

TPNODL,
Balasore

Sir,

WHEREAS M/s. *[name of OEM]*, who are official manufacturers of …… having factories at *[address of OEM]* do hereby authorize M/s *[name of bidder]* to submit a Bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the following Goods, manufactured by us

……and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with the Special Conditions of Contract or as mentioned elsewhere in the Tender Document, with respect to the Goods offered by the above firm in reply to this Invitation for Bids.

We hereby confirm that in case, the channel partner fails to provide the necessary services as per the Tender Document referred above, M/s *[name of OEM]* shall provide standard warranty on the materials supplied against the contract. The warranty period and inclusion / exclusion of parts in the warranty shall remain same as defined in the contract issued to their channel partner against this tender enquiry.

Yours Sincerely,

For ……..

Authorized Signatory

Annexure-J

TATA CODE OF CONDUCT (TCoC)

Introducing Tata Code of Conduct (TCoC) in GCC, the following clause is proposed for inclusion as per suggestions from Chief Ethics Counsellor -

"TCoC is the overarching policy framework that applies to all TATA Group companies including TPNODL. TCoC provides for stakeholder-wise approach in each of the seven chapters.

The chapter "Our Value Chain Partners" states the policy as follows:

1. We shall select our suppliers and service providers fairly and transparently.
2. We seek to work with suppliers and service providers who can demonstrate that they share similar values. We expect them to adopt ethical standards comparable to our own.
3. Our suppliers and service providers shall represent our company only with duly authorized written permission from our company. They are expected to abide by the Code in their interactions with, and on behalf of us, including respecting the confidentiality of information shared with them.
4. We shall ensure that any gifts or hospitality received from, or given to, our suppliers or service providers comply with our company's gifts and hospitality policy.
5. We respect our obligations on the use of third party intellectual property and data.

In case any Ethical Concern is faced during the course of your business dealings BA can write to Chief- Contracts & MM and CEO.

TPNODL is committed to follow Core Values and Core Principles mentioned in TCoC, cited below, in carrying out various activities as well as in discharge of bi-lateral and multi-lateral obligations involving other entities/organizations:

Core Values:

All six core values are already mentioned in GCC.

Core Principles:

1. **Zero tolerance to bribery or corruption** in any form.
2. Committed to **good corporate citizenship**
3. Contribute to the **economic development of the communities** of the countries & regions we operate in.
4. No compromise on **Safety**
5. Our conduct shall be **fair & transparent**
6. Respect the **human rights & dignity** of our stakeholders
7. **No unfair discrimination** of any kind
8. Statements made to stakeholders shall be **truthful** & made in **good faith**
9. Not engage in any restrictive or **unfair trade practice**
10. Provide avenues for our stakeholders to **raise concerns in good faith**
11. Environment **free from fear** of retribution to deal with concerns that are raised
12. Expect the leaders to be **role model**

13. **Comply with the laws** of the countries in which we operate

Gift Policy:

Principles for acceptance of gifts/benefits –

A gift or benefit may be accepted only if it complies with all of the following principles:

- ✓ it does not influence,
- ✓ does not have the potential to influence, an employee in such a way as to compromise or appear to compromise integrity and impartiality
- ✓ does not create a conflict of interest or perception of conflict of interest;

Principles for non-acceptance of gifts/benefits -

The gift or benefit may not be accepted or given if any of the following principles apply:

- ✓ causes the recipient or donor **to act in partial manner** in the course of duty
- ✓ apprehension of the recipient becoming **obligated to the donor**
- ✓ it is **not offered openly**
- ✓ if is an **offer of money** or something readily convertible to money (e.g. Shares)

Violation –

1. Not abiding with this policy would constitute violation of “Our Employees” Stakeholder group Clause “Gifts and Hospitality” of the Tata Code of Conduct (TCoC) 2015. Prompt action will be taken against violations.
2. Any deviation from this policy must be supported by appropriate rationale and must be duly approved by CEO who is also the Principal Ethics Officer. In any case, in dealing with such deviations, the spirit of the TCoC should in no case be compromised.

2. If it is determined that an employee / associate has violated this policy, appropriate action including termination of the employee’s / associate’s employment or association with TPNODL may be decided upon.

CONTENTS

1. SCOPE

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading at store/ site of 33 KV Pin polymer insulator 10 KN used in 33 KV Overhead Transmission lines.

2. APPLICABLE STANDARDS:

Insulator shall comply with the requirements stated in the latest editions of the following standards

- IEC: 61109: Definition, test methods and acceptance criteria for compositeinsulators for A.C. overhead lines above 1000V.
- IEC: 61952: Insulators for overhead lines - Composite line post insulators for alternative current.
- IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing.
- IS: 2486/ IEC: 60120: Specification for Insulator fittings for Overhead Power Lineswith a nominal voltage greater than 1000V General Requirements and Tests, Dimensional Requirements Locking Devices.
- IEC: 60575: Thermal Mechanical Performance test and mechanical performancetest on string insulator units.
- IS: 13134/ IEC: 60815: Guide for the selection of insulators in respect of pollutedcondition.
- STRI guide 1.92/1: Hydrophobicity Classification Guide.
- IEC: 60437: Methods of RI Test of HV insulators.
- IS: 4759: Hot dip zinc coatings on structural steel & other allied products.
- IS: 2629: Recommended Practice for Hot, Dip Galvanization for iron and steel.
- IS: 6745: Determination of Weight of Zinc Coating on Zinc coated iron and steelarticles.
- IS: 2633: Testing of Uniformity of Coating of zinc coated articles.
- ASTM D 578-05: Standard specification for glass fiber strands.

3. CLIMATIC CONDITIONS:

a)	Maximum Ambient Temperature	50 ^{o}C
b)	Maximum Daily Average Ambient Temperature	40 ^{o}C
c)	Minimum Ambient Temperature	2 ^{o}C
d)	Maximum Humidity	99.7 %
e)	Minimum Humidity	15 %

f)	Average rainy days per annum	160 days
g)	Average number of thunderstorm days per annum	70
h)	Wind velocity	200 km/hr
i)	Average Annual Rainfall	1800 mm

Note: The atmosphere across coastal divisions of TPNODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3g.

4. GENERAL TECHNICAL REQUIREMENTS

Sl. No.	Description	Unit	Requirements
1.	Type of Insulator		Polymeric Pin Insulator
2.	Standard according to which the Insulators are manufactured and tested.		IEC 61952 & IEC 61109
3.	Material of Housing and Weather Sheds		High voltage grade rubber
a.	Material of Core (FRP Rod)		ECR BORON FREE
b.	Material of end fittings		SGI Cast/Forged steel
c.	Sealing compound for end fittings		Silicone Sealant
4.	Colour of housing		Grey
5.	**ELECTRICAL CHARACTERISTICS**		
a)	Nominal system voltage	kV	33
b)	Highest system voltage	kV	36
c)	Dry Power frequency withstandvoltage	kV	95
d)	Wet Power frequency withstandvoltage	kV	75
e)	Dry Power Frequency Flashover Voltage	kV	130
f)	Wet Power Frequency Flashover voltage	kV	90
g)	Dry Lightening Impulse withstand Voltage	kV	Positive: 170 KV Negative: 180 KV
h)	Dry Lightening Impulse FlashoverVoltage	kV	Positive: 210 KV Negative: 230 KV
i)	RIV at 1 MHz when energized at 10 KV/ 30 KV (rms.) under dry condition	microvolt	< 70
j)	Dry arc distance	Mm	300
k)	Visible Discharge Test Voltage	kV (rms.)	27
6.	**OTHER PHYSICAL & DIMENSIONAL REQUIREMENTS:**		
a)	Creepage distance (Min.)	Mm	900
b)	Minimum Failing Load	**KN**	10
c)	Dia. of FRP Rod	Mm	24
d)	Length of FRP Rod	Mm	300
e)	Diameter of weather sheds	Mm	110
f)	Thickness of Housing	Mm	3
g)	No. of weather sheds (min.)	Nos.	8
h)	Method of fixing sheds to housing		Injection Moulding
i)	Type of Sheds		Aerodynamic

j)	Dia. of bottom end fitting	Mm	24
k)	Thread Length of bottom end fitting	Mm	130
l)	Type of Packing		Wooden / Corrugated Box
m)	No. of Insulators in each box	Nos.	20

5. GENRERAL CONSTRUCTION

Polymeric Insulators shall be designed to meet the high quality, safety and reliability and are capable of withstanding a wide range of environmental conditions.

Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:-

a. Core – the internal insulating part
b. Housing – the external insulating part
c. Weather Sheds
d. Metal End Fittings.

5.1 CORE

It shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP rod). Glass fibers and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fiber and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free. All rods must pass electric leakage current test of 170V/mm. The leakage current shall not exceed 0.05mA.

5.2 POLYMER HOUSING

The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing of thickness 3mm minimum. It shall be one-piece housing using only Injection Molding process to cover the core. Primer should be used to bond the housing with FRP rod. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences. Housing shall conform to the requirements of IEC 60815 with latest amendments. The high voltage grade Silicone rubber polymer material should be as per requirement specified in clause 8.2.2

5.3 WEATHER SHEDS

The composite polymer weather sheds made of high voltage grade Silicone rubber polymer shall be molded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution and humidity. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The interface, if any, between sheds and sheath (housing) shall be free from voids.Housing and weather shed material shall have tensile strength of 3 MPa with 400% elongation minimum and tear strength of 16N/mm. The high voltage grade Silicone rubber polymer material should be as per requirement specified in clause 8.2.2

5.4 METAL END FITTINGS

End fitting transmit the mechanical load to the core. They shall be made of spheroidal graphite cast iron, malleable cast iron or forged steel or aluminum alloy. Metal end fittingshall be suitable for pin type hardware support of respective specified mechanical load and shall be hot dip galvanized in accordance with IS 2629. They shall be connected to the rod by means of a controlled compression technique. The OD of end fittings should be machined to make the surface uniform round to ensure effective sealing when housing is molded over it. The material used in fittings shall be corrosion resistant. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be properly attached to the core by a coaxial or hexagonal compression process & should not damage the individual fibers or crack the core. The dimensions of end fittings of insulators shall be in accordance with the standard dimensions stated in IEC: 60120/ IS: 2486 - Part-II /1989. Outer portion of Pin should be Zinc sleeved with minimum 99.95% purity of Electrolytic high grade zinc. Bottom end metal fitting (Shank) of Pin insulator should be forged steel as per IS 2002/92. Bottom end fitting should be single unit without any joints.

Nuts as per IS 1363 (P-11I) and spring washer shall be as per IS 3063 with Latestamendments if any, Nuts and spring washer shall be hot dip galvanized.

The design of the insulator shall be such that stresses due to expansion and contraction in any part of the insulators shall not lead to deterioration. The Pin insulator shall not engage directly with hard metal.

6. MARKING

Each insulator shall be legibly and indelibly marked as-

a. Name & Trade mark of the manufacturer

b. Month and year of manufacture

c. Minimum failing load in KN

d. "TPNODL" Name should be mentioned on each insulator.

7. TESTS :

TYPE TESTS :

a) Dry lightning impulse withstand voltage test.
b) Dry/Wet power frequency test.
c) Mechanical load-time test.
d) Radio interference test.
e) Recovery of Hydrophobicity test.
f) Brittle fracture resistance test.
g) Cantilever Load withstand test for Pin Insulators.

Tests on the high voltage grade Silicone rubber material used in manufacture of theinsulator housing and weather sheds:

The bidder shall furnish following type test reports conducted on High voltage Silicone rubber material used for Polymer housing confirming following properties along with their bid:

Sl. No.	Property	Requirement	Standard
1.	Tensile Strength (MPa)	4 MPa min	ASTM D 412 – 06 a
2.	Elongation (%)	300 %	ASTM D 412 – 06 a
3.	Tear Strength	15 N / mm min	ASTMD 624
4.	Inclined plane tracking & erosion resistance test	4.5 kV 360 min	ASTM D 2303
5.	Volume Resistivity (Ohm - cm)	1 x 10 ˆ13 ohm – cm min	ASTM D 257
6.	Dielectric constant	4	ASTM D 150
7.	Dielectric constant	26 kV / mm min	ASTM D 149
8.	Density	1.5 min	ASTM D 792
9.	Hardness (shore A)	62 nominal	ASTM D 2240
10.	Arc resistance	>220 seconds	ASTM D 495 – 99
11.	Silicone Content	>40%	BS: 2782 – Pt 10
12.	Flammability	V0	UL 94

ACCEPTANCE TEST :

a) Physical & Dimensional Verification of materials.
b) Mechanical Load Test
c) Galvanizing test.
d) Dry Power Frequency Withstand Voltage Test

ROUTINE TEST :

a) Physical & Dimensional Verification of materials.
b) Mechanical Load Test
c) Identification of Marking

8.TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the 33 KV Pin Polymer Insulators for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA as per

the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPNODL.

9. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment if found unsatisfactory as to workmanship or material is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL's representatives at all times when the work is in progress. Inspection by the TPNODL or its authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL.

Following documents shall be sent along with material

i. Test Reports
ii. MDCC issued by TPNODL
iii. Invoice in duplicate
iv. Packing list
v. Drawings & catalogue
vi. Guarantee/ Warrantee card
vii. Delivery Challan
viii. Other Documents(as applicable)

10.INSPECTION AFTER RECEIPT AT STORE:

TPNODL Inspectors will inspect the material received at TPNODL Store and shall haveright to reject if found different from the reports of the pre-dispatch inspection.

11. GUARANTEE:

Supplier shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be. Supplier shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Company.

12. PACKING AND TRANSPORT:

Supplier shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit.

13. TENDER SAMPLE:

As and when required.

14. QUALITY CONTROL:

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection withinthe parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

15. TESTING FACILITIES:

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out allroutine tests & acceptance tests as per relevant International/ Indian standards.

16. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNOL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) Experience List
d} Type test certificates.

Drawings / documents to be submitted after the award of the contract are as under:

Sl. No.	Description	For Approval	For Review Information	Final Submission
1.	Technical Parameters	✓		✓
2.	General Arrangement Drawing	✓		✓
3.	Mounting and fixing arrangement		✓	✓
4.	Instruction for use		✓	✓
5.	QA & QC Plan & Type Test certificates	✓	✓	✓

17. GUARANTEED TECHNICAL PARTICULARS

Bidder shall submit guaranteed technical particulars in the attached format:

Sl.no	Description	Unit	Requirements	
1.	Type of Insulator		Polymeric Pin Insulator	To be furnished by Bidder
2.	Standard according to which the Insulators are manufactured and tested.		IEC 61952 & IEC 61109	
3.	Material of Housing and Weather Sheds		High voltage grade rubber	
a.	Material of Core (FRP Rod)		ECR BORON FREE	
b.	Material of end fittings		SGI Cast/Forged steel	
c.	Sealing compound for end fittings		Silicone Sealant	
4.	Colour of housing		Grey	
5.	**ELECTRICAL CHARACTERISTICS**			
a.	Nominal system voltage	kV	33	
b.	Highest system voltage	kV	36	
c.	Dry Power frequency withstandvoltage	kV	95	
d.	Wet Power frequency withstandvoltage	kV	75	
e.	Dry Power Frequency Flashover Voltage	kV	130	
f.	Wet Power Frequency Flashover voltage	kV	90	
g.	Dry Lightening Impulse withstand Voltage	kV	Positive: 170 KV Negative: 180 KV	
h.	Dry Lightening Impulse FlashoverVoltage	kV	Positive: 210 KV Negative: 230 KV	
i.	RIV at 1 MHz when energized at 10 KV/ 30 KV (rms.) under dry condition	microvolt	< 70	
j.	Dry arc distance	mm	300	
k.	Visible Discharge Test Voltage	kV (rms.)	27	
6.	**OTHER PHYSICAL & DIMENSIONAL REQUIREMENTS:**			
a.	Creepage distance (Min.)	mm	900	

b.	Minimum Failing Load	KN	10	
c.	Dia. of FRP Rod	mm	24	
d.	Length of FRP Rod	mm	300	
e.	Diameter of weather sheds	mm	110	
f.	Thickness of Housing	mm	3	
g.	No. of weather sheds (min.)	Nos.	8	
h.	Method of fixing sheds to housing		Injection Moulding	
i.	Type of Sheds		Aerodynamic	
j.	Dia. of bottom end fitting	mm	24	
k.	Thread Length of bottom end fitting	mm	130	
l.	Type of Packing		Wooden / Corrugated Box	
m.	No. of Insulators in each box	Nos.	20	

18. SCHEDULE OF DEVIATIONS

The Bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the bidder shall be deemed to confirm the purchaser's specifications. (Format is attached)

(TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the Purchaser's specifications:

Sl. No.	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those mentioned above.

Seal of the Company Designation

Signature

CONTENTS

1. SCOPE

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading at store/ site of 33 KV polymer post insulator 10 KN.

2. APPLICABLE STANDARDS:

Insulator shall comply with the requirements stated in the latest editions of the following standards

- IEC: 61109: Definition, test methods and acceptance criteria for compositeinsulators for A.C. overhead lines above 1000V.
- IEC: 61952: Insulators for overhead lines - Composite line post insulators for alternative current.
- IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing.
- IS: 2486/ IEC: 60120: Specification for Insulator fittings for Overhead Power Lineswith a nominal voltage greater than 1000V General Requirements and Tests, Dimensional Requirements Locking Devices.
- IEC: 60575: Thermal Mechanical Performance test and mechanical performancetest on string insulator units.
- IS: 13134/ IEC: 60815: Guide for the selection of insulators in respect of pollutedcondition.
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- IEC: 60437: Methods of RI Test of HV insulators.
- IS: 4759: Hot dip zinc coatings on structural steel & other allied products.
- IS: 2629: Recommended Practice for Hot, Dip Galvanization for iron and steel.
- IS: 6745: Determination of Weight of Zinc Coating on Zinc coated iron and steelarticles.
- IS: 2633: Testing of Uniformity of Coating of zinc coated articles.
- ASTM D 578-05: Standard specification for glass fiber strands.

3. CLIMATIC CONDITIONS:

a)	Maximum Ambient Temperature	50 ^{o}C
b)	Maximum Daily Average Ambient Temperature	40 ^{o}C
c)	Minimum Ambient Temperature	2 ^{o}C
d)	Maximum Humidity	99.7 %
e)	Minimum Humidity	15 %

f)	Average rainy days per annum	160 days
g)	Average number of thunderstorm days per annum	70
h)	Wind velocity	200 km/hr
i)	Average Annual Rainfall	1800 mm

Note: The atmosphere across coastal divisions of TPNODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3g.

4. GENERAL TECHNICAL REQUIREMENTS

Sl. No.	Description	Unit	Requirements
1.	Type of Insulator		Polymeric Post Insulator
2.	Standard according to which the Insulators are manufactured and tested.		IEC 61109 with latest amendment
3.	Method of manufacturing		Injection Moulding
4.	Material of Housing and Weather Sheds (Silicon content by weight)		Silicone Rubber & Silicon Content by weight 30% Min.
a.	Material of Core (FRP Rod)		ECR BORON FREE
b.	Material of end fittings		SGI
c.	Sealing compound for end fittings		RTV Silicone
5.	Colour of housing		Grey
6.	**ELECTRICAL CHARACTERISTICS**		
a)	Nominal system voltage	kV	33
b)	Highest system voltage	kV	36
c)	Dry Power frequency withstandvoltage	kV	125
d)	Wet Power frequency withstandvoltage	kV	88
e)	Dry Power Frequency Flashover Voltage	kV	135
f)	Wet Power Frequency Flashover voltage	kV	96
g)	Dry Lightening Impulse withstand Voltage	kV	Positive: 220 KV Negative: 240 KV
h)	Dry Lightening Impulse FlashoverVoltage	kV	Positive: 250 KV Negative: 260 KV
i)	RIV at 1 MHz when energized at 10 KV/ 30 KV (rms.) under dry condition	microvolt	< 100
7.	**OTHER PHYSICAL & DIMENSIONAL REQUIREMENTS:**		
a)	Creepage distance (Min.)	Mm	1300
b)	Minimum Failing Load	**KN**	10
c)	Dia. of FRP Rod	Mm	33.5
d)	Length of FRP Rod	Mm	440
e)	Diameter of weather sheds	Mm	145
f)	Thickness of Housing	Mm	3
g)	No. of weather sheds (min.)	Nos.	8
h)	Method of fixing sheds to housing		Injection Moulding
i)	Type of Sheds		Aerodynamic

j)	Type of Packing		Wooden / Corrugated Box

5. GENRERAL CONSTRUCTION

Polymeric Insulators shall be designed to meet the high quality, safety and reliability and are capable of withstanding a wide range of environmental conditions.

Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:-

a. Core – the internal insulating part

b. Housing – the external insulating part

c. Weather Sheds

d. Metal End Fittings.

5.1 CORE

It shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP rod). Glass fibers and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fiber and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free. All rods must pass electric leakage current test of 170V/mm. The leakage current shall not exceed 0.05mA.

5.2 POLYMER HOUSING

The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing of thickness 3mm minimum. It shall be one-piece housing using only Injection Molding process to cover the core. Primer should be used to bond the housing with FRP rod. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences. Housing shall conform to the requirements of IEC 60815 with latest amendments. The high voltage grade Silicone rubber polymer material should be as per requirement specified in clause 8.2.2

5.3 WEATHER SHEDS

The composite polymer weather sheds made of high voltage grade Silicone rubber polymer shall be molded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution and humidity. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The interface, if any, between sheds and sheath (housing) shall be free from voids.Housing and weather shed material shall have tensile strength of 3 MPa with 400% elongation minimum and tear strength of 16N/mm. The high voltage grade Silicone rubber polymer material should be as per requirement specified in clause 8.2.2

5.4 METAL END FITTINGS

End fitting transmit the mechanical load to the core. They shall be made of spheroidal graphite cast iron, malleable cast iron or forged steel or aluminum alloy. Metal end fittingshall be suitable for post type hardware support of respective specified mechanical load and shall be hot dip galvanized in

accordance with IS 2629. They shall be connected to the rod by means of a controlled compression technique. The OD of end fittings should be machined to make the surface uniform round to ensure effective sealing when housing is molded over it. The material used in fittings shall be corrosion resistant. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be properly attached to the core by a coaxial or hexagonal compression process & should not damage the individual fibers or crack the core. The dimensions of end fittings of insulators shall be in accordance with the standard dimensions stated in IEC: 60120/ IS: 2486 - Part-II /1989. Outer portion of Pin should be Zinc sleeved with minimum 99.95% purity of Electrolytic high grade zinc. Bottom end metal fitting (Shank) of Post insulator should be forged steel as per IS 2002/92. Bottom end fitting should be single unit without any joints.

Nuts as per IS 1363 (P-11I) and spring washer shall be as per IS 3063 with Latestamendments if any, Nuts and spring washer shall be hot dip galvanized.

The design of the insulator shall be such that stresses due to expansion and contraction in any part of the insulators shall not lead to deterioration. The Post insulator shall not engage directly with hard metal.

6. MARKING

Each insulator shall be legibly and indelibly marked as-

a. Name & Trade mark of the manufacturer

b. Month and year of manufacture

c. Minimum failing load in KN

d. "TPNODL" Name should be mentioned on each insulator.

7. TESTS :

TYPE TESTS :

a) Dry lightning impulse withstand voltage test.
b) Dry/Wet power frequency test.
c) Mechanical load-time test.
d) Radio interference test.
e) Recovery of Hydrophobicity test.
f) Brittle fracture resistance test.
g) Cantilever Load withstand test for Post Insulators.

Tests on the high voltage grade Silicone rubber material used in manufacture of theinsulator housing and weather sheds:

The bidder shall furnish following type test reports conducted on High voltage Silicone rubber material used for Polymer housing confirming following properties along with their bid:

Sl. No.	Property	Requirement	Standard
1.	Tensile Strength (MPa)	4 MPa min	ASTM D 412 – 06 a
2.	Elongation (%)	300 %	ASTM D 412 – 06 a
3.	Tear Strength	15 N / mm min	ASTMD 624
4.	Inclined plane tracking & erosion resistance test	4.5 kV 360 min	ASTM D 2303
5.	Volume Resistivity (Ohm - cm)	1 x 10 ˆ13 ohm – cm min	ASTM D 257
6.	Dielectric constant	4	ASTM D 150
7.	Dielectric constant	26 kV / mm min	ASTM D 149
8.	Density	1.5 min	ASTM D 792
9.	Hardness (shore A)	62 nominal	ASTM D 2240
10.	Arc resistance	>220 seconds	ASTM D 495 – 99
11.	Silicone Content	>40%	BS: 2782 – Pt 10
12.	Flammability	V0	UL 94

ACCEPTANCE TEST :

a) Physical & Dimensional Verification of materials.
b) Mechanical Load Test
c) Galvanizing test.
d) Dry Power Frequency Withstand Voltage Test
e) Temperature cycle Test
f) Porosity Test

ROUTINE TEST :

a) Physical & Dimensional Verification of materials.
b) Mechanical Load Test
c) Identification of Marking

8.TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the 33 KV Post Polymer Insulators for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA as per

the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPNODL.

9. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment if found unsatisfactory as to workmanship or material is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL's representatives at all times when the work is in progress. Inspection by the TPNODL or its authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL.

Following documents shall be sent along with material

i. Test Reports
ii. MDCC issued by TPNODL
iii. Invoice in duplicate
iv. Packing list
v. Drawings & catalogue
vi. Guarantee/ Warrantee card
vii. Delivery Challan
viii. Other Documents(as applicable)

10.INSPECTION AFTER RECEIPT AT STORE:

TPNODL Inspectors will inspect the material received at TPNODL Store and shall haveright to reject if found different from the reports of the pre-dispatch inspection.

11. GUARANTEE:

Supplier shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be. Supplier shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Company.

12. PACKING AND TRANSPORT:

Supplier shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit.

13. TENDER SAMPLE:

As and when required.

14. QUALITY CONTROL:

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection withinthe parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

15. TESTING FACILITIES:

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International/ Indian standards.

16. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNOL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) Experience List
d} Type test certificates.
e) Cross-sectional Drawing

Drawings / documents to be submitted after the award of the contract are as under:

Sl. No.	Description	For Approval	For Review Information	Final Submission
1.	Technical Parameters	✓		✓
2.	General Arrangement Drawing	✓		✓
3.	Mounting and fixing arrangement		✓	✓
4.	Instruction for use		✓	✓
5.	QA & QC Plan & Type Test certificates	✓	✓	✓

17. GUARANTEED TECHNICAL PARTICULARS

Bidder shall submit guaranteed technical particulars in the attached format:

Sl.no	Description	Unit	Requirements	
1.	Type of Insulator		Polymeric Post Insulator	To be furnished by Bidder
2.	Standard according to which the Insulators are manufactured and tested.		IEC 61952 & IEC 61109	
3.	Material of Housing and Weather Sheds		Silicone Rubber & Silicon Content by weight 30% Min.	
a.	Material of Core (FRP Rod)		ECR BORON FREE	
b.	Material of end fittings		SGI	
c.	Sealing compound for end fittings		RTV Silicone	
4.	Colour of housing		Grey	
5.	**ELECTRICAL CHARACTERISTICS**			
a.	Nominal system voltage	kV	33	
b.	Highest system voltage	kV	36	
c.	Dry Power frequency withstandvoltage	kV	125	
d.	Wet Power frequency withstandvoltage	kV	88	
e.	Dry Power Frequency Flashover Voltage	kV	135	
f.	Wet Power Frequency Flashover voltage	kV	96	
g.	Dry Lightening Impulse withstand Voltage	kV	Positive: 220 KV Negative: 240 KV	
h.	Dry Lightening Impulse FlashoverVoltage	kV	Positive: 250 KV Negative: 260 KV	
i.	RIV at 1 MHz when energized at 10 KV/ 30 KV (rms.) under dry condition	microvolt	< 100	
j.	Dry arc distance	mm		
k.	Visible Discharge Test Voltage	kV (rms.)		
6.	**OTHER PHYSICAL & DIMENSIONAL REQUIREMENTS:**			
a.	Creepage distance (Min.)	mm	1300	

b.	Minimum Failing Load	KN	10	
c.	Dia. of FRP Rod	mm	33.5	
d.	Length of FRP Rod	mm	440	
e.	Diameter of weather sheds	mm	145	
f.	Thickness of Housing	mm	3	
g.	No. of weather sheds (min.)	Nos.	8	
h.	Method of fixing sheds to housing		Injection Moulding	
i.	Type of Sheds		Aerodynamic	
j.	Dia. of bottom end fitting	mm		
k.	Thread Length of bottom end fitting	mm		
l.	Type of Packing		Wooden / Corrugated Box	
m.	No. of Insulators in each box	Nos.		

18. SCHEDULE OF DEVIATIONS

The Bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the bidder shall be deemed to confirm the purchaser's specifications. (Format is attached)

(TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the Purchaser's specifications:

Sl. No.	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those mentioned above.

Seal of the Company Designation

Signature

CONTENTS

1. SCOPE

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing, supply of 33 KV polymer disc insulators T&C type.

2. APPLICABLE STANDARDS:

Insulator shall comply with the requirements stated in the latest editions of the following standards

- IEC: 61109: Definite ion, test methods and acceptance criteria for composite insulators for A.C. overhead lines above 1000V.
- IEC: 61952: Insulators for overhead lines – Composite line post insulators for alternative current.
- IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing.
- IS: 2486/ IEC: 60120: Specification for Insulator fittings for Overhead power Lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements Locking Devices.
- IEC: 60575: Thermal Mechanical Performance test and mechanical performance test on string insulator units.
- IS: 13134/ IEC: 60815: Guide for the selection of insulators in respect of polluted condition.
- STRI guide 1.92/1: Hydrophobicity Classification Guide.
- IEC: 60437: Methods of RI Test of HV insulators.
- IS: 4759: Hot dip zinc coatings on structural steel & other allied products.
- IS: 2629: Recommended Practice for Hot, Dip Galvanization for iron and steel.
- IS: 6745: Determinate ion of Weight of Zinc Coating on Zinc coated iron and steel articles.
- IS: 2633: Testing of Uniformity of Coating of zinc coated articles.
- ASTM D 578-05: Standard specification for glass fiber strands

3. CLIMATIC CONDITIONS:

The material shall be suitable for following climatic conditions,

1. **CLIMATIC CONDITIONS:**		
a)	Maximum Ambient Temperature	50 ^{o}C
b)	Maximum Daily Average Ambient Temperature	40 ^{o}C
c)	Minimum Ambient Temperature	2 ^{o}C
d)	Maximum Humidity	99.7 %
e)	Minimum Humidity	15 %
f)	Average Annual Rainfall	1800 mm
g)	Average Wind Speed prevailing in the area	200 km/hr.

h)	Average Thunderstorms prevailing in the area	70 days per annum
i)	Average dust storms prevailing in the area	20 days per annum
j)	Average number of rainy days per annum	160
k)	Maximum Altitude above sea level	1200 m
l)	Seismic Level	0.24g to 0.48g

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3 g.

4. General Technical Requirements:

GUARANTEED TECHNICAL PERTICULARS 33KV 70KN COMPOSITE POLYMER DISC INSULATOR (T&C)			
Sr	**Descrption**	**TPNODL Requirement**	**Bidder Offer**
1	Type of insulator	33kV 70KN Polymer DiscInsulator (T&C) Type	
2	Reference Standard	IEC 61109	
3	Material of FRP Rod	Boron free ECR	
4	Material of sheds	Silicon Rubber , Silicone contenst > 30%	
5	Type of metal end fittings	Tongue & Clevis (T&C)	
6	Material of end fittings (B&S)	SGCI / MCI, Hot Dip Galvanized	
7	Cotter Pin	SGCI / MCI, Hot Dip Galvanized	
8	Lock Pin	SGCI/ MCI	
9	Material of sealing compound	RTV Silicon	
10	Colour of sheds	Grey	
11	Rated voltage	33KV	
12	Highest voltage	36KV	
13	Frequency	50 Hz	
14	Dry Power Frequency Withstand voltage	95KV	
15	Wet Power Frequency Withstand voltage	70KV	
16	Dry PF Flashover Voltage	110KV	
17	Wet PF Flashover Voltage	80KV	
18	Dry Lightning Impulse withstand voltage Positive	Positive:170 KV	

	Negative	Negative:180 KV	
19	Dry Lightning Impulse Flashover voltage		
	Positive	Positive:210 KV	
	Negative	Negative:230 KV	
20	Visible Discharge Voltage (PF)	27 kV	
21	RIV at 1MHz when energized at 30KV (rms) under dry condition	< 70 microvolt	
22	Creepage distance(min)	900 mm	
23	Minimum Failing load (Tension Load)	70 KN	
24	Dia of FRP Rod (min)	16 mm	
25	Length of FRP Rod (min)	425 mm	
26	Dia of weather sheds (min)	100 mm	
27	Sectional Length	525±20 mm	
28	Thickness of housing (min)	3 mm	
29	Dry arc distance (min)	400 mm	
30	Method of fixing sheds to housing	Injection Moulding	
31	No of weather sheds (min)	8	
32	Type of sheds	Aerodynamic	
33	Shed Profile	Parallel	
34	Weight of composite insulator (min)	1.300 kg	
35	Type of packing	Corrugated Box /HDPE Bag	
36	No of insulator in each pack (Max)	15 Nos.	
37	Gross weight of package (max)	20 kgs.	
38	Marking on insulator	Trade Mark or Mfg name : …… , Tension Load: 70 KN Voltage Rating: 33kV , Mfg Date: MM/YY, Customer Name: TPNODL	
39	Drawing	Enclosed	

5. GENRERAL CONSTRUCTION

Polymeric Insulators shall be designed to meet the high quality, safety and reliability and are capable of withstanding a wide range of environmental conditions.

Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:-

- Core- the internal insulating part
- Housing the external insulating part
- Weather Sheds

- Metal end fittings.

CORE:

It shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP nrod). Glass fibers andresin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosionresistant (ECR) glass fiber and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall bemanufactured through Pultrusion process. The FRP rod shall be void free

POLYMER HOUSING

The FRP rod shall be covered by a seamless sheath of a high voltage grade silicone rubber compound of a thickness of 3 mm minimum. It shall be one-piece housing using injection Molding Principle to cover the core. The elastomer housing shall be designed to provide the necessary creepage distance and protection against environmental influences, external pollution and humidity. Housing shall conform to the requirement of IEC 61109:2008 with latest amendments. It shall be directly molded on core and shall have chemical bonding with the FRP rod. The strength of the bond shall be greater than the tearing strength of the polymer. Sheath material in the bulk as well as in the sealing/bonding area shall be free from voids.

WEATHERSHEDS

The composite polymer Weather sheds made of silicone elastomer compound shall be molded as part of the sheath and shall be free from imperfections. The weather sheds should have silicon rubber content of minimum **30**% by weight. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The interface, if any, between sheds and sheath (housing) shall be free from voids.

METAL END FITTINGS

End fitting transmit the mechanical load to the core. They shall be made of spheroidal graphite cast iron, malleable cast iron or forged steel or aluminum alloy. Metal end fitting shall be suitable for pin type hardware support of respective specified mechanical load and shall be hot dip galvanized in accordance with IS 2629. They shall be connected to the rod by means of a controlled compression technique. The OD of end fittings should be machined to make the surface uniform round to ensure effective sealing when housing is molded over it. The material used in fittings shall be corrosionresistant. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be properly attached to the core by a coaxial or hexagonal compression process &should not damage the individual fibers or crack the core. The dimensions of end fitt ings ofinsulators shall be in accordance with the standard dimensions stated in IEC: 60120/ IS: 2486 - Part-II /1989. Outer portion of Pin should be Zinc sleeved with minimum 99.95% purity of Electrolytic high grade zinc. Bottom end metal fitting (Shank) of Pin insulator should be forged steelas per IS 2002/92. Bottom end fitting should be single unit without any joints.

Nuts as per IS 1363 (P-III) and spring washer shall be as per IS 3063 with Latest amendments if any, Nuts and spring washer shall be hot dip galvanized. The design of the insulator shall be such that stresses due to expansion and contraction in any part of the insulators shall not lead to deterioration. The Pin insulator shall not engage

directly with hard metal.

6. Marking

Each insulator shall be legibly and indelibly marked as

- Name & Trade mark of the manufacturer
- Month and year of manufacture
- Minimum failing load in KN
- "TPNODL" Name should be mentioned on each insulator.

7. TESTS

TYPE TESTS: Insulators offered shall be manufactured with the same configuration & raw materials as used in the Insulators for which design & type test reports are submitted. The manufacturer shall submit a certificate for the same. **The type test reports submitted shall not be more than 07 years old.**

Sr.	Test Description	Test Standard
1	Dry lightning impulse withstand voltage test	IEC 61109 : 2008 & as per customer requirements
2	Dry lightning impulse Flashover voltage test	
3	Wet power frequency withstand voltage test	
4	Wet power frequency flashover voltage test	
5	Dry Power frequency withstand voltage test	
6	Dry Power Frequency Falshover Voltage Test	
7	Radio interference test	IEC 60437
8	VISIBLE DISCHARGE TEST	IS 731/71
9	Recovery of Hydrophobicity test	Annexure-B (As per STRI guide)
10	Polymer (Silicone Resin) content by Thermo Gravimetric Analysis (TGA)	ASTM E1131-08M ERDA Test Procedu INS - 360
11	Water Diffusion test on FRP rod	IEC 62217 : 2012, Cl 9.4.2
12	Brittle fracture resistance test on FRP	REC Spec 76/2006
13	Dye Penetration Test on FRP	IEC 61109 (Cl.10) / IEC 62217
14	Minimum Failing Load Test - Damage limit Proof test and test of the Tighness of interface between end fittings and insulator housing **(Applicable for Disc Insulators only)**	IEC 61109: 2008 Cl. No 11.2
15	Bend Test / Cantiliver failing Load Test **(Applicable for Pin & Post Insulators only)**	As per IS:731 (Clause- 10.8.2)

The bidder shall submit type test reports as per IEC 61109 (with latest amendments, if any) from NABL approved laboratory along with the bid. Additional type tests required if any shall be carried out by the manufacturer, after award of contract for which no additional charges shall be payable. In case, the tests have already been carried out, the manufacturer shall submit reports for the same.

ACCEPTANCE TEST

- Physical & Dimensional Verification of materials
- Mechanical Load Test
- Galvanizing test.
- Dry Power Frequency Withstand Voltage Test

ROUTINE TEST:

- Physical & Dimensional Verification of materials.
- Mechanical Load Test
- Identification of Marking

8. TYPE TEST CERTIFICATE

The bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA as per the relevant standards not exceeding 7 years from the date of opening of the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, the same shall be carried out without any cost implication to TPNODL. TPNODL has rights for Surveillance tests of randomly selected samples from the third-party lab for quality checks of items. TPNODL shall be intimated in case revision is done by the manufacturer in product design/ dimension/ material during the execution of the contract. Subsequently, Type test certificate shall be produced.

9. PRE DISPATCH INSPECTION

Equipment shall be subjected to inspection by a duly authorized representative of TPNODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TPNODL's representatives when the work is in progress. Inspection by TPNODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL.

Following documents shall be sent along with material.

- Test reports
- MDCC issued by TPNODL.
- Invoice in duplicate
- Packing list
- Drawings & catalogue
- Guarantee / Warrantee card
- Delivery Challan
- Other Documents (as applicable)

10. INSPECTION AFTER RECEIPT AT STORES

The material received at TPNODL, Balasore, Odisha store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering and contracts department.

11. GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under this contract for the due and intended performance of the same, as an integrated product delivered under this contract. In the event, any defect is found by the Company up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is later. In the event any defect is found by the Company up to a period of 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract, whichever is earlier, the supplier shall be liable to undertake to replace/rectify such defects at his own costs.

12. PACKING

Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner to protect the equipment from damage in transit.

13. TENDER SAMPLE

Bidder shall submit the sample of material during the tender evaluation process with the offer (in case of first supply to TPNODL).

14. TRAINING

Detailed Installation instruction with drawings for all joints and termination shall be provided by Bidder with tender documents in English and Hindi & Odia Language. Updated installation manual shall be provided in the kit. Hands-on training shall be conducted annually at our site location for BA and TPNODL jointers.
Bidder shall provide installation/operational services at the site.

15. QUALITY CONTROL

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. TPNODL's engineer or its nominated representative shall have free access to the manufacturer's/sub-suppli]er's works to carry out inspections.

16. MINIMUM TESTING FACILITIES

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards

17. MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. DRAWINGS & DOCUMENT

After the award of the contract four (4) copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval.

S. No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	BOM (at the time of pre-bid)	√		
3	Drawing showing Joints Details	√		√
5	Termination drawings	√		
6	Manual/Catalogues		√	√
7	Transport/ Shipping dimension drawing		√	√
8	QA &QC Plan	√	√	√
9	Routine, Acceptance and Type Test Certificates	√	√	√

All the documents & drawings shall be in the English language.

19. SCHEDULE OF DEVIATIONS

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

SCHEDULE OF DEVIATIONS: (TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

S.No	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature:
Date:

1. SCOPE OF WORK:

This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading at store/ site of 11 KV Pin polymer insulator 10 KN used in 11 KV Overhead Transmission lines.

2. APPLICABLE STANDARDS:

Insulator shall comply with the requirements stated in the latest editions ofthe following standards-

a) IEC: 61109: Definition, test methods and acceptance criteria forcomposite insulators for A.C. overhead lines above 1000V.
b) IEC: 61952: Insulators for overhead lines – Composite line postinsulators for alternative current.
c) IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing.
d) IS: 2486/ IEC: 60120: Specification for Insulator fittings for Overheadpower Lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements Locking Devices.
e) IEC: 60575: Thermal Mechanical Performance test and mechanicalperformance test on string insulator units.
f) IS: 13134/ IEC: 60815: Guide for the selection of insulators inrespect of polluted condition.
g) STRI guide 1.92/1: Hydrophobicity Classification Guide.
h) IEC: 60437: Methods of RI Test of HV insulators.
i) IS: 4759: Hot dip zinc coatings on structural steel & other alliedproducts.
j) IS: 2629: Recommended Practice for Hot, Dip Galvanization for ironand steel.
k) IS: 6745: Determination of Weight of Zinc Coating on Zinc coatediron and steel articles.
l) IS: 2633: Testing of Uniformity of Coating of zinc coated articles.
m) ASTM D 578-05: Standard specification for glass fiber strands.

3. CLIMATIC CONDITIONS:

The climatic conditions at site under which the store shall operate satisfactory, are as follows.

i.	Maximum Ambient Temperature	50°c
ii.	Maximum daily average ambient temperature	40°c
iii.	Minimum Ambient Temperature	2°c
iv.	Maximum humidity	99.7%
v.	Minimum humidity	15%
vi.	Average Annual Rainfall	1800mm
vii.	Average wind speed prevailing in the area	200kmph
viii.	Average Thunderstorms prevailing in the area	70 days per annum
ix.	Average Dust storms prevailing in the area	20 days per annum
x.	Average number of rainy days per annum	160
xi.	Maximum Altitude above sea level	1200m
xii.	Rainy months	June to October

Environmentally, some of the regions, where the work will take place includescoastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, thecombination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas.

Therefore, Outdoor material and equipment shall be designed and protectedfor use in exposed, heavily polluted, salty,

corrosive and humid coastal atmosphere

The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

4. GENERAL CONSTRUCTIONS:

Polymeric Insulators shall be designed to meet the high quality, safety and reliability and are capable of withstanding a wide range of environmental conditions. Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:- (a) Core- the internal insulating part (b)Housing- the external insulating part (c)Metal end fittings.

a) CORE:

Core shall be a glass-fibre reinforced epoxy resin rod of high strength (FRP rod). Glass fibres and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fibre and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free.

b) POLYMERIC HOUSING:

The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing. It shall be one- piece housing using only Injection Moulding process to cover the core. Primer should be used to bond the housing with FRP rod. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences. Housing shall confirm to the requirements of IEC 60815 with latest amendments. All surfaces shall be clean, smooth, without cuts, abrasions or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not generate any radio interference beyond specified limit under the operating conditions.

c) WEATHERSHEDS

The composite polymer weather sheds made of high voltage grade Silicone rubber polymer shall be molded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution and humidity. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The interface, if any, between sheds and sheath(housing) shall be free from voids. Housing and weather shed material shall have tensile strength of 3 MPa with 400% elongation minimum and tear strength of 16N/mm

d) METAL END FITTINGS:

End fitting transmit the mechanical load to the core. They shall be made of spheroidal graphite cast iron, malleable cast iron or forged steel or aluminum alloy. Metal end fitting shall be suitable for pin type hardware support of respective specified mechanical load and shall be hot dipgalvanized in accordance with IS 2629. They shall be connected to the rod by means of a controlled compression technique. The OD of end fittings should be machined to make the surface uniform round to ensure effective sealing when housing is molded over it. The material used in fittings shall be corrosion resistant. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be properly attached to the core by a coaxial or hexagonal compression process & should not damage the individual fibers or crack the core. The dimensions of end fittings of insulators shall be in accordance with the standard dimensions stated in IEC: 60120/ IS: 2486 - Part-II /1989.
Outer portion of Pin should be Zinc sleeved with minimum 99.95% purity ofElectrolytic high grade zinc. Bottom end metal fitting (Shank) of Pin insulator should be forged steel as per IS 2002/92. Bottom end fitting should be single unit without any joints. Nuts as per IS 1363 (P-III) and spring washer shall be as per IS 3063 with Latest amendments if any, Nuts and spring washer shall be hot dip galvanized. The design of the insulator shall be such that stresses due to expansion and contraction in any part of the insulators shall not lead to deterioration. The Pin insulator shall not engage directly with hard metal.

5. MARKING:

Each insulator shall be legibly and indelibly marked with "PO no. with date,"Property of TPNODL" along with following:

a. Manufacturer's name
b. Type designation or serial no.
c. Minimum failing load in KN
d. No. of relevant standard
e. Month and year of manufacture
f. Country of manufacture

6. TESTS:

All routine/acceptance tests shall be witnessed by the purchaser/hisauthorized representative. Following tests for 11kV Pin Polymer insulatorshould be done as per relevant standards:

I. Tests on Silicone Rubber:

- Tensile Strength & Elongation
- Tear Strength
- Inclined Plane Tracking & Erosion
- Volume resistivity
- Dielectric Strength
- Dielectric Constant
- Density
- Hardness
- Arc Resistance
- Silicone content
- Flammability
- Resistance to weathering & UV.
- Limiting oxygen index test.
- Specific gravity

II. Tests on FRP Rods:

- Verification of dimensions.
- Specific Gravity
- Glass Content
- Water Diffusion Test
- Hardness
- Dye Penetration Test.
- Flexural strength.
- Water absorption.
- Brittle fracture resistance test.
- Visible discharge test.
- Dry lightning impulse withstand voltage test.
- Wet power frequency withstand voltage test.
- Power Arc test.
- Accelerated weathering test.
- Tracking & erosion test.

III. **Tests on End Fittings**:

- Thickness of Zinc Coating
- Uniformity of Zinc Coating
- Micro-structural of metal fitting.

IV. Test of Complete polymer insulators:

- Dry lightning impulse withstand voltage test.
- Wet power frequency test.
- Mechanical failing load test.
- Radio interference test.
- Mechanical performance test
  U.V Resistance as per ASTM G 53: 1000 Hrs - UV Light for 8 Hours and condensation for 4 hours in a continuous cycle. Elongation to be limited to 20% (% Elongation to break before and after the test).
- Salt Fog test: On insulators for 1000 hours as per IEC.
- Galvanization test.
- Visual examination.
- Verification of dimensions.
- Bending test.
- Verification of the locking system or the tightness of the interfacebetween end fitting and insulator housing.
- Assembled core load time test.
- Determination of the average failing load of the core of theassembled insulator.

V. Design Tests:

For composite insulators it is essential to carry out design test as per clause 4.1 of IEC 61109 / 92-93 with latest amendments. The design testsare intended to verify the suitability of the design, materials and method of manufacture (technology). When a composite insulator is submitted to the design tests, the result shall be considered valid for the whole class ofinsulators, which are represented by the one tested and having the following characteristics:

- The materials for the core, and sheds and same manufacturingmethod;
- The material of the fittings, the same design, the same method ofattachment;
- Polymer insulator should have greater layer thickness of the shedmaterial over the core (including a sheath where used);
- Polymer insulator should have smaller ratio of the highest systemvoltage to insulation length;
- Polymer insulator should have smaller ratio of all mechanical loadsto the smallest core diameter between fittings
- Polymer insulator should have greater diameter of the core.

The tested composite insulators shall be identified by a drawing giving allthe dimensions with the manufacturing tolerances.
Manufacturer should submit test reports for Design Tests as per IEC – 61109 (clause – 5) along with the bid. Additionally following tests shall becarried out or reports for the tests shall be submitted after award of contract: UV test: the test shall be carried out in line with clause 7.2 of ANSI C29.13.
In addition, chemical composition test for silicon content would also beadded in the testing list.

VI. Acceptance Tests

For Composite Insulators

- Verification of dimensions
- Visual examination
- Verification of the locking system or the tightness of the interfacebetween end fitting and insulator housing
- Galvanizing test
- Verification of the specified mechanical load
- Bending load test
- Dry power frequency withstand voltage test
- Analysis of material properties of housing material
- Analysis of material properties of core material

VII. Routine Tests

- Visual Examination
- Mechanical load test as per IEC 61109 & IEC 62231

7. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the 11 KV Pin polymerInsulators for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at **CPRI/ERDA/International Laboratory/NABL** as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPNODL.

8. PRE DISPATCH INSPECTION:

The material shall be subject to inspection by a duly authorized representative of the TPNODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection.

Bidder shall grant free access to the places of manufacture to TPNODL's representatives at all times when the work is in progress. Inspection by the TPNODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL.

Following documents shall be sent along with material

a) Test reports
b) MDCC issued by TPNODL
c) TPNODL Invoice in duplicate
d) Packing list
e) Drawings & catalogue
f) Guarantee / Warrantee card
g) Delivery Challan
h) Other Documents (as applicable).

9. INSPECTION AFTER RECEIPT AT STORES

The material received at TPNODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering & contracts department.

10. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up toa period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own

costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks
And costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses
Incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be.
Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.

11. PACKING:

Bidder shall ensure that all the equipment covered under this specificationshall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.

12. TENDER SAMPLE: As and when required

13. QUALITY CONTROL

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

14. MINIMUM TESTING FACILITIES:

The tenderer must clearly indicate what testing facilities are available in the works of the manufacturer and whether facilities are adequate to carryout all Routine & acceptance Tests. These facilities should be available toTPNODL Engineers if deputed or carry out or witness the tests in the manufacturer works. If any test cannot be carried out at the manufacturer's work, the reasons should be clearly stated in the tender.
The insulators shall be tested in accordance with the procedure detailed inIEC 61109 / 92-93 with latest amendments.

15. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for variousmanufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within15 days from the release of the order.

16. DRAWINGS AND DOCUMENTS:

Following documents shall be prepared based on TPNODL specifications and statutory requirementswith complete BOM and shall be submitted with the bid:

a) Complete Drawing
b) Completely filled in Technical Particulars
c) General description of the equipment and all components including brochures
d) Generalized drawing for Pin Insulator
e) Bill of Material
f) Type test Certificates
g) Experience List.

After the after of the contract, four (4) copies of the drawings, drawn to scale, describing theequipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, test certificatesshall be submitted after the final approval of the same to the purchaser.

Following Drawings/Documents shall be submitted after the award of the contract:

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and testcertificates of the component.		√	√
4	Installation Instructions		√	√
5	Instructions for use		√	√
6	Transport/shipping dimension drawing		√	√
7	QA & QC Plan	√	√	√
8	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language

17. Instruction Manuals:

Bidder shall furnish two (2) soft copies (CD) and four (4) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

18. GUARANTEED TECHNICAL PARTICULAR

SL NO	TECHNICAL PARTICULAR	DESIRED VALUE	BIDDER'S OFFER
1	Type of Insulator	Polymeric Pin Insulator	
2	Standard according to which the insulators manufactured and Tested	IEC 61952 and IEC 61109	
3	Material of FRP Rod	Borron free ECR	
4	Material of sheds	Silicon Rubber	
5	Material of Top End Fittings	SGCI /MCI/FORGED STEEL	
6	Material of Bottom End Fittings Material of sealing compound	FORGED STEEL RTV Silicon RTV Silicon	
7	Colour of sheds	Grey	
8	Rated system voltage	11 KV	
9	Highest system voltage	12 KV	

10	Dry Power Frequency Withstand voltage	60 KV	
11	Wet Power Frequency Withstand voltage	35 KV	
12	Dry Power Frequency Flashover Voltage	75 KV	
13	Wet Power Frequency Flashover Voltage	45 KV	
14	Dry Lightning Impulse withstand voltage	Positive: 75 KV Negative: 80 KV	
15	Dry Lightning Impulse Flashover voltage	Positive: 95 KV Negative: 100 KV	
16	RIV at 1 MHz when energised at 10 KV / 30 KV (rms) under dry condition	< 50 microvolt	
17	Creepage distance (min)	320 mm	
18	Min Failing load	10 KN	
19	Dia of FRP Rod	24 mm	
20	Length of FRP Rod (min)	165 mm	
21	Dry arc distance(min)	150 mm	
22	Thickness of housing	3mm	
23	Method of fixing sheds to housing	Injection moulding	
24	Visible Discharge Voltage (PF)	9KV	
25	Type of sheds	Aerodynamic	
26	Dia of bottom end fitting	20 mm	
27	Thread length of bottom end fitting	110 mm (Min)	
28	Type of packing	Wooden / Corrugated box	

29	No of insulator in each pack	Thirty	
30	Marking / Embossing	TPNODL, Manufacture's name or trademark, Month &Year of Manufacture	

19. SCHEDULE OF DEVIATIONS:

(TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications

Sr No.	Clause No.	Details of deviation with justification,

We confirm that there are no deviations apart from those detailed above.

Seal of the Company: Signature

Designation

CONTENTS

1	SCOPE	This specification covers the technical requirements of design, Manufacture, performance, testing at manufacturer's works, packing & forwarding, supply and unloading at store/ site, performance of tongue & clevis type Disc polymer insulator complete with all the accessories for trouble free and efficient performance
2	**APPLICABLE STANDARDS**	Insulator shall comply with the requirements stated in the latest editions of the following standards- a) IEC: 61109: Definition, test methods and acceptance criteria for composite insulators for A.C. overhead lines above 1000V. b) IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing c) IS: 2486/ IEC: 60120/IEC: 60372: Specification for insulator fittings for overhead power lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements locking devices d) IEC: 60575: Thermal Mechanical Performance test and mechanical performance test on string insulator units. e) IS: 13134/ IEC: 60815: Guide for the selection of insulators in respect of polluted condition. f) IEC: 60433: Characteristics of string insulator units of the long rod type g) IS: 14329-1995: Malleable Iron Castings h) IS: 60437: Methods of RI Test of HV insulators i) STRI guide 1.92/1: Hydrophobicity Classification Guide. j) CISPR:18-2 part: Radio interference characteristics of overhead power lines and high-voltage equipment k) IS: 8263/ IEC: 260437: Methods of RI Test of HV Insulators l) ANSI C29 13-2000: Standard for insulators – Composite-Distribution Dead-end type m) IS: 4759/ISO: 1459/ ISO: 1461: Hot dip zinc coatings on structural steel & other allied products. n) IS: 2629/ISO: 1461(E): Recommended Practice for Hot, Dip Galvanization for iron and steel. o) IS: 6745/ISO: 1460: Determination of Weight of Zinc Coating on Zinc coated iron and steel articles. p) IS: 3203/IS0: 2178: Methods of testing of local thickness of electroplated coatings. q) IS: 2633: Testing of Uniformity of Coating of zinc coated articles. r) ASTM D 578-05: Standard specification for glass fiber strands. s) ASTM E 1131-03: Standard test method for compositional analysis by Thermo-gravimetric IS: 4699: Specification for refined secondary zinc

3	**CLIMATIC CONDITIONS OF THE INSTALLATION**	i. Maximum Ambient Temperature 50°c ii. Maximum daily average ambient temperature 40°c iii. Minimum Ambient Temperature 2°c iv. Maximum humidity 99.7% v. Minimum humidity 15% vi. Average Annual Rainfall 1800mm vii. Average wind speed prevailing in the area 200kmph viii. Average Thunderstorms prevailing in the area 70 days per annum ix. Average Dust storms prevailing in the area 20 days per annum x. Average number of rainy days per annum 160 xi. Maximum Altitude above sea level 1200m xii. Rainy months June to October The atmosphere across coastal divisions of TPNODL is very saline, laden wi acid anddust suspended during dry months and subjected to fog in cold mont

4. GENETRAL TECHNICAL REQUIREMENTS

SL No.	TECHNICAL PARTICULARS	DESIRED VALUE (Min. requirement for 11 kV 45 KN)
1	Type of Insulator	Polymeric (Tongue & Clevis)
2	Standard according to which the insulators manufactured and tested	IEC 61109
3	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA
(a)	Material of core (FRP rod) (I) E-glass of ECR-glass.	ECR or BORRON FREE
(b)	Material of housing Et weather sheds	High voltage grade SILICON RUBBER
(c)	Material of end fittings	SGI
(d)	Sealing compound for end fittings	RTV SILICON
4	Color of housing	Grey
5	Electrical characteristics	
(a)	Nominal System Voltage	11kV
(b)	Highest System Voltage	12 kV
(c)	Dry Power frequency withstand voltage	70 kV
(d)	Wet Power frequency withstand voltage	50 kV
(e)	Dry flashover voltage	75 kV
(f)	Wet flash over voltage	55 kV
(h)	Dry lighting impulse flashover voltage	
	a) Positive	120 KV

	b) Negative.	120 KV
(i)	FRP rod leakage current at 175 V/mm	< 0.05 mA
(j)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.	< 50 microvolt
(k)	Creepage distance (Min.)	320 MM
6	Minimum failing load.	45 KN
7	Dimensions of insulator	
(i)	Dia of FRP rod	24 mm
(ii)	Length of FRP rod	210 mm
(iii)	Dia of weather sheds	110 mm
(iv)	Thickness of housing	3 mm
(v)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight)	175 mm
8	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression	Injection Moulding
9	Type of sheds	
i)	Aerodynamic	Aerodynamic
ii)	With underbids	
10	Marking/Embossing	TPNODL, Manufacture's name or trademark, Month &Year of Manufacturing.

5	**GENERAL CONSTRUCTIONS**	Polymeric Insulators shall be designed to meet the high quality, safety and reliability and are capable of withstanding a wide range of environmental conditions. Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:- (a) Core- the internal insulating part (b)Housing- the external insulating part (c)Metal end fittings.
5.1	**CORE**	Core shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP rod). Glass fibers and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fiber and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free.

5.2	**POLYMER HOUSING**	The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing. It shall be one- piece housing using only Injection Molding process to cover the core. Primer should be used to bond the housing with FRP rod. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences. Housing shall conform to the requirements of IEC 61109/93-93 with latest amendments. It shall be extruded or directly moulded on core and shall have chemical bonding with the FRP rod. The strength of the bond shall be greater than the tearing strength of the polymer. Sheath material in the bulk as well as in the sealing / bonding area shall be free from voids. All surfaces shall be clean, smooth, without cuts, abrasions or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not generate any radio interference beyond specified limit under the operating conditions.
5.3	**WEATHERSHEDS**	The composite polymer weather sheds made of high voltage grade Silicone rubber polymer shall be molded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution and humidity. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The Weather sheds should have silicon content of minimum 30% by weight. The interface, if any, between sheds and sheath (housing) shall be free from voids. Housing and weather shed material shall have tensile strength of 3 MPa with 400% elongation minimum and tear strength of 16N/mm.
5.4	**METAL END FITTING**	End fittings transmit the mechanical load to the core. They shall be made of Malleable Cast Iron or Spherical Graphite Cast Iron. Hardware of respective specified mechanical load and shall be hot dip galvanized with Zinc coated with minimum 99.95% purity of electrolytic high grade Zinc in accordance with IS 2629. The material used in fittings shall be corrosion resistant. Metal end fittings shall be uniform and without sharp edges or corners and shall be free of cracks, flakes, silvers, slag, blow-holes shrinkages defects and localized porosity. They shall be connected to the rod by means of a controlled compression technique. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be property attached to the core by a coaxial or hexagonal compression process and should not damage the individual fibbers or crack the core. The gap between fittings and sheath shall be sealed by flexible silicone elastomeric compound or silicone alloy compound sealant, system of attached of end fitting to the rod shall provide superior sealing performance between housing, i.e. seamless sheath and metal connection. The sealing must be moisture proof. The dimensions of end fittings of insulators shall be in accordance with the standard dimensions stated in IEC: 60120/IS:2486 Part-II/1989. The finished surface shall be smooth and shall have a good performance. The surface shall not crack or get chipped due to ageing effect under normal and abnormal service conditions or while handling during transit or erection. The design of the fittings and the insulators shall be such that there is no local corona formation or discharges likely to cause the interference to either should or vision transmission.

6.0	**MARKING**:	Each insulator shall be legibly and indelibly marked with "PO no. with date, "Property of TPNODL, Balasore", "CODE NUMBER", along with following: a. Manufacturer's name b. Type designation or serial no. c. Minimum failing load in kN d. No. of relevant standard e. Month and year of manufacture f. Country of manufacture
7.0	**TESTS**:	All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. Following tests for 11kV Tongue & Clevis Disc polymer insulator should be done as per relevant standards: **Type Tests** • Sudden Load Release Test • Thermal Mechanical Pre-Stress Test • Dry Positive and Negative Lightning Impulse Voltage withstand Test • Dry Positive and Negative Lightning Impulse Flashover Voltage Test • Dry and Wet Power Frequency Voltage Withstand Test • Dry and Wet Power Frequency Voltage Flashover Test • Mechanical Failing Load Test • Radio Interference Test • Recovery of Hydrophobicity Test • Dye Penetration Test • Water Diffusion Test • Chemical Composition test for Silicon content • Brittle fracture resistance test • Damage Limit proof and Mechanical withstand test **Routine Tests** • Visual Examination • Mechanical Routine Test • Electrical Routine Test **Acceptance Tests** • Visual examination • Verification of dimensions • Galvanizing Tests • Mechanical performance test • Mechanical Failing Load test
8.0	**TYPE TEST CERTIFICATES**:	The Bidder shall furnish the type test certificates of the 11 KV Tongue & Clevis Disc polymer Insulators for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA/International Laboratory as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost

		implication to TPNODL.
9.0	**PRE DISPATCH INSPECTION**:	The material shall be subject to inspection by a duly authorized representative of the TPNODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPNODL's representatives at all times when the work is in progress. Inspection by the TPNODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL. Following documents shall be sent along with material a) Test reports b) MDCC issued by TPNODL c) TPNODL Invoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee / Warrantee card g) Delivery Challan h) Other Documents (as applicable).
10.0	**INSPECTION AFTER RECEIPT AT STORES**:	The material received at TPNODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering & contracts department.
11.0	**GUARANTEE:**	Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is later, (the time scale of 48/60 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be. Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.
12.0	**PACKING:**	Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.
13.0	**TENDER SAMPLE:**	Bidder shall submit the sample of material with the technical bid (on or before the tender submission date).Sample should be submitted at TPNODL Central store, Balasore by the Bidder and store receipt copy to

		be submitted with the technical bid. Tenders received without sample are liable for rejection.
14.0	**QUALITY CONTROL**	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.
15.0	**MINIMUM TESTING FACILITIES:**	The tenderer must clearly indicate what testing facilities are available in the works of the manufacturer and whether facilities are adequate to carry out all Routine & acceptance Tests. These facilities should be available to TPNODL Engineers if deputed or carry out or witness the tests in the manufacturer works. If any test cannot be carried out at the manufacturer's work, the reasons should be clearly stated in the tender. The insulators shall be tested in accordance with the procedure detailed in IEC 61109 / 92-93 with latest amendments.
16.0	**MANUFACTURING ACTIVITIES:**	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.
17.0	**SPARES, ACCESSORIES AND TOOLS:**	Not Applicable.

18. DRAWINGS AND DOCUMENTS:

Following documents shall be prepared based on TPNODL specifications and statutory requirements with complete BOM and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures
c) Generalized drawing for Insulation Piercing Connector
d) Bill of Material
e) Type test Certificates
f) Experience List.

After the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser.

Following Drawings/Documents shall be submitted after the award of the contract:

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings for all components.		√	
3	Technical details and test certificates of the XLPE compound.		√	√
4	Cross sectional area of the cable	√		√
5	Installation Instructions		√	√
6	Instructions for use		√	√
7	Transport/Post-shipping dimension drawing		√	√
8	QA & QC Plan	√	√	√
9	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish two (2) soft copies (CD) and four (4) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

19. GUARANTEED TECHNICAL PARTICULARS:

Sl No.	Description	As furnished by Bidder
1	Type of Insulator	Bidder has to submit
2	Standard according to which the insulators manufactured and tested	
3	Name of material used in manufacture of the insulator with class/grade)	
(a)	Material of core (FRP rod) (I) E-glass of ECR-glass.	
(b)	Material of housing Et weather sheds	
(c)	Material of end fittings	
(d)	Sealing compound for end fittings	
4	Color of housing	
5	Electrical characteristics	
(a)	Nominal System Voltage	
(b)	Highest System Voltage	
(c)	Dry Power frequency withstand voltage	
(d)	Wet Power frequency withstand voltage	
(e)	Dry flashover voltage	
(f)	Wet flash over voltage	
(g)	Dry lighting impulse withstand voltage	

	(a) Positive
	(b) Negative
(h)	Dry lighting impulse flashover voltage
	a) Positive
	b) Negative.
(i)	FRP rod leakage current at 175 V/mm
(j)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.
(k)	Creepage distance (Min.)
6	Minimum failing load.
7	Dimensions of insulator
(i)	Weight
(ii)	Dia of FRP rod
(iii)	Length of FRP rod
(iv)	Dia of weather sheds
(v)	Thickness of housing
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight)
9	Type of sheds
i)	Aerodynamic
ii)	With underbids
10	Marking/Embossing

20.0 SCHEDULE OF DEVIATIONS (TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

S. No	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation

CONTENTS

1	**SCOPE:**	This specification covers the technical requirements of design, manufacture, performance, testing at manufacturer's works, packing & forwarding, supply and unloading at store/ site, performance of Ball and Socket Disc polymer insulator complete with all the accessories for trouble free and efficient performance.
2	**APPLICABLE STANDARDS**:	Insulator shall comply with the requirements stated in the latest editions of the following standards- a) IEC: 61109: Definition, test methods and acceptance criteria for composite insulators for A.C. overhead lines above 1000V. b) IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing c) IS: 2486/ IEC: 60120/IEC: 60372: Specification for insulator fittings for overhead power lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements locking devices d) IEC: 60575: Thermal Mechanical Performance test and mechanical performance test on string insulator units. e) IS: 13134/ IEC: 60815: Guide for the selection of insulators in respect of polluted condition. f) IEC: 60433: Characteristics of string insulator units of the long rod type g) IS: 14329-1995: Malleable Iron Castings h) IS: 60437: Methods of RI Test of HV insulators i) STRI guide 1.92/1: Hydrophobicity Classification Guide. j) CISPR:18-2 part: Radio interference characteristics of overhead power lines and high-voltage equipment k) IS: 8263/ IEC: 260437: Methods of RI Test of HV Insulators l) ANSI C29 13-2000: Standard for insulators – Composite-Distribution Dead-end type m) IS: 4759/ISO: 1459/ ISO: 1461: Hot dip zinc coatings on structural steel & other allied products. n) IS: 2629/ISO: 1461(E): Recommended Practice for Hot, Dip Galvanization for iron and steel. o) IS: 6745/ISO: 1460: Determination of Weight of Zinc Coating on Zinc coated iron and steel articles. p) IS: 3203/IS0: 2178: Methods of testing of local thickness of electroplated coatings. q) IS: 2633: Testing of Uniformity of Coating of zinc coated articles. r) ASTM D 578-05: Standard specification for glass fiber strands. s) ASTM E 1131-03: Standard test method for compositional analysis by Thermo-gravimetric t) IS: 4699: Specification for refined secondary zinc

	CLIMATIC CONDITIONS OF THE INSTALLATION	i. Maximum Ambient Temperature	50°c
		ii. Maximum daily average ambient temperature	40°c
		iii. Minimum Ambient Temperature	2°c
		iv. Maximum humidity	99.7%
		v. Minimum humidity	15%
		vi. Average Annual Rainfall	1800mm
		vii. Average wind speed prevailing in the area	200kmph
		viii. Average Thunderstorms prevailing in the area	70 days per annum
		ix. Average Dust storms prevailing in the area	20 days per annum
		x. Average number of rainy days per annum	160
		xi. Maximum Altitude above sea level	1200m
		xii. Rainy months	June to October
		The atmosphere across coastal divisions of TPNODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months.	

4.0 GENERAL TECHNICAL REQUIREMENTS

Sl No.	Description	Unit	Requirements
1	Type of Insulator		Polymeric 11 kV Ball and Socket Disc Insulator
2	Standard according to which the insulators manufactured and tested		IEC 61109
3	Material of housing and weather sheds		High voltage grade Silicone Rubber
(a)	Material of Core (FRP rod)	kV	ECR BORON FREE
(b)	Material of end fittings	Hz	SGI Cast/Forged Steel
(c)	Sealing compound for end fittings		Silicone Sealant
4	Color of housing	KN	Grey
5	Electrical characteristics		
(a)	Nominal System Voltage	kV	11
(b)	Highest System Voltage	kV	12
c)	Dry Power frequency withstand voltage	kV	70
(d)	Wet power frequency withstand voltage	kV (rms)	50
(e)	Dry flashover voltage	kV	75
(f)	Wet flash over voltage	kV	55
(g)	Dry lighting impulse withstand voltage		
	(a) Positive		120 kVp
	(b) Negative		120 kVp
(h)	Visible Discharge Test Voltage	kV	9
(i)	Minimum creepage distance	mm	320
(j)	Inclined plane tracking and erosion resistance of housing	kV	4.5kV for 360 minutes
(k)	FRP rod leakage current at 175 V/mm	mA	<0.05mA
6	Minimum Failing load	kN	45
7	Dimensions of insulator		

(i)	Dia of FRP rod	mm	24 mm
(ii)	Length of FRP rod	mm	210 mm
(iii)	Dia of weather sheds	mm	110 mm
(iv)	Thickness of housing	mm	3 mm
(v)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight)	mm	175 mm
8	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression		Injection Moulding
9	Type of sheds		
i)	Aerodynamic		Aerodynamic
ii)	With underbids		
10	Marking/Embossing		TPNODL, Manufacture's name or trademark, Month &Year of Manufacturing.

5	**GENERAL CONSTRUCTIONS**	Polymeric Insulators shall be designed to meet the high quality, safety and reliability and can withstand a wide range of environmental conditions. Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:- (a) Core- the internal insulating part (b)Housing- the external insulating part (c)Metal end fittings.
5.1	**CORE**	Core shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP rod). Glass fibers and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fiber (minimum 80%) and shall exhibit both high electrical integrity and high resistance to acid corrosion. FRP Rod Diameters Should be minimum 16mm for 45KN ball and socket insulator. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free.
5.2	**POLYMER HOUSING**	The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing. It shall be one- piece housing using only Injection Molding process to cover the core. Primer should be used to bond the housing with FRP rod. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences. Housing shall conform to the requirements of IEC 61109/93-93 with latest amendments. It shall be extruded or directly molded on core and shall have chemical bonding with the FRP rod. The strength of the bond shall be greater than the tearing strength of the polymer. Sheath material in the bulk as well as in the sealing / bonding area shall be free from voids. All surfaces shall be clean, smooth, without cuts, abrasions, or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not generate any radio interference beyond specified limit under the operating conditions.
5.3	**WEATHERSHEDS**	The composite polymer weathersheds made of high voltage grade Silicone rubber polymer shall be molded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution, and humidity. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The Weathersheds should have silicon content of minimum 30% by weight. The interface, if any, between sheds and sheath (housing) shall be free from voids.

		Housing and weather shed material shall have tensile strength of 3 MPa with 400% elongation minimum and tear strength of 16N/mm.
5.4	**HARDWARE FITTINGS**	a) Ball pin and socket couplings: Ball pin and socket shall be of forged steel and dimensions are as specified in IS 2486 (Part-2): 1989. Insulator metal caps shall be made of malleable cast iron conforming to IS 14329: 1995. b) Locking device of the coupling: The security clips to be used as a locking device for ball and socket coupling shall be 'R' shaped hump type or 'W' type as per IS 2486. The locking device shall be resilient, corrosion resistant, and of suitable mechanical strength. Material to be used for 'W' locking clip is phosphor bronze and for 'R' type locking clip is stainless steel. The hardness and temper of material are important for their satisfactory operation. The locking devices shall retain their ability after being operated from the locking to the coupling position at least twenty times at normal temperature. They should be effective at the lowest temperature likely to be encountered in service. Socket for use with W-clips have the lower edge of the rectangular slot at the level of bottom of the socket. The slot is so shaped that it will accept the W-clip and retain it in two distinct positions when operated for coupling and locking. The shape of the W-clip is such that complete withdrawal when moving from the locking to the coupling position prevented c) All ferrous parts shall be hot dip galvanized in accordance with the latest edition of IS 2629-1985. The Zinc to be used for galvanizing shall conform to grade Zn 99.99 as per IS 209-1992. The Zinc coating shall be uniform, smoothly adherent, reasonably bright, continuous and free from impurities such as flux, ash, rust stains, bulky white deposits and blisters. Before ball fittings are galvanized, all die flashing on the shank and on the bearing surface of the ball shall be carefully removed without reducing the design dimensional requirements
6.0	**MARKING**:	Each insulator box shall be legibly and indelibly marked with "PO no. with moth and year of manufacturing, "Property of TPNODL, BALASORE", "CODE NUMBER", along with following: a. Manufacturer's name b. Type designation or serial no. c. Minimum failing load in kN d. No. of relevant standard e. Month and year of manufacture f. Country of manufacture Each insulator shall be embossed with Manufacturer name/Logo.
7.0	**TESTS**	All routine, acceptance and type tests shall be witnessed by the purchaser/his authorized representative. Following tests for 11kV Ball and Socket Disc polymer insulator should be done as per relevant standards:

7.1	**TYPE TESTS OF COMPLETE POLYMER INSULATORS**	• Dry lightning impulse withstand voltage test. • Wet power frequency test. • Mechanical failing load test. • Radio interference test. • Mechanical performance test U.V Resistance as per ASTM G 53: 1000 Hrs - UV Light for 8 Hours and condensation for 4 hours in a continuous cycle. Elongation to be limited to 20% (% Elongation to break before and after the test). • Salt Fog test: On insulators for 1000 hours as per IEC. • Galvanization test. • Visual examination. • Verification of dimensions. • Bending test. • Verification of the locking system or the tightness of the interface between end fitting and insulator housing. • Assembled core load time test. • Determination of the average failing load of the core of the assembled insulator.
7.2	**TYPE TESTS ON SILICONE RUBBER**	• Tensile Strength & Elongation • Tear Strength • Inclined Plane Tracking & Erosion • Volume resistivity • Dielectric Strength • Dielectric Constant • Density • Hardness • Arc Resistance • Silicone content • Flammability • Resistance to weathering & UV. • Limiting oxygen index test. • Specific gravity.
7.3	**TYPE TESTS ON FRP RODS**	• Verification of dimensions. • Specific Gravity • Glass Content • Water Diffusion Test • Hardness • Dye Penetration Test. • Flexural strength. • Water absorption. • Brittle fracture resistance test. • Visible discharge test. • Dry lightning impulse withstand voltage test. • Wet power frequency withstand voltage test. • Power Arc test. • Accelerated weathering test. • Tracking & erosion test.

7.4	**TYPE TESTS ON END FITTINGS**	• Thickness of Zinc Coating • Uniformity of Zinc Coating • Micro-structural of metal fitting.
7.5	**DESIGN TESTS**	For composite insulators it is essential to carry out design test as per clause 4.1 of IEC 61109 / 92-93 with latest amendments. The design tests are intended to verify the suitability of the design, materials and method of manufacture (technology). When a composite insulator is submitted to the design tests, the result shall be considered valid for the whole class of insulators, which are represented by the one tested and having the following characteristics: • The materials for the core, and sheds and same manufacturing method; • The material of the fittings, the same design, the same method of attachment; • Polymer insulator should have greater layer thickness of the shed material over the core (including a sheath where used); • Polymer insulator should have smaller ratio of the highest system voltage to insulation length; • Polymer insulator should have smaller ratio of all mechanical loads to the smallest core diameter between fittings • Polymer insulator should have greater diameter of the core. The tested composite insulators shall be identified by a drawing giving all the dimensions with the manufacturing tolerances. Manufacturer should submit test reports for Design Tests as per IEC – 61109 (clause – 5) along with the bid. Additionally following tests shall be carried out or reports for the tests shall be submitted after award of contract: UV test: the test shall be carried out in line with clause 7.2 of ANSI C29.13. In addition, chemical composition test for silicon content would also be added in the testing list.
7.6	**ROUTINE TESTS**	• Visual Examination (Free from void, cavity, foreign particle and scratch/nick spot). • Mechanical Routine Test • Electrical Routine Test
7.7	**ACCEPTANCE TESTS**	• End Sealing test (FRP rod and Silicone rubber housing). • Visual examination (Free from void, cavity, foreign particle and scratch/nick spot). • Verification of dimensions. • Galvanizing Tests. • Bending load test. • Mechanical performance test. • Mechanical Failing Load test. • Dry power frequency withstand voltage test • Wet power frequency withstand voltage test.
8.0	**TYPE TEST CERTIFICATES**:	The Bidder shall furnish the type test certificates of the 11 KV Ball and Socket Disc polymer Insulators for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at

		CPRI/ERDA/International Laboratory as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPNODL.
9.0	**PRE DISPATCH INSPECTION**:	The material shall be subject to inspection by a duly authorized representative of the TPNODL. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall always grant free access to the places of manufacture to TPNODL's representatives when the work is in progress. Inspection by the TPNODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL. Following documents shall be sent along with material a) Test reports b) MDCC issued by TPNODL c) TPNODL Invoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee / Warrantee card g) Delivery Challan h) Other Documents (as applicable).
10.0	**INSPECTION AFTER RECEIPT AT STORES**:	The material received at TPNODL, BALASORE, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering & contracts department.
11.0	**GUARANTEE:**	Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is later, (the time scale of 48/60 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be. Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.
12.0	**PACKING:**	Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.

13.0	**TENDER SAMPLE:**	Bidder shall submit the sample of material with the technical bid (on or before the tender submission date).Sample should be submitted at TPNODL Central store, Balasore by the Bidder and store receipt copy to be submitted with the technical bid. Tenders received without sample are liable for rejection.
14.0	**QUALITY CONTROL**	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.
15.0	**MINIMUM TESTING FACILITIES:**	The tenderer must clearly indicate what testing facilities are available in the works of the manufacturer and whether facilities are adequate to carry out all Routine & acceptance Tests. These facilities should be available to TPNODL Engineers if deputed or carry out or witness the tests in the manufacturer works. If any test cannot be carried out at the manufacturer's work, the reasons should be clearly stated in the tender. The insulators shall be tested in accordance with the procedure detailed in IEC 61109 / 92-93 with latest amendments.
16.0	**MANUFACTURING ACTIVITIES:**	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.
17.0	**SPARES, ACCESSORIES AND TOOLS:**	Not Applicable.
18.0	**DRAWINGS AND DOCUMENTS:** Following documents shall be prepared based on TPNODL specifications and statutory requirements with complete BOM and shall be submitted with the bid: a) Completely filled in Technical Particulars b) General description of the equipment and all components including brochures c) Generalized drawing for Disc Insulator d) Bill of Material e) Type test Certificates f) Experience List. After the after of the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser. Following Drawings/Documents shall be submitted after the award of the contract:	

S. No	Description	For Approval	For Review Information	Final Submission

		1	Technical Parameters	√		√
		2	General Arrangement drawings	√		√
		3	Terminal and connection drawings	√		√
		4	Manual catalogue		√	
		5	Installation/Commissioning Manuals		√	
		6	Instructions for use		√	
		7	Transport/shipping dimension drawing		√	
		8	QA & QC Plan	√	√	√
		9	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish two (2) soft copies (CD) and four (4) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

19.0 **GUARANTEED TECHNICAL PARTICULARS:**

Sl No.	Description	As furnished by Bidder
1	Type of Insulator	Bidder has to submit
2	Standard according to which the insulators manufactured and tested	
3	Name of material used in manufacture of the insulator with class/grade)	
(a)	Material of core (FRP rod) (I) E-glass of ECR-glass.	
(b)	Material of housing Et weather sheds	
(c)	Material of end fittings	
(d)	Sealing compound for end fittings	
4	Color of housing	
5	Electrical characteristics	
(a)	Nominal System Voltage	
(b)	Highest System Voltage	
(c)	Dry Power frequency withstand voltage	
(d)	Wet Power frequency withstand voltage	
(e)	Dry flashover voltage	
(f)	Wet flash over voltage	

(g)	Dry lighting impulse withstand voltage
	(a) Positive
	(b) Negative
(h)	Dry lighting impulse flashover voltage
	a) Positive
	b) Negative.
(i)	FRP rod leakage current at 175 V/mm
(j)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.
(k)	Creepage distance (Min.)
6	Minimum failing load.
7	Dimensions of insulator
(i)	Weight
(ii)	Dia of FRP rod
(iii)	Length of FRP rod
(iv)	Dia of weather sheds
(v)	Thickness of housing
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight)
9	Type of sheds
i)	Aerodynamic
ii)	With underbids
10	Marking/Embossing

20.0	**SCHEDULE OF DEVIATIONS** **(TO BE ENCLOSED WITH TECHNICAL BID)**	**(TO BE ENCLOSED WITH TECHNICAL BID)** All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

S.No.	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Designation
Signature

CONTENTS

1	**SCOPE:**	This specification covers the technical requirements of design, manufacture, test at manufacturer's works, packing & forwarding, supply and unloading at store/ site of 11 KV Post polymer insulator 5kN used in 11 KV Overhead Transmission lines.
2	**APPLICABLE STANDARDS**:	Insulator shall comply with the requirements stated in the latest editions of the following standards- a) IEC: 61109: Definition, test methods and acceptance criteria for composite insulators for A.C. overhead lines above 1000V. b) IEC: 61952: Insulators for overhead lines – Composite line post insulators for alternative current. c) IEC: 62231: Testing procedure for Station Post Polymer Insulator d) IS: 2071/ IEC: 60060-1: Methods of High Voltage Testing. e) IS: 2486/ IEC: 60120: Specification for Insulator fittings for Overhead power Lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements Locking Devices. f) IEC: 60575: Thermal Mechanical Performance test and mechanical performance test on string insulator units. g) IS: 13134/ IEC: 60815: Guide for the selection of insulators in respect of polluted condition. h) STRI guide 1.92/1: Hydrophobicity Classification Guide. i) IEC: 60437: Methods of RI Test of HV insulators. j) IS: 4759: Hot dip zinc coatings on structural steel & other allied products. k) IS: 2629: Recommended Practice for Hot, Dip Galvanization for iron and steel. l) IS: 6745: Determination of Weight of Zinc Coating on Zinc coated iron and steel articles. m) IS: 2633: Testing of Uniformity of Coating of zinc coated articles. n) ASTM D 578-05: Standard specification for glass fiber strands.
3	**CLIMATIC CONDITIONS OF THE INSTALLATION** The service conditions shall be as follows: i. Maximum Ambient Temperature 50°c ii. Maximum daily average ambient temperature 40°c iii. Minimum Ambient Temperature 2°c iv. Maximum humidity 99.7% v. Minimum humidity 15% vi. Average Annual Rainfall 1800mm vii. Average wind speed prevailing in the area 200kmph viii. Average Thunderstorms prevailing in the area 70 days per annum	

	ix.	Average Dust storms prevailing in the area	20 days per annum
	x.	Average number of rainy days per annum	160
	xi.	Maximum Altitude above sea level	1200m
	xii.	Rainy months	June to October
	The atmosphere across coastal divisions of TPNODL is very saline, laden with salt, acid and dust suspended during dry months and subjected to fog in cold months.		

4	General Technical Requirements	
Sr.	**Description**	**TPNODL Requirement**
1	Type of insulator	11kV 05KN Polymeric composite POST Insulator
2	Reference Standard	IEC 62231, IEC 61109
3	Material of FRP Rod	ECR, Boron free
4	Material of sheds	Silicon Rubber
5	Minimum silicone content in weather sheds	30% by weight
6	Method of fixing of metal end fittings to rod	Injection Moulding
7	Pitch Circle Diameter (PCD)	57 mm
8	Inclination of Shed	4 to 5 degree
9	Type of Top End Fittings	SGCI/MCI, Hot Dip Galvanized
10	Material of Bottom & Top end fittings	SGI Cast / Forged Steel , Hot Dip Galvanized
11	Material of sealing compound	RTV Silicon
12	Colour of sheds	Grey
13	Rated voltage	11 KV
14	Highest voltage	12 KV
15	Frequency	50 Hz
16	Dry Power Frequency Withstand voltage	60 KV
17	Wet Power Frequency Withstand voltage	35 KV
18	Dry PF Flashover Voltage	75 KV
19	Wet PF Flashover Voltage	45 KV
20	Dry Lightning Impulse withstand voltage	Positive:75KV, Negative:80KV
	Positive , Negative	
21	Dry Lightning Impulse Flashover voltage	Positive:85KV, Negative:95KV
	Positive, Negative	
22	Visible Discharge Voltage (PF)	9 kV
23	RIV at 1MHz when energized at 10KV (rms) under dry condition	<50 microvolt
24	Creepage distance(min)	320 mm
25	Minimum Failing load - (Mechanical Load)	
a	Bending Load / Cantiliver Load	5 KN
b	Tensile Load	20 KN
26	Diameter of FRP Rod (min)	Ø24 mm
27	Length of FRP Rod (min)	200 mm

28	Dia of weather sheds (min)	Ø110 mm
29	Thickness of housing (min)	3 mm
30	Dry arc distance (min)	170 mm
31	Method of fixing sheds to housing	Injection Moulding
32	No of weather sheds (min)	3
33	Type of sheds	Aerodynamic
34	Shed Profile	Parallel
35	Number of Holes & Hole Dia (Top & Bottom)	4 Nos.& Ø M12
36	Pitch Circle Diameter (PCD)	57 mm
37	Sectional Length or Total Height	254±10 mm
38	Weight of Composite Insulator (min)	1 kg
39	Type of packing	Corrugated Box /HDPE Bag
40	No of insulator in each pack (max)	20 Nos.
41	Gross weight of package (max)	25 kg
42	Marking	Trade Mark or Mfg name : ……. , Bending Load: 05 KN Voltage Rating: 11kV , Mfg Date: MM/YY, Customer Name: TPNODL
43	Drawing	Detailed drawing must be enclosed alongwith GTP.

5	**GENERAL CONSTRUCTIONS**	Polymeric Insulators shall be designed to meet the high quality, safety and reliability and can withstand a wide range of environmental conditions. Polymeric Insulators shall consist of THREE parts, at least two of which are insulating parts:- (a) Core- the internal insulating part (b)Housing- the external insulating part (c)Metal end fittings.
5.1	**CORE**	Core shall be a glass-fiber reinforced epoxy resin rod of high strength (FRP rod). Glass fibers and resin shall be optimized in the FRP rod. Glass fibers shall be Boron free electrically corrosion resistant (ECR) glass fiber and shall exhibit both high electrical integrity and high resistance to acid corrosion. The matrix of the FRP rod shall be Hydrolysis resistant. The FRP rod shall be manufactured through Pultrusion process. The FRP rod shall be void free and should have high resistance to acid corrosion. Electrically Corrosion Resistant (ECR) grade fiber glass reinforced plastic (FRP) rod having at least 70% fibres by weight.
5.2	**POLYMER HOUSING**	The FRP rod shall be covered by a seamless sheath of high voltage grade Silicone rubber housing. It shall be one- piece housing using only Injection Molding process to cover the core. Primer should be used to bond the housing with FRP rod. The housing shall be designed to provide the necessary creepage distance and protection against environmental influences. Housing shall conform to the requirements of IEC 60815 with latest amendments. All surfaces shall be clean, smooth, without cuts, abrasions, or projections. No part shall be subjected to excessive localized pressure. The insulator and metal parts shall be so designed and manufactured that it shall avoid local corona formation and not

		generate any radio interference beyond specified limit under the operating conditions.
5.3	**WEATHERSHEDS**	The composite polymer weathersheds made of high voltage grade Silicone rubber polymer shall be molded as part of the sheath and shall be free from imperfections. It should protect the FRP rod against environmental influences, external pollution, and humidity. The strength of the weather shed to sheath interface shall be greater than the tearing strength of the polymer. The interface, if any, between sheds and sheath (housing) shall be free from voids. Housing and weather shed material shall have tensile strength of 3 MPa with 400% elongation minimum and tear strength of 16N/mm
5.4	**METAL END FITTINGS**	End fitting transmit the mechanical load to the core. They shall be made of spheroidal graphite cast iron, malleable cast iron or forged steel or aluminum alloy. Metal end fitting shall be suitable for Post type hardware support of respective specified mechanical load and shall be hot dip galvanized in accordance with IS 2629. They shall be connected to the rod by means of a controlled compression technique. The OD of end fittings should be machined to make the surface uniform round to ensure effective sealing when housing is molded over it. The material used in fittings shall be corrosion resistant. As the main duty of the end fittings is the transfer of mechanical loads to the core the fittings should be properly attached to the core by a coaxial or hexagonal compression process & should not damage the individual fibers or crack the core. The dimensions of end fittings of insulators shall be in accordance with the standard dimensions stated in IEC: 60120/ IS: 2486 - Part-II /1989. Outer portion of Post should be Zinc sleeved with minimum 99.95% purity of Electrolytic high grade zinc. Bottom end metal fitting (Shank) of Post insulator should be forged steel as per IS 2002/92. Bottom end fitting should be single unit without any joints. Nuts as per IS 1363 (P-III) and spring washer shall be as per IS 3063 with Latest amendments if any, Nuts and spring washer shall be hot dip galvanized. The design of the insulator shall be such that stresses due to expansion and contraction in any part of the insulators shall not lead to deterioration. The Post insulator shall not engage directly with hard metal.
6.0	**MARKING**:	Each insulator shall be legibly and indelibly marked with “PO no. with date, “Property of TPNODL, BALASORE Odisha”, “CODE NUMBER”, along with following: a. Manufacturer’s name b. Type designation or serial no. c. Minimum failing load in kN d. No. of relevant standard e. Month and year of manufacture f. Country of manufacture
7.0	**TESTS**:	All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. Following tests for 11kV Post Polymer insulator should be done as per relevant standards: **Tests on Silicone Rubber:** • Tensile Strength & Elongation • Tear Strength • Inclined Plane Tracking & Erosion • Volume resistivity • Dielectric Strength • Dielectric Constant

		• Density • Hardness • Arc Resistance • Silicone content • Flammability • Resistance to weathering & UV. • Limiting oxygen index test. • Specific gravity. **Tests on FRP Rods:** • Verification of dimensions. • Specific Gravity • Glass Content • Water Diffusion Test • Hardness • Dye Penetration Test. • Flexural strength. • Water absorption. • Brittle fracture resistance test. • Visible discharge test. • Dry lightning impulse withstand voltage test. • Wet power frequency withstand voltage test. • Power Arc test. • Accelerated weathering test. • Tracking & erosion test. **Tests on End Fittings**: • Thickness of Zinc Coating • Uniformity of Zinc Coating • Micro-structural of metal fitting. **Test of Complete polymer insulators:** • Dry lightning impulse withstand voltage test. • Wet power frequency test. • Mechanical failing load test. • Radio interference test. • Mechanical performance test U.V Resistance as per ASTM G 53: 1000 Hrs - UV Light for 8 Hours and condensation for 4 hours in a continuous cycle. Elongation to be limited to 20% (% Elongation to break before and after the test). • Salt Fog test: On insulators for 1000 hours as per IEC. • Galvanization test. • Visual examination. • Verification of dimensions. • Bending test. • Verification of the locking system or the tightness of the interface between end fitting and insulator housing. • Assembled core load time test. • Determination of the average failing load of the core of the assembled insulator. **Design Tests:** For composite insulators it is essential to carry out design test as per clause 4.1

		of IEC 61109 / 92-93 with latest amendments. The design tests are intended to verify the suitability of the design, materials and method of manufacture (technology). When a composite insulator is submitted to the design tests, the result shall be considered valid for the whole class of insulators, which are represented by the one tested and having the following characteristics: • The materials for the core, and sheds and same manufacturing method; • The material of the fittings, the same design, the same method of attachment; • Polymer insulator should have greater layer thickness of the shed material over the core (including a sheath where used); • Polymer insulator should have smaller ratio of the highest system voltage to insulation length; • Polymer insulator should have smaller ratio of all mechanical loads to the smallest core diameter between fittings • Polymer insulator should have greater diameter of the core. The tested composite insulators shall be identified by a drawing giving all the dimensions with the manufacturing tolerances. Manufacturer should submit test reports for Design Tests as per IEC – 61109 (clause – 5) along with the bid. Additionally following tests shall be carried out or reports for the tests shall be submitted after award of contract: UV test: the test shall be carried out in line with clause 7.2 of ANSI C29.13. In addition, chemical composition test for silicon content would also be added in the testing list. **Acceptance Tests** For Composite Insulators • Verification of dimensions • Visual examination • Verification of the locking system or the tightness of the interface between end fitting and insulator housing • Galvanizing test • Verification of the specified mechanical load • Bending load test • Dry power frequency withstand voltage test • Analysis of material properties of housing material • Analysis of material properties of core material **Routine Tests** • Visual Examination • Mechanical load test as per IEC 61109 & IEC 62231 •
8.0	**TYPE TEST CERTIFICATES**:	The Bidder shall furnish the type test certificates of the 11 KV Post polymer Insulators for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA/International Laboratory as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to TPNODL, Odisha.

9.0	**PRE DISPATCH INSPECTION**:	The material shall be subject to inspection by a duly authorized representative of the TPNODL, Odisha. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TPNODL, Odisha representatives always when the work is in progress. Inspection by the TPNODL, Odisha or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPNODL, Odisha. Following documents shall be sent along with material a) Test reports b) MDCC issued by TPNODL, Odisha c) TPNODL, Odisha Invoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee / Warrantee card g) Delivery Challan h) Other Documents (as applicable).
10.0	**INSPECTION AFTER RECEIPT AT STORES**:	The material received at TPNODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering & contracts department.
11.0	**GUARANTEE:**	Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later, (the time scale of 12/24 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be. Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.
12.0	**PACKING:**	Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.
13.0	**TENDER SAMPLE:**	3 no's sample shall be submitted by the bidder with the technical bid. Tender received without sample are liable for rejection.

14.0	**QUALITY CONTROL**	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.
15.0	**MINIMUM TESTING FACILITIES:**	The tenderer must clearly indicate what testing facilities are available in the works of the manufacturer and whether facilities are adequate to carry out all Routine & acceptance Tests. These facilities should be available to TPNODL, Odisha Engineers if deputed or carry out or witness the tests in the manufacturer works. If any test cannot be carried out at the manufacturer's work, the reasons should be clearly stated in the tender. The insulators shall be tested in accordance with the procedure detailed in IEC 61109 / 92-93 with latest amendments.
16.0	**MANUFACTURING ACTIVITIES:**	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.
17.0	**SPARES, ACCESSORIES AND TOOLS:**	Not Applicable.
18.0	**DRAWINGS AND DOCUMENTS:**	

Following documents shall be prepared based on TPNODL, Odisha specifications and statutory requirements with complete BOM and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures
c) Generalized drawing for Insulation Piercing Connector
d) Bill of Material
e) Type test Certificates
f) Experience List.

After the after of the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, test certificates shall be submitted after the final approval of the same to the purchaser.

Following Drawings/Documents shall be submitted after the award of the contract:

S. No	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	Manual/Catalogues/drawings		√	

	for all components.			
3	Technical details and test certificates of the XLPE compound.		√	√
4	Cross sectional area of the cable	√		√
5	Installation Instructions		√	√
6	Instructions for use		√	√
7	Transport/shipPostg dimension drawing		√	√
8	QA & QC Plan	√	√	√
9	Routine, Acceptance and Type test Certificates	√	√	√

All the Documents and Drawings shall be in English Language.

Instruction Manuals: Bidder shall furnish two (2) soft copies (CD) and four (4) hard copies of nicely bound manual (in English Language) covering erection and maintenance instructions and all relevant information pertaining to the main equipment as well as auxiliary devices.

4	**General Technical Particulars**		
Sr.	**Description**	**TPNODL Requirement**	**BIDDER OFFER**
1	Type of insulator	11kV 05KN Polymeric composite POST Insulator	
2	Reference Standard	IEC 62231, IEC 61109	
3	Material of FRP Rod	ECR, Boron free	
4	Material of sheds	Silicon Rubber	
5	Minimum silicone content in weather sheds	30% by weight	
6	Method of fixing of metal end fittings to rod	Injection Moulding	
7	Pitch Circle Diameter (PCD)	57 mm	
8	Inclination of Shed	4 to 5 degree	
9	Type of Top End Fittings	SGCI/MCI, Hot Dip Galvanized	
10	Material of Bottom & Top end fittings	SGI Cast / Forged Steel , Hot Dip Galvanized	
11	Material of sealing compound	RTV Silicon	
12	Colour of sheds	Grey	
13	Rated voltage	11 KV	
14	Highest voltage	12 KV	
15	Frequency	50 Hz	
16	Dry Power Frequency Withstand voltage	60 KV	
17	Wet Power Frequency Withstand voltage	35 KV	
18	Dry PF Flashover Voltage	75 KV	

19	Wet PF Flashover Voltage	45 KV	
20	Dry Lightning Impulse withstand voltage	Positive:75KV, Negative:80KV	
	Positive , Negative		
21	Dry Lightning Impulse Flashover voltage	Positive:85KV, Negative:95KV	
	Positive, Negative		
22	Visible Discharge Voltage (PF)	9 kV	
23	RIV at 1MHz when energized at 10KV (rms) under dry condition	<50 microvolt	
24	Creepage distance(min)	320 mm	
25	Minimum Failing load - (Mechanical Load)		
a	Bending Load / Cantiliver Load	5 KN	
b	Tensile Load	20 KN	
26	Diameter of FRP Rod (min)	Ø24 mm	
27	Length of FRP Rod (min)	200 mm	
28	Dia of weather sheds (min)	Ø110 mm	
29	Thickness of housing (min)	3 mm	
30	Dry arc distance (min)	170 mm	
31	Method of fixing sheds to housing	Injection Moulding	
32	No of weather sheds (min)	3	
33	Type of sheds	Aerodynamic	
34	Shed Profile	Parallel	
35	Number of Holes & Hole Dia (Top & Bottom)	4 Nos.& Ø M12	
36	Pitch Circle Diameter (PCD)	57 mm	
37	Sectional Length or Total Height	254±10 mm	
38	Weight of Composite Insulator (min)	1 kg	
39	Type of packing	Corrugated Box /HDPE Bag	
40	No of insulator in each pack (max)	20 Nos.	
41	Gross weight of package (max)	25 kg	
42	Marking	Trade Mark or Mfg name : ……. , Bending Load: 05 KN Voltage Rating: 11kV , Mfg Date: MM/YY, Customer Name: TPNODL	
43	Drawing	Detailed drawing must be enclosed alongwith GTP.	

20.0	**SCHEDULE OF DEVIATIONS** **(TO BE ENCLOSED WITH TECHNICAL BID)**	

Initiator	Suryakanta Mohanty	HOD (Engineering)	Sandip P.D.

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

S. No	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation