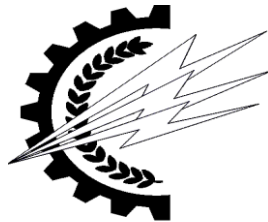


# **M.P.MADHYA KSHETRA VIDYUT VITARAN CO.LTD.**

**(A Wholly Owned Govt. of M.P. Undertaking)**

# **BHOPAL**



प्रकाश एवं विकास

## **TENDER SPECIFICATION NO.CMD/MK/04/226 (DUE FOR OPENING ON 09.09.11) FOR SUPPLY OF**

*11 KV & 33 KV LONG ROD 45 KN COMPOSITE POLYMER (T&C) DISC  
INSULATORS*

*11 KV & 33 KV POLYMER PIN INSULATORS AND 11 KV & 33 KV POST  
INSULATORS*

**CHIEF GENERAL MANAGER (PUR),  
OFFICE OF THE CHAIRMAN AND MANAGING DIRECTOR,  
M.P.MADHYA KSHETRA VIDYUT VITARAN Co. LTD.,  
NISHTHA PARISAR, BIJLEE NAGAR, GOVINDPURA,  
BHOPAL-462023**

**PHONE NO.(0755)- 2678280, 2678325**

**FAX NO. (0755)- 2589821**

**Website – [www.madhyavitaran.nic.in](http://www.madhyavitaran.nic.in)**

**OFFICE OF THE CHAIRMAN AND MANAGING DIRECTOR  
M.P. MADHYA KSHETRA VIDYUT VITARAN CO. LTD  
NISHTHA PARISAR, GOVINDPURA,  
BHOPAL - 462023**

TENDER SPECIFICATION NO. **CMD/MK/04/226**

DUE FOR OPENING : **09.09.11**

**Name of Item**

*11 KV & 33 KV LONG ROD 45 KN COMPOSITE POLYMER (T&C) DISC INSULATORS  
11 KV & 33 KV POLYMER PIN INSULATORS AND 11 KV & 33 KV POST INSULATORS*

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## OFFICE OF THE CHAIRMAN & MANAGING DIRECTOR M.P.MADHYA KSHETRA VIDYUT VITARAN CO. LTD.

(A Wholly Owned Govt. of M.P.Undertaking)

NISHTHA PARISAR, BIJLINAGAR,GOVINDPURA, BHOPAL-462023

Phone:, 2678325, 2678280, Fax No.2589821 E.mail sepurchase@mpmkvvc.com

### TENDER – NOTICE

Online tenders are invited for supply of following items from **manufacturers only** as per Tender Specifications. The Bid Seals (Hashes) will be received online on the portal <http://mpmkvvc.mpeprocurement.gov.in> up to date & time indicated below. The Tenders will be opened in the office of the undersigned as mentioned in tender time schedule (key date). If desired, the bidder or their duly authorised representative may remain present at the time of opening of tender.

TENDER SPECN. NUMBER	NAME OF ITEMS & QUANTITY TENDERED	APPROX VALUE (Rs. in Lakhs)	TENDER FEE (in Rs.)	DATE OF OPENING OF TECH.BID OF TENDER
CMD/MK/ 04/226	33 KV Polymer Pin 10 KN : 15000 nos. 11 KV Polymer Pin 5 KN : 80000 nos. 33 KV Polymer Disc Insulator : 16000 nos. 11 KV Polymer Disc 45 KN :50000 nos. 11 KV Post Insulator 6.6 KN 1000 nos. 33 KV Post Insulator 10 KN : 1000 nos.	86.70 164.00 73.80 110.00 2.00 13.61	2000.00	On <b>09.09.11</b> (at 1430 hrs.)
<b>TOTAL</b>		<b>Rs. 450.11 Lakhs</b>		

**NOTE - (1)** It is not mandatory to quote for all items ; however the bidder should quote for atleast 30% of the quantity of the item or items that he submits his tender for.

**(2)** Separate Price & Quantity Schedules have been kept for each of the six items above and the bidder has to fill only the schedules for the items he offers to supply in his bid

**(3)** In the SCHEDULE- V A 'General Information' at pt. no. 4(a) the bidders should invariably mention the quantity and the items they are quoting for in their bid .

1. The complete tender would be available on website stated above from **26.08.11** onwards.
2. Tender documents can be purchased **only online** from <http://mmkvvc.mpeprocurement.gov.in> by making online payment for the Tender Document Fees.

3. The Bid Data should be filled in and the Bid Seals (Hashes) of all the envelopes and the documents which are to be uploaded by the Bidders should be submitted online upto as per time schedule (Key Dates) given at para 12 here.
  4. The Bidders shall have to submit their Bids **online** (decrypt the bids and re-encrypt the bids) and **upload the relevant documents forms** as per time schedule (Key dates). Original Earnest Money Deposit Instrument of amount Rs. 50,000/- or amount equivalent to the extent of item / qty. quoted should reach the office of the undersigned by 1400 hrs. of 09.09.11. in an envelope alongwith the Hard copy envelope.
  5. Since the online bidders are required to sign their bids online using Class III – **Digital Certificates** only, hence they are advised to obtain the same at the earliest. For further information, Contractors are requested to contact **NexTenders (India) Pvt. Ltd.**, A-6 Sahyog Parisar, E-8 Shahpura, Opp. Maakhan Lal University, Bhopal – 462 039, Tel No. 0755-4075010, Email Address : [bhopal@nextenders.com](mailto:bhopal@nextenders.com)
  6. (Note : It may take upto 4 working days for issue of Digital Certificates)
  7. **Bidders intending to participate in the Tender are required to get themselves trained on the e-Procurement System.** *The Bidders are required to contact the Service Provider - Wipro – NexTenders to confirm their session in advance.*
  8. Tender documents can be purchased *only online* by **1100 hrs. of 05.09.11** and downloaded only online from <http://mpmkvvc.mpeprocurement.gov.in> **upto 1730 hrs of 05.09.11** by making online payment for the Tender Document Fees.
- The EMD of Rs. 50,000/- or amount equivalent to the extent of item / qty. quoted, in favour of Sr. A.O. (HOAU), MPMKVV Co.Ltd. payable at Bhopal, along with HARD COPY of tender & supporting documents duly filled up **excluding the , Price & Quantity schedule(s) and Commercial Deviation Schedule** shall be *dropped* in the tender box of Purchase Section, O/o CMD, Bhopal on or before date 09.09.11 till 1400 hrs.
9. **Bids not accompanied with an acceptable bid security as specified in bidding documents, in a separate cover or bids accompanied with bid security of inadequate value shall be rejected by the procurer and in such cases bids shall be returned to the bidders unopened.**
  10. The corrigendum or addendum to the bidding documents if any will be published on the Company's website [www.madhyavitaran.in](http://www.madhyavitaran.in). *Hence participant bidders are **advised to regularly visit the website** for any amendment to the bidding documents* until the last date of bid submission. This office shall not in any way be responsible for any ignorance of the bidders about the corrigendum or addendum.
  11. Other details can be seen in the tender documents

**12. Key Dates : Single Submission Multi Opening with Prequal**

S.N.	MPMKVVC Stage	Contractor Stage	Start Date & Time	Expiry Date & Time
1	Tender Preparation And Release of NIT		23.08.11 10:30	26.08.11 14:00
2		Tender purchase Online	26.08.11 14:01	05.09.11 11:00
3		Tender Download	26.08.11 14:01	05.09.11 17:30
4		Submit Bid – Hash Online	26.08.11 14:01	06.09.11 17:30
5	Close for Bidding Generation of Super Hash		06.09.11 17:31	07.09.11 17:30
6		Submit bids online _ Re-encryption	07.09.11 17:01	09.09.11 12:00
7	Open EMD & Technical / PQ bid	-	09.09.11 14:30	09.09.11 19:00 Physical i.e. Hard copy (Hard bound) sub. by 1400 hrs of 09.09.11
8	Open Financial/ Price - Bid	-	21.09.11 12:00	21.09.11 16:00

**Note :-** In case if any above date(s) is declared a holiday/local holiday then the date will get shifted to the next working day.

- a) The Company reserves the right to reject any or all the tenders or accept any tender in full or part as considered advantageous to the Company, whether it is lowest or not, without assigning any reason whatsoever it may be.
- b) The tender notice and complete tender and further information – ‘if any’, shall also be available on our website [www.madhyavitaran.nic.in](http://www.madhyavitaran.nic.in). For purpose of the single **Hard Copy** submission and going into the details of Tender only, the tender may be downloaded from this website.

**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**

**OFFICE OF THE CHIEF GENERAL MANAGER (PUR)**  
M.P.MADHYA KSHETRA VIDYUT VITARAN Co. Ltd.,  
NISHTHA PARISAR, BIJLINAGAR, GOVINDPURA, BHOPAL (MP)

Postal Order/Demand Draft No.....

.....

Tender issued to M/s .....

**TENDER FORM**

The undersigned hereby tender and offer (subject to the Company's conditions of tendering) the MP Madhya Kshetra Vidyut Vitaran Co. Ltd., Bhopal to supply the plant, machinery and materials and execute and do the several works and things which are described or referred to in the Details of Technical Particulars attached to tender document no. **CMD/MK/04/226** and its enclosure and in Schedules to the side Details of Technical Particular copies of which are annexed here to and which under the terms thereof are to be supplied, executed and done by the contractor and to perform and observe the provisions and agreements or the part of the contract contained in or reasonable to be referred from the said tender documents for the sums and at the rates sets out in Schedule-I annexed here to.

The questionnaire enclosed with this tender document has been fully answered and is enclosed herewith (if the questionnaire is not answered in full, the answers to various questions may be taken so as to be advantageous to the Company unless contrary is mentioned in the body of the tender).

Signed this ..... Day ..... of .....(month) ..... 2011

TENDERER'S SIGNATURE  
(With Seal)

**ANNEXURE – III****IMPORTANT INSTRUCTIONS TO BIDDER FOR SUBMITTING BID AGAINST TENDER SPECIFICATION  
NO. CMD/MK/04/226**

1. Here are some of the very important instructions which every tenderer should read carefully for compliance before submitting his bid.

2. The Hard copy of the Bid should be submitted in **two** parts as explained below:-

(a) **PART - I:** This part is fulfilling the requirement of deposit towards Earnest Money. The tenderer in this envelope should put either the original money receipt in support of having deposited cash with Sr. A.O.(HOAU), MP MKVV Co. Ltd. Bhopal towards Earnest Money OR the Bank Draft for the purpose OR the photocopy of document exempting this firm from Earnest Money Deposit (which might be his permanent Registration with District Industries centre as SSI Unit of M.P. for the items quoted) *duly attested* by the General Manager of DIC of the area or Photocopy of valid registration certificate issued by NSIC, for small or medium scale unit, as the case may be NSIC certificate if submitted should be re-validated, in case date of issue / last re-validation is more than three years old.)

(b) **PART-II:** - Envelope for this part shall contain Technical and Commercial aspects of the Bid and documents supporting the same excepting the Commercial deviation schedule (which has to be submitted online). ALL THESE DOCUMENTS HAVE MANDATORILY TO BE **HARD BOUND** (BUT THIS HARD BOUND COPY SHOULD BE KEPT IN AN ENVELOPE)

**NOTE :** THE PRICE BID (S) AND COMML. DEVIATION SCHEDULES ARE TO BE **SUBMITTED ONLINE** AND NOT IN HARD COPY; KINDLY NOTE.

3. **Method of submission of bids and their opening:**

(a) **The bidder has to submit the tender online to the MP Govt. designated e procurement agency M/s Nextenders.**

(b) There have to be two envelopes for each Bid as explained above at point No. 2. All the two envelopes shall then be put in **one main envelope**. The main envelope shall be super scribed as under:-

- |       |   |   |        |
|-------|---|---|--------|
| (i)   | "T.S. <b>CMD/MK/04/226</b> DUE FOR OPENING ON 09.09.11  |   |        |
| (ii)  | "THIS ENVELOPE CONTAINS TWO ENVELOPES TOWARDS PART-I AND II OF THE BID"                               |   |        |
| (iii) | "IT IS CERTIFIED THAT WE CATEGORICALLY AGREE TO THE FOLLOWING CLAUSES OF THIS TENDER SPECIFICATION":- |   |        |
|       | (a) PAYMENT TERMS   | : | AGREED |
|       | (b) SECURITY DEPOSIT  | : | AGREED |
|       | (c) PENALTY   | : | AGREED |
|       | (d) PERFORMANCE GUARANTEE   | : | AGREED |

*In absence of above certification on the main envelope itself, the same shall not be opened and the offer might be rejected.*

**Important Note :**

THE PART II CONTAINING GENERAL TECHNICAL & COMMERCIAL SCHEDULES (EXCEPT COMML. DEVIATION SCHEDULE) OF THE TENDER AND SUPPORTING DOCUMENTS THEREOF SHOULD **INVARIABLY BE HARD BOUND, BINDED COPY** SUCH THAT PAPERS THEREIN ARE FIRMLY SECURED & NON REPLACABLE (Please note that spiral bounded copy would **not** be accepted).

In case of any dispute in this regard, the decision of the CGM (Pur) O/o CMD, MPMKVVCL, Bhopal would be final and binding on all parties concerned. But in normal circumstances no relaxation would be allowed for the Hard & secure binding condition for the hard copy of the bid.

(c) Even, after certification on the body of the main envelope, if any ambiguity is found in any part upon opening of the main envelope or even after opening of the subsequent envelopes, the offer shall be rejected.

(d) In addition to the superscription as detailed above on the main envelope, each of the two envelopes towards Part-I, & II are to be super scribed as under:-

“Part-I/II, as the case may be, of Tender Specification No.CMD/MK/04/226 due for opening on 09.09.11”

(e) Upon successful verification of the fulfillment of the requirement of earnest money deposit on opening of envelope of Part-I, second envelope towards Part-II shall be opened on the same day. The Price bid (s) shall be opened ONLINE later on for the tenderers who have fulfilled the eligibility criteria of the tender and whose bid qualifies technically.

(f) The Tenders, hard copy must reach the office of the Chief General Manager(Pur), O/o CMD, M.P. Madhya Kshetra Vidyut Vitran Co. Ltd., Bhopal, Nishtha Parisar, Govindpura, Bhopal-462023 on the date and time as stipulated in the Notice Inviting Tenders. Tenders hard copy if received after the due date & time will not be considered.

(g) IF NEED IS SO FELT AT ANY STAGE OF TENDER BY THIS OFFICE THEN IF SO ASKED, **one sample of each item quoted for by the bidder will have to be submitted by him.** The sample should have a tight adhesive / sticker bearing name of bidder firm (painted name would also be accepted) to identify the supplier. The sample has to be submitted at Area Stores of MPMKVVCL located at Nishtha Parisar, Govindpura, Bhopal.

4. The questionnaire appended in Schedule-IV & Schedule-V (A, B & C) should be very clearly answered without ambiguities.

5. The quoted prices should be **“FIRM”** & FOR Destination basis inclusive ED, VAT/ ST, CST and freight, forwarding, insurance and other levies; Entry tax in respect of the firms located out of M.P. shall be paid directly from the offered price. The prices shall be indicated strictly in the formats for the six type of items appended with this Tender Specification in Schedule-I. The prices quoted in any other manner/format shall not be considered for evaluation of the tender.

6. All the SSI/NSIC Units should quote/offer the quantity *only to the extent they are registered with the SSI/NSIC*. If after opening of the offer, it is noticed that they have offered quantity which is higher than that given in their registration certificate then their offer is **liable to be rejected** and will not be read out. Similarly, inadequate amount of EMD corresponding to the offered value will lead to the rejection of their offers.

7. The Company may not entertain any deviation from the Commercial Terms & Conditions as specified in the Tender Specification and the offers showing deviations are likely to be rejected.

8. Photocopies of the orders/performance reports received from other Electricity Boards/Govt. undertakings etc. should be enclosed (In case no orders are received from MPEB in the past). However, the details of the past experience in respect of supply of tendered items either to MPSEB / Discom of MP or to the other Boards/Utilities have to be given in Schedule-V (A) & in Schedule VI.

9. **Pool Rates:**

The bidders, particularly the SSI Units of the State, are advised to quote their own individual rates. It may please be noted that if the same rate is quoted by more than one bidder, suggestive of a cartel, then such offers may not be considered by the Company. It may also please be noted that the competitive rate quoted by each tenderer may be one of the main criteria for the quantity to be ordered on each successful bidder.

10. **Price Consideration Zone:-**

The offers falling within the range of **1.10** times the lowest acceptable offer will only be considered for counter offer but the offers to be considered (nos.) would totally be at the discretion of this office.

11. **Basic Qualification of Bidders:**

As per clause -2 of Annexure-I enclosed herewith.

12. **Type Tests:-** The bidders are advised to submit ***all the type tests as per relevant IS in force*** and as per schedule-II (A&B) with type tested drawings from CPRI, Bangalore or from any NABL accredited or Govt. standard test laboratory in India or from laboratories of International repute duly attested by "Competent Testing Authority" *along with the tender invariably*. Type tests for the tests conducted on the tendered item/material shall not be older than 5 years on the date of opening of technical commercial bid. If the bidder firm has applied for type test but the result is awaited, same may also be allowed but in the event of order to the firm, the bidder has to produce the type test result(s) within two weeks of the order issue date or otherwise the order would be cancelled. Also copy of application to the Lab(s) as depicted above should invariably be attached while submitting the bid (In the hard copy).

13. The **Security Deposit** shall have to be kept valid till expiry of guarantee period and also till full settlement of recoverable liability, if any.

14. **Negotiations -**

- (a) The firm quoting the lowest in terms of the overall cost of any particular item tendered in the instant tender could be invited for discussions. The aim is to reach agreement on all points especially upon the rates for supply in P.O. In such an event a responsible, authorised official / representative of the firm should visit the CMD (CZ), MPMKVVCL Office Bhopal within three–four days of the request sent to the firm in writing ( which could be through fax / e-mail too).
- (b) Negotiations may include discussion on proposed methodology, work plan, delivery of material to the Company and other related matters. The CGM (Pur) and Director (Fin.) would necessarily be part of the negotiating team. *If company deems it fit, negotiations may also be held regarding financial proposal of the bidders also.*
- (c) If negotiations with the lowest bidder fail, the Company may invite the bidder who has quoted the second lowest amongst all the bidders to negotiate and so on.
15. To enable us quick and easy examination and evaluation of the bids, it is advised to flag and bind following document in your bid hard copy -:
- (a) Photocopies of the orders/performance reports received from other Electricity Boards/ Govt. undertakings etc. ( in case no orders received from MPSEB in the past). However, the details of the past experience in respect of supply of tendered items, either to MPSEB / MP Discoms or to the other Boards/Utilities have to be given in Schedule-V (A).
- (b) The documents should be put in Part-II of the Bid in the following sequence:-
- (i) Tender form in original.
  - (ii) Schedule-III i.e. ***Details of Type Tests carried out on Equipments alongwith copy of Type Tests certificate from Govt. recognized laboratory of National Repute.***
  - (iii) Schedule-VII Source of procurement of raw material alongwith copy of invoices.
  - (iv) Questionnaire duly answered (Schedule-IV Part-A, B & C).
  - (v) Schedule-VI(Part A): (towards Performance & Past Experience..
  - (vi) Schedule-VI (Part-C) : towards Technical Deviations.
  - (vii) Schedule-II, (C), (D) & Schedule-III, (C), (D) [Technical Specification & Guaranteed Technical Particulars].
  - (viii) Certificates towards capacity, Sales Tax Clearance, Income tax clearance or towards exemption of Sales tax or Excise Duty.
  - (ix) Printed literatures towards technical specification etc.
  - (x) Any other documents required as per the tender.
16. IF NEED IS SO FELT AT ANY STAGE OF TENDER BY THIS OFFICE, THEN ,IF ASKED, ***one sample each of the item the bidder quotes for has to be submitted (with proper identification of bidder firm on it and T.S. No.) to the AGM Area Stores MPMKVVCL, Govindpura, Bhopal.***

(SANJEEV P. PURANIK)  
CHIEF GENERAL MANAGER (PUR)  
O/o CMD, MP MKVV CO.LTD., BHOPAL

P A R T - II  
A N N E X U R E - I

**GENERAL INSTRUCTIONS TO TENDERERS**

**1. General**

The Chief General Manager (Pur) on behalf of 'The Madhya Pradesh Madhya Kshetra Vidyut Vitaran Co. Ltd.' Bhopal herein-after referred to as 'Company', will receive **bids** ONLINE for supply of materials/equipments in accordance with the attached specifications for supply to Area Stores of MPMKVVCL located at **Bhopal, Gwalior and Guna** only in Madhya Pradesh.

**2. Basic Qualification of Bidders**

A. This bidding is open for **manufacturers** only of Polymer or Porcelain or both type of Insulators, who provide satisfactory evidence:-

- (a) That they are qualified Manufacturers who regularly manufacture the materials/equipments of the type specified and have adequate technical knowledge and practical experience.
- (b) That they do not anticipate change in the ownership during the proposed period of contract (if such a change is anticipated, the scope and effect thereof shall be defined).
- (c) That, they have adequate financial stability and status to meet the financial obligations pursuant to the scope of the assignments (The tenderer should submit atleast two copies of their Profit & Loss Account and Balance Sheet for the last two years including turn-over).
- (d) That, they have adequate plant and manufacturing capacity available to perform the assignment properly and expeditiously within the time period specified. The evidence shall consist of written details of the installed manufacturing capacities and present commitments (excluding the assignment under this specification) of the Bidder or his Principal. If the present commitments are that the installed capacity results in inadequacy of the manufacturing capacities to meet the requirement of equipment/material corresponding to this bid, then the details of alternative arrangements to be organised by the Bidder for this purpose shall also be furnished.
- (e) That, they have established quality assurance systems and organizations designed to achieve high level of quality equipment and reliability during his manufacturing activities.

*B. As the **Polymer (Silicon) composite Insulators suitable for T&C type hardware** are a newly developed insulating materials, hence the manufacturers are limited at present. ,Therefore for Polymer (silicon) composite Insulators in addition to "A" above the bidder who is not the original manufacturer for Polymer but only **original manufacturer of Porcelain Insulators** ,but is having MOU or business deed with the manufacturer of Polymer Insulator shall also be considered eligible to participate (proof of MOU or business deed necessary) for the polymer items too.. Similarly if some manufacturer is manufacturing only Polymer type Insulators and is not the*

original manufacturer for 11 KV & 33 KV (Porcelain) Post Insulators but has an MOU or Business deed with the manufacturer of such Porcelain Post Insulators, then he would be eligible to participate for the porcelain items too *provided he furnishes proof of the MOU or Business deed.*

### 3. Earnest Money

(i) The tenderer shall deposit the Earnest Money amount vis-à-vis the value of the materials offered as shown here under:-

(ii)

Value of Material	Earnest Money
Upto Rs. 50,000/-	Nil
Above Rs. 50,000/- & upto Rs. 2.5 Lakh	@ 1%
Above Rs. 2.5 Lac & upto Rs. 3.0 Lakh	Rs. 2,500.00
Above Rs. 3.0 Lakh & upto Rs. 7.0 Lakh	Rs. 5,000.00
Above Rs. 7.0 Lakh & upto Rs. 15.0 Lakh	Rs. 7,000.00
Above Rs. 15.0 Lakh & upto Rs.25.0 Lakh	Rs.10,000.00
Above Rs. 25.0 Lakh & upto Rs.35.0 Lakh	Rs.15,000.00
Above Rs. 35.0 Lakh & upto Rs. 50.0 Lakh	Rs.20,000.00
Above Rs. 50.0 Lakh & upto Rs.75.0 Lakh	Rs.30,000.00
Above Rs.75.0 Lakh & upto Rs.100.0 Lakh	Rs.40,000.00
Above Rs. 100.0 Lakhs	Rs.50,000.00

(iii) The tenderers are permitted **to quote for part quantities** but not less than **30%** of the quantity tendered for each of the item or items that they quote for. **It is not mandatory to quote for all items tendered and** the bidder may pay earnest money only to the extent of his participation on the basis of slabs specified above. Calculation for EMD amount to be submitted should be done as per value of individual item given in Tender Notice of the Tender. If the earnest money amount is found to be less than required for corresponding value of the material offered, the offer may be rejected and will not be read out.

(iv) The Earnest Money can be deposited in one of the following forms only:

- a) *In cash*: - to be deposited with the Senior Accounts Officer(H.O.A.U.), MPMKVV Co. Ltd, Bhopal.
- b) *By Bank Draft* in favour of **Senior Accounts Officer(H.O.A.U.)**, MPMKVV Co. Ltd, payable at Bhopal.

**No offer will be accepted without valid Earnest Money Deposit, unless exempted by the Company.**

(v) The following are exempted from payment of Earnest Money Deposit :-

- a) S.S.I. Units of Madhya Pradesh Permanently registered with DIC. *The registration should be permanent and should be specifically for the items quoted in the tender and valid on the date of opening of tender.*
  - b) **Small Scale Units registered with NSIC:-** The Small Scale Unit permanently registered with NSIC, whose registration certificate is valid for the item quoted on due date of opening of commercial and technical bid shall be entitled for exemption from EMD. (The renewal/ amendment of certificate should not be more than 3 years old from the due date of opening of tender) otherwise EMD has to be furnished by the tenderer.
  - c) The Medium/Large Scale Manufacturing Units, located in Madhya Pradesh (other than SSI and Govt. undertakings) are permitted to furnish the EMD @ 50% (Half) of the rates prescribed above. Here also permanent registration is a must in respect of specified item against this tender.
  - d) Fully owned State/Central Govt. manufacturing Units, (if 100% shares are held by the respective Govt.) for which documentary evidence must be furnished with the offer.
  - e) The photocopy of the NSIC/SSI Registration Certificate for the tendered items duly notarized/ attested by G.M./ Manager, DIC of the Area/ any officer of Company not below the rank of E.E. shall be furnished with the offer. In case of unattested/un-notarized copy, the original certificate should be produced at the time of tender opening for verification.
- (vi) All the SSI/ NSIC units should quote/offer the material only to the extent they are registered for respective items with the SSI/NSIC organization.
- (vii) **In case, the tenderer withdraws his offer during the validity period, after placement of order, the EMD amount shall be forfeited.**
- (viii) **Return of Earnest Money to Bidders**
- a) EMD shall be returned to the un-successful bidders, as soon as possible, after the tender is decided. No interest shall be paid on EMD amounts.
  - b) EMD of bidders on whom the orders have been placed, shall be returned on acceptance of security deposit. No, interest shall be paid on EMD amount.

#### **4. Taxes and Duties**

- a) All taxes and duties should be included in the prices quoted. Any kind of taxes and duties shall not be paid extra. However, the break up of taxes & duties must be indicated separately in the Schedule-IV, Part-B Commercial Information.
- b) M.P. Madhya Kshetra Vidyut Vitaran Company Ltd., Bhopal is a Registered Dealer and TIN Number is 23263605361. Therefore necessary declaration form, wherever applicable, shall be issued after receipt of material at destination, by the M.P. Madhya Kshetra Vidyut Vitaran Company Ltd., Bhopal. Any other applicable declaration form for concessional rate of Sales tax/Commercial tax as may be in force shall be given only after the legal position is verified at our end. Please note that 'C' forms for claiming concessional sales tax shall not be issued in case of following items:-

- (i) Typewriters,
  - (ii) Stationery,
  - (iii) Furniture &
  - (iv) Other goods not used in the process of Generation/Transmission/ Distribution of Electricity Energy.
- c) Excise duty and Sales Tax/Commercial Tax/VAT are payable for the contractual delivery period only at the prevailing rates wherever applicable. No upward variation shall be payable beyond the contractual delivery period, where the supplier is responsible for the delays.

Wherever applicable tenderers outside the State of M.P. should also quote the prevailing rate of Sales Tax/ Commercial Tax in the state of origin so that the concessional rate of CST payable against "C" form may be limited to the Sales Tax applicable for state of origin, from where the material moves, in case, these are lower than the concessional rate of CST. Entry tax shall be paid directly from the offered prices.

#### **5. Binding of Bid**

The Hard copy of the Bid should invariably be submitted in a **secure, hard cover, binding, Spiral Binding would not be admissible**. The Binding should be such that no paper inside remains loose and no page can be detached / replaced. THIS IS VERY IMPORTANT AND **BINDING IS MANDATORY** .

#### **6. Lumpsum based bids**

In case prices for some items or all items are given as a lump sum, instead of unit prices as required in the tender specifications, Company may summarily reject such incomplete tender.

#### **7. Printed Terms and Conditions in bids**

Supplier's printed terms and conditions will not be considered as forming part of the tender under any circumstances whatsoever.

#### **8. Alterations/Corrections In Bids**

Any alteration/correction in the tender document should be counter-signed (in case of documents being submitted in physical form). Further, no post tender alteration/correction shall be entertained.

#### **9. Incomplete bids**

Tender which is incomplete or obscure is liable for rejection.

#### **10. Acceptance of part/whole Bids-rights thereof**

Company reserves the right to accept/ reject wholly or partly any tender without assigning any reason whatsoever. The Company in this regard shall not entertain any correspondence.

#### **12. Ambiguities In conditions of Bids**

In case of ambiguous or self-contradictory terms/ conditions mentioned in the bid, interpretation as may be advantageous to the Company shall be taken without any reference to the tender.

**13. Disqualification of Bids**

A Bid whose hard copy (envelope) gets opened before the due date as a result of improper or no indication having been given on the cover to indicate that it is a tender, will be disqualified.

Tenderers will not be permitted to change the substance of his tender on post interpretation/improper understanding grounds. This includes post tender price changes/modifications etc. after opening of Price bid (s). In such events, otherwise, that is, when a tenderer does not comply, tender will be rejected.

**14. Language of Bids**

All tenders should be made either in English or in Hindi only.

**15. Income Tax/Sales Tax clearance Certificate**

The tenderer shall furnish Income Tax/Sales Tax clearance certificates from competent authority. Alternatively, the tenderer shall give reasons for his inability to furnish such a clearance certificate. The Company reserves the right to reject any tender if Income Tax & Sales Tax clearance certificates or the reason for the tenderer's inability to furnish such a certificate are not furnished.

**16. Filling of Questionnaire/Schedules**

All the Questionnaire / Schedules along with specification are enclosed for technical/commercial terms & conditions. It is compulsory on the part of the bidder to furnish all details as sought in these. In case, these are not filled in and enclosed with the offer, the Bid will be rejected.

**17. Deviations from Terms & Conditions**

Offers with deviations in the terms of payment, liquidated damages, security deposit and performance guarantee are liable to be rejected out rightly.

Should the tenderer desire to depart from other conditions and/or technical specifications in any respect, he shall draw attention to such deviations as per Schedule-V Part "B" and "C" stating fully the reasons thereof. Unless this is done, these conditions and specified specifications will hold good, as acceptable to the tenderer.

**18. Past Experience**

Supplier having past experience in manufacture and supply of materials should furnish the list of supplies made during the last three years for the materials supplied by them, as per enclosed Schedule-V Part "A" failing which the tender may not get any preference for his past experience.

**19. Submission of Bids**

- (i) **The tender hard copy shall be submitted in two (2) parts:-**  
**Part-I shall contain "EARNEST MONEY DEPOSIT/DOCUMENT WHICH ENTITLE FOR EXEMPTION FROM EMD".**

**Part-II** shall contain "**COMMERCIAL BID AND THE TECHNICAL BID**".

The Price bid (s) is to be submitted **ONLINE**.

- (ii) Tender submitted on behalf of companies registered with the Indian Companies Act, for the time being in force, shall be digitally signed by a person duly authorized to submit the Tender 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 Tender on behalf of the Company.
- (iii) **The two parts of the hard copy of the bid, shall be submitted in two separate sealed envelopes and these envelopes shall be properly superscribed as Part-I "Earnest Money Deposit", Part-II "Commercial Bid and Technical Bid"**. Each envelope shall also be superscribed with *name of item and T.S. No.* for which the tender is submitted, the name of the said tenderer and the date of opening, as advertised.

The hard copy of the Bid shall be submitted in one copy only. BUT SHOULD BE HARD BUND and contained in Envelope (Part II). The Envelope should be thick enough to bear the document load and should not tear in normal handling.

## **20. Date and time of opening of bids - changes**

Tender shall be opened online on the due date and time as notified in the presence of the tenderers or their authorized representatives who may choose to be present. If the due date of opening/ submission of tender documents are declared a holiday by the Central/ State Government or Local Administration, it will automatically get shifted to the next working day, for which no prior intimation shall be given. The tender opening shall be continued on subsequent days, in case the opening of all the tenders is not completed on the day of opening.

It may please be noted that the due date/ time of opening can be altered, extended, if felt necessary by the purchaser, without assigning any reason thereof. However, due intimation shall be communicated in such a case.

## **21. Opening of E.M.D. & Commercial and Technical bid**

The first envelope of Earnest Money Deposit shall be opened on the due date and time, as notified in the Notice Inviting Tenders. **The concerned Company Official receiving the tenders or his duly authorised Officer shall first open the Earnest Money Deposit envelope of all the Bidders and verify the Earnest Money Deposit or EMD exemption document submitted (in the Part – I envelope). He shall check for the validity of Earnest Money Deposit as required. In case, the requirements are incomplete, the bid will be declared invalid.**

The requirement for EMD shall be verified and thereafter, the second part, i.e. the Commercial & Technical Bid submitted online by the Bidders shall be **opened online** on the same date in respect of eligible tenderers.

## 22. Opening of Price Bid (S)

### Opening of Price bid (s) on subsequent date:-

- (a) After opening of first two parts (i.e. Part-I and Part-II), the deviations from the Company's terms & conditions, if any, proposed by the tenderer in regard to Commercial and technical Bid, as per prescribed schedules, given along with the tender documents, shall be notified and clarifications, if required by Company, shall be submitted by the tenderers, either at the time of scrutiny of tender or within the time prescribed. **Any deviations from payment terms, penalty, security deposit and performance guarantee clauses of tender specification shall not be acceptable, in any case and the offer shall be liable for rejection out-rightly.**
- (b) The bidder shall have no scope to change their Price bid (s). In case deviations and clarification on Commercial and Technical matters are not submitted by the tenderer within the time prescribed by the Company then the Company reserves the right to refuse to reject the bid and thus, the tenderer should ensure that their tender is strictly in conformity with the specifications.
- (c) *The Price bid (s) would be opened ONLINE only and the bidders whose bid has technically & Commercially qualified would only be eligible for Price bid (s) opening.*

The decision of the Company in this respect shall be final and acceptable to the tenderer.

## 23. Canvassing of Bids

Tenders shall be deemed to be under consideration, after opening of tender/ bid, till placement of order. During this period, the tenderers or their authorized representatives or other interested parties **are advised strongly, in their own interest, to refrain from contacting** by any means any of the Company's personnel or Representative, on matters relating to tender under process.

## 24. Validity of Bids

The offers shall be **valid for 180 days**. Validity of the offer shall be counted from the date of opening of bids. Those who do not agree for a validity of 180 days will do so at their own risk and their offers are liable to be rejected.

## 25. Authorisation/Local Representative

Only authorized representative, possessing necessary authority letter from the tenderer who have participated in the tender shall be allowed to attend the tender opening.

**26. Acceptance of Tender**

- (i) The Company may reject any or all tenders or to accept any tender considering advantageous to Company whether it is the lowest offer or not.
- (ii) *The Company may split the quantities against the tender on more than one tenderer for the same item. The Company shall assign no reasons for this and the same will be binding on the tenderers.*

**27. Change of Quantity**

The quantity indicated the Schedule-I is tentative and purchaser reserves the right to vary the quantities of any or all items as specified in the technical specification/schedules as may be necessary, based on Purchaser's judgment and vendor rating (wherever carried out). No correspondence shall be entered into, neither discussed regarding quantity variation, nor any reason will be assigned thereof.

**28. Pool Rates**

The tenderers are advised to quote their own individual rates. It may please be noted that if more than one tenderer quotes the same rate, suggestive of a cartel, then such offers may not be considered by the Company. It may also please be noted that the competitive rate quoted by each tenderer may be one of the main criteria for quantity to be ordered on each successful tenderers.

**29. Blacklisting of firm -:**

Bidders may please note that in the event of violation of any of the terms and conditions of this tender or the terms and conditions of the subsequent supply order / work contract so issued, either partly or completely, (then) in such event the MPMKVVCL Co. reserves every right to take penal actions which may *inter alia* include **termination of the contract and / or blacklisting and debarring the tenderer** from participating in future tender/tenders for stated number/numbers of year along with the other penalties as stated in the tender document. Before debarring / blacklisting or contract termination, the concerned firm would be first served a notice to the effect, so that it gets an opportunity to represent it's point of view.

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**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**

**ANNEXURE-II****GENERAL TERMS AND CONDITIONS OF PURCHASE****1. PRICES AND STATUTORY LEVIES:-**

(a) The price of all insulators indicated in price schedule shall be FIRM 'FOR' Destination inclusive of ED, VAT, ST/ CST and all other levies & taxes.

(b) The prices shall be quoted exactly as per the price schedule-I enclosed with the tender specification, including all elements. In absence of this, the offer shall be liable for rejection.

(c) The prices may be quoted for all or selectively.

**2. PRICE CONSIDERATION ZONE:-**

The bidders are requested to quote most competitive prices, as the prices falling beyond the range of 1.10 times the lowest acceptable offer shall be rejected for counter offer.

**3. PACKING AND FORWARDING:-**

(a) The supplier shall be responsible for the Stores being sufficiently and properly packed at his expenses for transport by rail, road or sea, so as to ensure them being free from the loss/damage due to handling and transport to the destination.

(b) Each package shall be prominently and distinctly marked on atleast two faces, indicating the full address of the consignee, destination station, name of equipment, purchaser's order number, weight and volume of the package etc.

(c) Each package shall contain in a water proof cover, a detailed description indicating the order reference and date and list of the contents. Each item contained in the package or box shall be described sufficiently, to enable easy identification. The quantity, weights etc. shall also be given.

(d) The packaging shall conform to the specification, rules and regulation prescribed by the Underwriters, Railways, and Transport Agencies. In case of any loss/damages to the consignment, due to non-standard packing the same shall be made good, free of all charges to Purchaser by the supplier. All the provision of this clause shall apply whether the disrupting cause is total or partial in its effects upon the ability of the supplier to perform.

**4. MODE OF DISPATCH:-**

The tenderer should clearly indicate mode of dispatch for the material. In case of dispatch through rail, the material is to be booked for respective destination railway station. In case of dispatch through road transport, the material should be dispatched through bank approved road transporter on door delivery basis only.

**5. TRANSIT RISK:-**

(a) **Responsibility regarding covering of risk during transit of material shall entirely be on the supplier.** The Company shall, in any case, not bear the transit risks/transit insurance charges.

(b) Transit damages/shortages/losses shall be reported by the consignees within 30 days from the receipt of the consignments. Such damages/shortages/losses shall be repaired/replaced by the suppliers, free of cost within one month from the date of intimation by the consignee without waiting for his settlement from carrier or Insurance Company etc. If the supplier fails to do so the consignee (s) shall be free to get the repair work done from other sources and they shall be free to recover the cost of such material/expenses of repairs either from the supplier/balance bills or from the security deposit as deemed fit.

(c) While the necessary assistance shall be rendered by the consignee in lodging and processing the claims with carriers and the supplier's insurance underwriters, the responsibility shall rest with the supplier to immediately make good the shortages/losses/ damages, without any extra cost and without waiting for the settlement of the claim.

(d) **Replacement of goods lost/broken or damaged including loss due to fire:-**

Notwithstanding anything here-in contained, the supplier shall undertake responsibility for the safe arrival of the material in good condition and without any loss or damage at the final destination and until the same is actually delivered to/received by the Company at its stores or other places of final destination. For this purpose, material carried by Railway or Road transport or other carriers *shall be deemed to be so carried at the risk of the suppliers.* In the case of transport damages/shortage, the payment shall be made **only for the quantity received in good and working condition** and consignee shall lodge claim with the suppliers/carrier with all necessary documents for settlements of the same with the carriers at supplier's end.

5. **DELIVERY:-**

(i) **15%** of the quantity ordered shall be supplied **within two months** from the date of receipt of order which will be presumed as seven days from the order issue date (for postal transit) and to be completed within **four equal monthly installments** thereafter. *However earlier deliveries would be preferred and would be welcome.*

(ii) Any delay in delivery beyond this period shall attract penalty even though offer for pre-delivery inspection is made timely within the terminal date of delivery.

(iii) The material should be delivered to the consignees within 15 days from the date of issue of despatch instructions/clearances. Any delay in delivery beyond this period shall attract penalty even though offer for pre-delivery inspection is made timely within the terminal date of delivery.

(iv) **Deferment of deliveries:-**

**Company reserves the right to defer or reschedule the delivery.** *Deferment of delivery may extend to several months.*

**7. FORCE MAJEURE:-**

Force majeure condition is herein defined as:-

- (a) Natural phenomena, such as floods, draught, earth-quake and epidemics.
- (b) Act of any Government Authority, domestic or foreign, such as war, quarantines, embargoes, licensing control or production or distribution restrictions.
- (c) Accident and disruption such as fires, explosion, and increase in power cut with respect to date of tender opening, break-down of essential machinery or equipment etc.
- (d) Strikes, slow down, lockout continuing for more than three (3) weeks.
- (e) Failure or delay in the supplier's source of supply due to force majeure causes enumerated at (a) do (d) above, provided the supplier produces documentary evidence to show that there were no other alternative sources of supply available to him or if available, the lead time required was likely to be longer than the duration of the force Majeure at the normal source of supply.
- (f) Any cause which is beyond the reasonable control of the supplier or purchaser as the cause may be.

All the provisions of this clause shall apply whether the disruption cause is total or partial in its effect upon the ability of the supplier to perform.

**Note:-** In case of much delay, the cause of force majeure condition will be taken into consideration only if the supplier *within 15 days from the day of occurrence* of such delay notifies. The company shall verify the facts and grant such extension as the facts justify. For extension due to force majeure conditions, the supplier shall submit his representation with documentary evidence for scrutiny by the purchaser and decision of the Company shall be binding on the firm.

**8. TERMS OF PAYMENT:-**

- 8.1 Subject to completion of all contractual formalities, 100% payment alongwith excise duty and taxes corresponding to the consignment would be made within 45 days from the date of receipt of material at consignee in good condition against **MATERIAL RECEIPT CERTIFICATE (MRC)** issued by the consignee at the places given in Annexure-IV.
- 8.2 The supplier shall forward the original RR/MTR and Excise gate pass directly to consignee alongwith copies of following documents:-
  - (i) A copy of bill
  - (ii) Delivery challan
  - (iii) Original copy of excise duty gate passes alongwith a photo copy.
  - (iv) The inspection and/or T.C. approval.
  - (v) Detailed packing list.

- 8.3 The original bills in triplicate should be forwarded to the paying authority and should be marked "**ORIGINAL**". The bill should indicate Sales Tax Registration Number and date allotted to him under Sales Tax Act.
- 8.4 The following documents will have to be forwarded to the paying authority alongwith bills in triplicate:-
- i) Bill/Invoice.
  - ii) Original copies of excise duty gate pass along with one photocopy.
  - iii) The inspection and /or T.C. approval.
  - iv) Xerox copy of dispatch documents, i.e. RR/MTR etc.
- 8.5 The material Receipt Certificate will be forwarded by the consignee to the paying authority for payment, as well as to the supplier towards acknowledgement of receipt of material including part consignment to the extent it is received in good condition and is serviceable.
- 8.6 The bills valuing up to Rs. 2.50 lakhs should be submitted to the concerned Sr. AO/RAO, MPMKVCL. In case bill value is more than the above amount, the bill should be submitted to the Addl Dir.(F&A), MPMKV Co. Ltd., Bhopal for making payment.

9. **PENALTY:-**

(a) The time for and the date of delivery of the material stipulated in the order shall be deemed to be the essence of the contract. In case of delay in execution or non-execution of the order, the Company as its option shall either:

- (i) recover from the supplier/contractor as agreed towards liquidate damages as sum of **½% (half percent) of the price of any stores not delivered per week** or part there of subject to a maximum of **10 % (ten percent)** of the price of any stores not delivered.

**OR**

- (ii) Purchase from elsewhere on account and at the risk and responsibility of the supplier, the stores not delivered or others or similar description.

**OR**

- (iii) Cancel the contract for part or whole of the quantity on order, with liability.

(b) "For the purpose of calculating penalty, the *date of receipt of offer of material in the office* of CMD, MP Madhya Kshetra Vidyut Vitaran Co. Ltd., Bhopal shall be considered as the date of delivery subject to the condition that the offer has been received 15 days in advance of terminal date of scheduled delivery period and material delivered at stores within 15 days of despatch clearances. For early inspection, offer may be sent by e mail or fax. The Company will not be responsible for any delays for ordinary/registered post inspection offers. Please note, in case material is not received within 15 days from the date of issue of despatch instructions, even though the delivery period exists, penalty shall be applicable on delay of despatch.

## **10. PERFORMANCE GUARANTEE:-**

10.1 If during the course of 18 months subsequent to the date of receipt of consignment or 12 months from the date of successful installation and commissioning, whichever is earlier, any of the goods are found to be defective in materials or workmanship or develop defects during service, they will have to be replaced by the supplier, free of all charges. All necessary arrangement on these accounts will have to be made by the suppliers.

10.2 The said material if required to be replaced, shall be collected by the supplier/firm from Area Stores site at their own cost and at their own responsibility. These materials will like-wise be returned duly repaired/replaced and tested subsequently by the supplier to the destination indicated on "Freight paid basis" at their cost in a **reasonable time** of 90 days from the date of intimation from stores. If the firm fails to return duly repaired and tested equipments within this period to respective stores, then penalty shall be imposed @ 10% of the ordered value of defective materials per month. The penalty shall be deducted from the pending bills or security deposit. The guarantee period as stipulated in clause 10.1 above shall also be applicable for repaired/replaced material, which shall however be counted afresh from the date of its delivery at our stores/at site.

10.3 Further, it is clarified that all the charges towards carrying out repairs including packing/forwarding loading/unloading shall be borne by the supplier. The amount deposited under security deposit clause shall also cover the performance guarantee of the replaced material.

10.4 To and fro transportation cost of such failed equipment shall also be borne by the supplier/contractor.

10.5 In the event of the supplier's inability to adhere to the aforesaid provisions, suitable penal action will be taken against them which may result in black-listing of the firm for future business with the Company for a certain period or altogether.

## **11. SECURITY DEPOSIT:-**

11.1 On acceptance of offer, the supplier will have to deposit **an amount of 10% of the total value of the order** in Cash or Demand Draft or Bank Guarantee as Security Deposit.

11.2 Cash has to be deposited with Sr.Accounts Officer(H.O.A.U.), MPMKVCL, Bhopal, and original receipt shall be produced to this office which shall be returned after conveying the acceptance of Security Deposit.

11.3 Demand Draft is to be drawn in favour of Sr.Accounts Officer(H.O.A.U.), MPMKVCL, Bhopal drawn on any nationalized/scheduled Bank and payable at Bhopal.

11.4 Bank Guarantee in lieu of cash deposit must be of any nationalized/scheduled Bank is to be submitted strictly as per Company proforma (to be supplied alongwith the order) valid sufficiently to cover the guarantee period in the office of the CMD, MPMKV Co. Ltd, Bhopal.

11.5 The Security Deposit shall have to be deposited **within 30 days** of issue of order.

- 11.6 The company shall forfeit the Security Deposit in the event of non execution/part execution of the orders/poor performance of supplier/contractors besides invoking of the penalty clauses.
- 11.7 The Security Deposit shall be returned to the successful bidder only after due and faithful performance of the order as per terms and conditions of the order and on expiry of guarantee period, provided there are no claims outstanding to be recovered against the bidders/suppliers.
- 11.8 No interest shall be paid by the Company on security deposit furnished by the suppliers.

12. **EXTENSION ORDER:-**

The Company reserves right to place an extension order for any additional quantity to the extent of 50% quantity of the original order on the same rates, terms and conditions within 6 months from the date of order(s).

13. **TESTING FACILITY AND TESTS TO BE CONDUCTED:-**

The tenderer must give their production capacity, all about testing lab and testing facilities available with them in details for the tendered material. The tenderer should also give the details of test proposed to be conducted in their labs in the event of order with the details Indian Standard Specification/Codes.

14. **MATERIAL TEST CERTIFICATE:-**

Each item of the lot should be tested by the supplier and routine test certificate in duplicate giving the results of all tests prescribed in the relevant ISS (as mentioned in the Technical Specification Schedule) for ordered item shall be submitted to the office of the CMD, MPMKVV Co. Ltd, Nishta Parisar, Govindpura, Bhopal, for approval alongwith the letter/offer for inspection of material. Please note that each lot will be inspected at your works, which includes witnessing of all tests prescribed in ISS.

15. TESTS:-

i).The Porcelain insulators shall comply with the following tests as per IS:731-1971.

ii). **The polymer (silicon) composite insulator shall comply IEC-61109/1992, IEC-60060-1/1989**

15.1. **TYPE TESTS:** - The following constitute the type tests:-

- a. Visual examination
- b. Verification of dimensions
- c. Visible discharge test
- d. Impulse voltage withstand test/Lightning Impulse
- e. Dry power frequency voltage withstand test
- e. Wet power frequency withstand voltage test

- f. Temperature cycle test
- g. Electro-Mechanical failing load test
- h. Puncture test
- i. Porosity test
- j. Galvanizing test.

Test certificate from recognized Govt. Lab. giving the result of type tests, made on not less than two insulators identical in all essential details with those to be supplied as per IS:731/1971, IEC-61109/1992, IEC-60060-1/1989 should be enclosed with the tender.

15.2. **ROUTINE TESTS:** - The following shall be carried out as the routine test:-

- a. Visual examination
- b. Electrical Routine tests
- c. Mechanical Routine tests.

15.3. **ACCEPTANCE TESTS:-**

Acceptance of samples after having withstood the routine tests shall be subjected to the following acceptance tests wherever applicable in the order indicated below :-

- a. Verification of dimensions
- b. Temperature cycle test
- c. Electro Mechanical failing load test
- d. Puncture test
- e. Porosity test
- f. Galvanizing test

15.4. Tolerance in insulator dimensions shall be as per the relevant Indian Standard.

**Acceptance & Routine Tests:**

All routine tests as stipulated in the relevant standards shall be carried out and routine tests certificates shall be submitted before inspection.

16. **DRAWING & CATALOGUE**:- General arrangement drawing, dimensional drawing & design details shall be submitted by the tenderer with their offer. These design parameters shall be considered acceptable if no change is felt necessary.

17. **INSPECTION AND TEST CERTIFICATE**:-

(i) Each lot of offered material shall be inspected by one or two inspecting officers of the Company or by a third party officer authorized by MPMKVCL before despatch. The supplier shall extend all reasonable and necessary help to the inspecting officer of the company or third party to carry out testing of material at his works.

(ii) An intimation about the date, by which material shall be ready for inspection, indicating quantity, shall be given to the CGM. (Pur), O/o CMD MPMKV Co. Ltd., Bhopal, by the supplier, *so as to reach him sufficiently in advance*, at least about 15 days prior to expiry of delivery

schedule, failing which, the suppliers shall be responsible for delay in delivery and levy of penalty. On receipt of such intimation, the material shall be inspected normally within 15 days.

(iii) The supplier shall not despatch the material unless specific despatch instructions are issued by the Purchase Section of the Company.

(iv) In case the inspecting officer deputed for inspection does not find the offered lot ready, the Company reserves the right to recover from the supplier, such charges as may have been incurred towards arranging such inspection. These charges have been mentioned in Clause-16 hereunder.

18. **FAKE INSPECTION CALL:-** All such firms who after giving inspection call do not offer materials to Inspecting officer for inspection due to one or other reasons, shall be required to remit a sum of Rs. 5,000/- per officer.

19. **RIGHT TO CARRY OUT INSPECTION DURING MANUFACTURING:-**

(i) The Company at its option will inspect the material on order during its process of manufacturing including the inspection of raw material and will request the supplier to carry out such tests as may be necessary to ensure proper quality check. Samples of components of the material shall be subject to quality check by the inspecting officer during manufacturing. In the event of stage inspection, if any discrepancy is noticed, the supplier shall be given immediate notice to suspend further manufacturing until corrective measure are taken and the process cleared.

(ii) **Factory Inspection:-**

(a) The factory inspection of the tenderers who have not executed any order of MPSEB shall be carried out before placing detailed order.

(b) During pendency of the order, the factory inspection may be conducted by Company's authorized officers, as and when felt necessary, for ensuring production of quality material.

(iii) The supplier shall extend all reasonable and necessary assistance to the inspecting officer of the Company to carry out testing of equipment/material, at his works.

20. **RECOVERIES FOR LIABILITIES AGAINST OTHER CONTRACTS:-**

All amounts recoverable from the successful bidder against earlier contracts with the Board will be adjusted from payment due against the contract that may be awarded under this specification.

21. **ROYALTIES AND PETENTS:-**

All royalties for patent or any charges for usage or infringement there of that may be involved in the supply shall be included in the offered price and the supplier shall protect purchaser against any claim thereof. Supplier is fully responsible for such contractual dealing and purchaser shall not be called upon to bear any such charges.

22. **COMPLIANCE OF REGULATIONS:-**

The supplier shall warranty that all goods covered under procurement, shall have been produced, sold, dispatched, delivered, tested, in strict compliance with all applicable Rules, Regulation including Industrial (Development and Regulation) Act 1951 and any amendment there under. Labour agreement, working conditions and technical codes and requirements, as applicable from time to time.

The supplier should execute and deliver such documents, as may be needed, by the purchaser in evidence of compliance. All laws, Rules and Regulation are required to be incorporated in this reference. Any liability arising out of contravention of any of the laws shall be the sole responsibility of the vendor and the purchasers shall not be responsible in any manner whatsoever.

### **23. CANCELLATION OF ORDER:-**

23.1. The Company may upon written notice of default, terminate contract in the circumstances detailed hereunder:-

- a) If in the opinion of the MPMKVVCL, the supplier fails to deliver the material within the time specified or during the period for which extension has been granted by the Company.
- b) If in the option of the Company, the supplier fails to comply with any of the other provisions of this contract or material is found not in accordance with prescribed specifications and or the approved samples.
- c) If as a result of stage inspection, it is revealed that material and/or, workmanship is sub-standard which is likely to affect the performance of the finished products a notice would be served by the Board to the supplier to suspend further activities and to take urgent steps towards corrective measures, failing which the **entire order would be cancelled.**

23.2. In the event of such termination, the Company shall exercise the discretionary powers as:-

- (a) To recover from the supplier then agreed liquidated damages as approved in the clause No. 9 above.

**OR**

- (b) To purchase from elsewhere after giving due notices to the supplier on account and at the risk of the contractor such stores/material not so delivered or others of similar description in respect of consignment not yet delivered.

**OR**

- (c) To cancel the contract reserving Company's right to recover damages.

23.3 Notwithstanding that the powers under clause [23.1 (a), (b) & (c)] referred to above, are in addition to the rights and remedy available to the MPMKVVCL under the law of India relating to contract.

23.4 In the event of risk purchase of stores of similar description, the opinion of the Company shall be final. In the event of action taken under the clause 23.1 (a) or (b) above, the supplier shall be liable to pay for any loss, which the company may sustain on that account but the supplier shall not be entitled to any saving all such purchases made against the default.

23.5 The decision of the Company shall be final regarding the acceptability of the store supplied by supplier and the Company shall not be required to give any reason in writing or otherwise at any time for the rejection of the stores/material.

23.6 In the event, the Company does not terminate the order as provided in clause 23.1 and 23.2(c) above, the supplier shall continue execution of this order, in which case he shall be liable to the Company for liquidated detail damages for the delay as per clause 9, until supplies are accepted.

24. **ARBITRATION:-**

If, at any time, any question, or difference. Whatsoever shall arise between the purchaser and the supplier, upon, or in relation to or in connection with the contract, either party may forthwith give to the other, notice in writing of the existence of such question, dispute or difference, and the same shall be referred to the adjudication of two Arbitrators, one to be nominated by the purchaser and the other to be nominated by the supplier in the case of said Arbitrator not agreeing, then to adjudication of the Umpire to be appointed by the Arbitrator, whose, decision shall be final and binding on the parties and the provisions of the Indian Arbitrator Act 1940, and of the rules there under and any statutory modification thereof shall be deemed to apply. The Arbitrators or the Umpire as the case may be, are bound to give a detailed speaking award assigning reasons for the findings.

Suppliers under the contract shall be continued by the Supplier during the arbitration proceedings, unless otherwise, directed in writing by the purchaser or unless the matter is such that the work cannot possibly be continued until the decision of the Arbitrator or of the Umpire, as the case may be, is issued.

25. **JURISDICTION:-**

Any dispute or difference, arising under, out of, or in connection with Tender/contract order shall be subject to exclusive jurisdiction of court at Bhopal only.

26. **RANDOM TESTING:-**

26.1 Inspection of material before despatch or waiver of inspection will not relieve the supplier from his responsibility to supply the material strictly in accordance with the specification. The Company shall have option to test the samples selected at random from the supplies effected and subject it to routine/acceptance/type test as per IS:2705/1992 to be conducted at CPRI.

26.2 In case, the samples fail to withstand the required test, **the entire lot will be liable to be rejected (i.e. unused material so supplied)** . Such quantities or rejected material as identified shall be removed by the supplier and replaced *in full at his own cost*. The firm shall bear the test charges for such replaced quantities of materials. The Company will not be responsible for levy of taxes on such rejected materials .

26.3 In case the random checking of supplies, if any deviation is noticed, a notice shall be given to the supplier, who shall arrange to depute his representative within 15 days for joint inspection. If during joint inspection any deviation is observed and material supplied is found not conforming to standard laid down in the relevant ISS, the Company reserves the right to impose any penalty for full quantity of material supplied against the order. The decision of the Company in this respect shall be final and binding on the suppliers.

27. **VARIATION IN THE ORDERED QUANTITY:-**

A tolerance in the ordered quantity will be allowed to the extent of  $\pm 2\%$  (plus minus 2%) and not for each consignment. MRCs shall be issued for actual receipt of quantity only.

28. **CORRESPONDENCE:-**

Copies of all important correspondence regarding the order shall be endorsed to the following:-

- i) Dir.(Finance) O/o CMD, MPMKV Co. Ltd., Bhopal
- ii) Concerned consignee(s) i.e. DGM / AGM of Area Stores of MPMKVCL.
- iii) Concerned Sr. Accounts Officer (H.O.A.U.)/Regional Accounts Officer
- iv) CGM (Pur), O/o CMD, MPMKV Co. Ltd., Bhopal

29. **CLIMATIC CONDITIONS:-**

The climate conditions where equipment is intended for installation could be taken as under:

(i)	Maximum temperature of air	:	49° C
(ii)	Minimum temperature of air in shed	:	- 3° C
(iii)	Maximum relative humidity	:	95% (The humidity sometime approaches saturation point)
(iv)	Minimum relative humidity	:	10%
(v)	Average No. of dust-storm days per Annum	:	40 days
(vi)	Average No. of rainy days per Annum	:	90 days
(vii)	No. of months of tropical monsoon conditions per annum.	:	3 months
(viii)	Average annual rain fall	:	1250 mm
(ix)	Maximum wind pressure	:	150 kg/sq. mm.
(x)	Altitude not exceeding	:	1000 meters
	(the limit of ambient temperature shall be 49°C peak and 38°C average over a period of 24 hours)		

**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**

**ANNEXURE –IV****LIST OF CONSIGNEE AREA STORES AND  
SENIOR/REGIONAL ACCOUNTS OFFICER**

Sr. No.	Name of Consignee	Name of Place to which material are to be dispatched	Concerned Sr. AO/RAO MPMKVCL.....
01.	Addl. GM/DGM (Stores), MPMKVCL	Bhopal	Bhopal
02.	Addl. GM/DGM (Stores), MPMKVCL	Gwalior	Gwalior
03.	Addl. GM/DGM (Stores), MPMKVCL	Guna	Guna

**SCHEDULE-I**  
**(PRICE & QUANTITY SCHEDULE)**

(To be posted online only)

Sl. No	Particulars	Quantity required (tendered) (in nos.)	Quantity offered i.e. quoted for in Bid (in nos.)	Ex-works price (including packing & forwarding charges) (in Rs.)  'FIRM' Price	Freight charges for delivery to MPMKVVCL Area Stores located at Gwalior, Guna & Bhopal. (in Rs.) 'FIRM' Price	Total unit FOR destination 'FIRM' Price including freight charges but excluding ED/ST/VAT & other charges (in Rs.)	Excise duty (in %age & Rs.)	Sales Tax/VAT (in %age & Rs.)	Any other tax (in %age & Rs.)	Total unit FOR destination price any where in MP inclusive of all charges, taxes, duties i.e. freight, ED, ST/VAT etc. (in Rs.)
1	33 KV Polymer Pin 10 KN, Silicon Composite Insulators	15000 nos.								

**NOTE:-**

- As stated in clause 4 of Annexure-I, M.P. Madhya Kshetra Vidyut Vitaran Co. Ltd. is a Registered Dealer for availing the benefit of concessional rates of Sales/Commercial Tax/VAT. For this purpose, necessary declaration form shall be furnished after receipt of material at destination. This shall be kept in view by the bidder, while quoting the competitive prices.
- In case of any of the equipment, import of any accessories is involved, no assistance shall be provided by the Company.
- Rates in various tapering steps shall not be considered.
- The offers, with the rates given in any form/proforma, other than that mentioned above, shall be summarily rejected and shall not be considered, in any case.
- Payment of any type of Govt. statutory levies/taxes will be the responsibility of the bidder.
- Remark if any, may please be specified clearly.

PLACE:

DATE:

SIGNATURE OF TENDERER  
NAME IN FULL  
DESIGNATION/STATUS IN THE FIRM  
COMPANY SEAL.

**SCHEDULE-I**  
**(PRICE & QUANTITY SCHEDULE)**

(To be posted online only)

Sl. No	Particulars	Quantity required (tendered) (in nos.)	Quantity offered i.e. quoted for in Bid (in nos.)	Ex-works price (including packing & forwarding charges) (in Rs.)  'FIRM' Price	Freight charges for delivery to MPMKVCL Area Stores located at Gwalior, Guna & Bhopal. (in Rs.) 'FIRM' Price	Total unit FOR destination 'FIRM' Price including freight charges but excluding ED/ST/VAT & other charges (in Rs.)	Excise duty (in %age & Rs.)	Sales Tax/VAT (in %age & Rs.)	Any other tax (in %age & Rs.)	Total unit FOR destination price any where in MP inclusive of all charges, taxes, duties i.e. freight, ED, ST/VAT etc. (in Rs.)
1	11 KV Polymer Pin 5 KN, Long Rod Silicon Composite Insulators	80000 nos.								

**NOTE:-**

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- In case of any of the equipment, import of any accessories is involved, no assistance shall be provided by the Company.
- Rates in various tapering steps shall not be considered.
- The offers, with the rates given in any form/proforma, other than that mentioned above, shall be summarily rejected and shall not be considered, in any case.
- Payment of any type of Govt. statutory levies/taxes will be the responsibility of the bidder.
- Remark if any, may please be specified clearly.

PLACE:

DATE:

SIGNATURE OF TENDERER  
NAME IN FULL  
DESIGNATION/STATUS IN THE FIRM  
COMPANY SEAL.

**SCHEDULE-I**  
**(PRICE & QUANTITY SCHEDULE)**

(To be posted online only)

Sl. No	Particulars	Quantity required (tendered) (in nos.)	Quantity offered i.e. quoted for in Bid (in nos.)	Ex-works price (including packing & forwarding charges) (in Rs.)  'FIRM' Price	Freight charges for delivery to MPMKVCL Area Stores located at Gwalior, Guna & Bhopal. (in Rs.) 'FIRM' Price	Total unit FOR destination 'FIRM' Price including freight charges but excluding ED/ST/VAT & other charges (in Rs.)	Excise duty (in %age & Rs.)	Sales Tax/VAT (in %age & Rs.)	Any other tax (in %age & Rs.)	Total unit FOR destination price any where in MP inclusive of all charges, taxes, duties i.e. freight, ED, ST/VAT etc. (in Rs.)
1	33 KV Polymer Disc Insulators	16000 nos.								

**NOTE:-**

- As stated in clause 4 of Annexure-I, M.P. Madhya Kshetra Vidyut Vitaran Co. Ltd. is a Registered Dealer for availing the benefit of concessional rates of Sales/Commercial Tax/VAT. For this purpose, necessary declaration form shall be furnished after receipt of material at destination. This shall be kept in view by the bidder, while quoting the competitive prices.
- In case of any of the equipment, import of any accessories is involved, no assistance shall be provided by the Company.
- Rates in various tapering steps shall not be considered.
- The offers, with the rates given in any form/proforma, other than that mentioned above, shall be summarily rejected and shall not be considered, in any case.
- Payment of any type of Govt. statutory levies/taxes will be the responsibility of the bidder.
- Remark if any, may please be specified clearly.

PLACE:

DATE:

SIGNATURE OF TENDERER  
NAME IN FULL  
DESIGNATION/STATUS IN THE FIRM  
COMPANY SEAL.

**SCHEDULE-I**  
**(PRICE & QUANTITY SCHEDULE)**

(To be posted online only)

Sl. No	Particulars	Quantity required (tendered) (in nos.)	Quantity offered i.e. quoted for in Bid (in nos.)	Ex-works price (including packing & forwarding charges) (in Rs.)  'FIRM' Price	Freight charges for delivery to MPMKVCL Area Stores located at Gwalior, Guna & Bhopal. (in Rs.) 'FIRM' Price	Total unit FOR destination 'FIRM' Price including freight charges but excluding ED/ST/VAT & other charges (in Rs.)	Excise duty (in %age & Rs.)	Sales Tax/VAT (in %age & Rs.)	Any other tax (in %age & Rs.)	Total unit FOR destination price any where in MP inclusive of all charges, taxes, duties i.e. freight, ED, ST/VAT etc. (in Rs.)
1	11 KV Polymer Disc 45 KN, Long Rod Silicon Composite Insulators	50000 nos.								

**NOTE:-**

- As stated in clause 4 of Annexure-I, M.P. Madhya Kshetra Vidyut Vitaran Co. Ltd. is a Registered Dealer for availing the benefit of concessional rates of Sales/Commercial Tax/VAT. For this purpose, necessary declaration form shall be furnished after receipt of material at destination. This shall be kept in view by the bidder, while quoting the competitive prices.
- In case of any of the equipment, import of any accessories is involved, no assistance shall be provided by the Company.
- Rates in various tapering steps shall not be considered.
- The offers, with the rates given in any form/proforma, other than that mentioned above, shall be summarily rejected and shall not be considered, in any case.
- Payment of any type of Govt. statutory levies/taxes will be the responsibility of the bidder.
- Remark if any, may please be specified clearly.

PLACE:

DATE:

SIGNATURE OF TENDERER  
NAME IN FULL  
DESIGNATION/STATUS IN THE FIRM  
COMPANY SEAL.

**SCHEDULE-I**  
**(PRICE & QUANTITY SCHEDULE)**

(To be posted online only)

Sl. No	Particulars	Quantity required (tendered) (in nos.)	Quantity offered i.e. quoted for in Bid (in nos.)	Ex-works price (including packing & forwarding charges) (in Rs.)  'FIRM' Price	Freight charges for delivery to MPMKVCL Area Stores located at Gwalior, Guna & Bhopal. (in Rs.) 'FIRM' Price	Total unit FOR destination 'FIRM' Price including freight charges but excluding ED/ST/VAT & other charges (in Rs.)	Excise duty (in %age & Rs.)	Sales Tax/VAT (in %age & Rs.)	Any other tax (in %age & Rs.)	Total unit FOR destination price any where in MP inclusive of all charges, taxes, duties i.e. freight, ED, ST/VAT etc. (in Rs.)
1	11 KV Post Insulators (6.6 KN)	1000 nos.								

**NOTE:-**

- As stated in clause 4 of Annexure-I, M.P. Madhya Kshetra Vidyut Vitaran Co. Ltd. is a Registered Dealer for availing the benefit of concessional rates of Sales/Commercial Tax/VAT. For this purpose, necessary declaration form shall be furnished after receipt of material at destination. This shall be kept in view by the bidder, while quoting the competitive prices.
- In case of any of the equipment, import of any accessories is involved, no assistance shall be provided by the Company.
- Rates in various tapering steps shall not be considered.
- The offers, with the rates given in any form/proforma, other than that mentioned above, shall be summarily rejected and shall not be considered, in any case.
- Payment of any type of Govt. statutory levies/taxes will be the responsibility of the bidder.
- Remark if any, may please be specified clearly.

PLACE:

DATE:

SIGNATURE OF TENDERER

NAME IN FULL

DESIGNATION/STATUS IN THE FIRM

COMPANY SEAL.

**SCHEDULE-I**  
**(PRICE & QUANTITY SCHEDULE)**

(To be posted online only)

Sl. No	Particulars	Quantity required (tendered) (in nos.)	Quantity offered i.e. quoted for in Bid (in nos.)	Ex-works price (including packing & forwarding charges) (in Rs.)  'FIRM' Price	Freight charges for delivery to MPMKVCL Area Stores located at Gwalior, Guna & Bhopal. (in Rs.) 'FIRM' Price	Total unit FOR destination 'FIRM' Price including freight charges but excluding ED/ST/VAT & other charges (in Rs.)	Excise duty (in %age & Rs.)	Sales Tax/VAT (in %age & Rs.)	Any other tax (in %age & Rs.)	Total unit FOR destination price any where in MP inclusive of all charges, taxes, duties i.e. freight, ED, ST/VAT etc. (in Rs.)
1	33 KV Post Insulators (10 KN)	1000 nos.								

**NOTE:-**

- As stated in clause 4 of Annexure-I, M.P. Madhya Kshetra Vidyut Vitaran Co. Ltd. is a Registered Dealer for availing the benefit of concessional rates of Sales/Commercial Tax/VAT. For this purpose, necessary declaration form shall be furnished after receipt of material at destination. This shall be kept in view by the bidder, while quoting the competitive prices.
- In case of any of the equipment, import of any accessories is involved, no assistance shall be provided by the Company.
- Rates in various tapering steps shall not be considered.
- The offers, with the rates given in any form/proforma, other than that mentioned above, shall be summarily rejected and shall not be considered, in any case.
- Payment of any type of Govt. statutory levies/taxes will be the responsibility of the bidder.
- Remark if any, may please be specified clearly.

PLACE:

DATE:

SIGNATURE OF TENDERER  
NAME IN FULL  
DESIGNATION/STATUS IN THE FIRM  
COMPANY SEAL.

## Annexure-A

### Tests on Insulator Units

#### 1 RIV Test (Dry):-

The insulator string along with complete hardware fittings shall have a radio interference voltage level below 100 micro volts at one MHz when subjected to 50 Hz AC voltage of 10 kV for 11 kV class insulators respectively under dry condition. The test procedure shall be in accordance with IS:326B /I EC : 437/CISPfi 18-2.

#### 2 Brittle Fracture Resistance Test:-

Brittle fracture test shall be carried out on naked rod along with end fittings by applying "1 n HNO3 acid" (63 g cone, HNO3 added to 937 g water) to the rod. The rod should be held at 80% of SML for the duration of the test. The rod should not fail within the 96 hour test duration. Test arrangement should ensure continuous wetting of the rod with Nitric acid.

#### 3 Recovery of Hydrophobicity & Corona test:-

The test shall be carried out on 4mm thick samples of 5cm x 7cm

- i) The surface of selected samples shall be cleaned with isopropyl alcohol. Allow the surface to dry and spray with water Record the Hydrophobicity classification in line with STRI guide for Hydrophobicity classification.. Dry the sample surface.
- ii) The sample shall be subjected to mechanical stress by bending the sample over a ground electrode. Corona is continuously generated by applying 12 kV to a needle like electrode placed 1mm above the sample surface. The test shall be done for 100 hrs.
- iii) Immediately after the corona treatment, spray the surface with water and record the HC classification. Dry the surface and repeat the corona treatment as at clause 7 above. Note HC classification. Repeat the cycle for 1000 hrs. or until an HC of 6 or 7 is obtained. Dry the sample surface.
- iv) Allow the sample to recover and repeat hydrophobicity measurement at several time intervals. Silicone rubber should recover to HC 1 - HC 2 within 24 to 48 hours, depending on the material and the intensity of the corona treatment.

#### 4 Chemical composition test for Silicon content

The content of silicon in the composite polymer shall be evaluated by EDX (Energy Dispersion X-ray) Analysis or Thermo-gravimetric analysis. The test may be carried out at CPRI or any other NABL accredited laboratory.

**SCHEDULE-II (A)****TECHNICAL SPECIFICATION FOR COMPOSITE POLYMER PIN  
INSULATORS FOR USE IN 11KV and 33KV SYSTEM****1.0 SCOPE::**

This specification covers design, manufacture, testing and supply of Composite Polymer Pin Insulators for use in the 11KV & 33KV overhead transmission lines. The Composite Pin Insulators shall be of the following type:-

- i) Long rod type Pin Insulators intended to be mounted rigidly on a supporting structure to support following size of conductor:-
- (a) For 11KV AAAC Rabbit
  - (b) For 33KV AAAC Dog

**2.0 APPLICABLE STANDARDS::****2.1 Standards:-**

Following Indian/International Standards, which shall mean latest revision, with amendments/changes adopted and published, unless specifically stated otherwise in the Specification, shall be referred while accessing conformity of Insulators with these specifications.

- 2.1.1 In the event of supply of Insulators conforming to standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent or better to those specified. In case of award, salient features of comparison between the standards proposed by the Bidder and those specified in this document will be provided by the Supplier to establish equivalence.

Sr. No.	Indian Standard	Title	International Standard
1		Definition, test methods and acceptance criteria for composite Insulators for a. c. overhead lines above 1000V.	IEC:61109
2	IS: 731	Porcelain insulators for overhead power lines with a nominal voltage greater than 1000V.	IEC: 60383
3	IS:2071	Methods of High Voltage Testing.	IEC:60060-1
4	IS:2486	Specification for Insulator fittings for overhead power lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements locking devices.	IEC:60120 IEC:60372
5	-	Thermal Mechanical performance test and mechanical performance test on string Insulators units.	IEC:60575
6	IS: 13134	Guide for the selection of insulators in respect of polluted condition.	IEC: 60815
7	-	Characteristics of string insulator units of the long rod type.	IEC: 60433

Sr. No.	Indian Standard Standard	Title	International Standard
8	-	Hydrophobicity Classification Guide.	STRI guide 1.92/1
9	-	Radio interference characteristics of overhead power lines and high voltage equipment.	CISPR 18.2 Part 2
10	IS:8263	Methods of RI Test of HV Insulators.	IEC:60437
11		Standard for Insulators- Composite- Distribution Dead-end Type.	ANSI C 29.13-2000
12	IS:4759	Hot dip zinc coatings on structural steel & other allied products.	ISO:1459
13	IS:2629	Recommended practice for Hot Dip galvanization for iron and steel	ISO:1461(E)
14	IS:6745	Determination of weight of zinc coating on zinc coated Iron and steel articles.	ISO:1460
15	IS:3203	Methods of testing of local thickness of electroplated coatings.	ISO:2178
16	IS:2633	Testing of Uniformity of coating of zinc coated articles.	
17	-	Standard specification for glass fiber standards.	ASTM D 578-05
18	-	Standard specification for compositional analysis by Thermo-gravimetry.	ASTM D 578-05
19	IS:4699	Specification for refined secondary zinc	

### 3.0 TECHNICAL DESCRIPTION OF COMPOSITE INSULATORS::

#### 3.1 Service condition:-

The polymer Insulators to be supplied shall be suitable for satisfactory continuous operation under conditions as specified below:

(i)	Maximum temperature of air in shed	49°C
(ii)	Minimum temperature of air in shed	-3°C
(iii)	Maximum relative humidity	95% (The humidity some time approaches saturation point)
(iv)	Minimum relative humidity	10 %
(v)	Average number of dust-storm days per annum	40 days
(vi)	Average number of rainy days per annum	90 days
(vii)	Number of months of tropical monsoon conditions per annum	3 months
(viii)	Average annual rainfall	1250 mm
(ix)	Maximum wind pressure	150 Kg / Sq. mm
(x)	Altitude not exceeding	1000 metres
(The limit of ambient temperature shall be 49°C peak and 38°C average over a period of 24 hours)		

### 3.2 Composite Insulators long rod type to support conductor on 11KV & 33KV Over head Power Lines:-

- 3.2.1 The Insulators shall be suitable for 3  $\Phi$ , 50 Hz, effectively earthed 11 KV and 33 KV O/H distribution system in a moderately polluted atmosphere.
- 3.2.2 Bidder must be an indigenous manufacturer and supplier of composite Insulators of rating 11KV or above OR must have developed proven in house technology and manufacturing process for composite Insulators of above rating OR possess technical collaboration/ association with a manufacturer of composite Insulators of rating 11KV or above. The Bidder shall furnish necessary evidence in support of the above along with the bid, which can be in the form of certification from the utilities concerned, or any other documents to the satisfaction of the owner.
- 3.2.3 Insulators shall have sheds with good self-cleaning properties. Insulator shed profile, spacing, projection etc, and selection in respect of polluted conditions shall be generally in accordance with the recommendation of IEC-60815/IS: 13134.
- 3.2.4 The size of Composite insulator, minimum creepage distance and mechanical strength along with hardware fittings shall be as follows:

SN	Type of composite Insulator	Nominal system voltage KV (rms)	Highest system voltage KV (rms)	Visible discharge test voltage KV (rms)	Wet power frequency withstand voltage KV (rms)	Impulse withstand voltage KV (rms)	Minimum creepage distance (mm)	Min. failing load KN
i.	11KV Pin Insulator	11	12	9	35	75	320	5
ii.	33KV Pin Insulator	33	36	27	75	170	900	10

**Note:** Creepage distances have been considered in line with IS-13134 (which specifies 20mm/ KV for moderately polluted environment and 25mm/KV for heavily polluted area)

### 3.3 Dimensional Tolerance of Composite Insulators :-

The tolerances on all dimensions e.g. diameter, length and creepage distance shall be allowed as follows in line with IEC 61109:

$\pm \{0.04d+1.5\}$  mm when  $d < 300$  mm,

$\pm (0.025d+6J)$  mm when  $d > 300$  mm.

Where, d being the dimensions in millimeters for diameter, length or creepage distance as the case may be,

However, no negative tolerance shall be applicable to creepage distance.

### 3.4 Corona and RI Performance:-

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.

#### **4.0 BASIC FEATURES::**

##### **4.1 Design and construction:-**

The Composite Pin Insulator shall have a core, housing & weather shed of insulating material and steel/aluminum alloy hardware components for attaching it to the support/conductor.

##### **4.1.1 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 or Boron free E-Glass 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.

##### **4.1.2 Housing (Sheath):-**

The FRP rod shall be covered by a seamless sheath of a silicone electrometric compound or silicone alloy compound of a thickness of 3mm 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. Housing shall conform to the requirements of IEC 61109/92-93 with latest amendments.

##### **4.1.3 Weather sheds:-**

The composite polymer weather sheds made of a silicone elastometric compound or silicone alloy compound shall be firmly bonded to the sheath, vulcanized to the sheath or 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 weather sheds should have silicon 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.

##### **4.1.4 End Fittings:-**

End fittings 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. They shall be connected to the rod by means of a controlled compression technique. 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 gap between fitting and sheath shall be sealed by a flexible silicone electrometric compound or silicone alloy compound sealant. System of attachment 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 has been shown in the drawing (11KV & 33KV both separately). The details of end fittings for fixing the same with V-Cross Arms and top clamps are given below:-

Sl. No.	Item	Length of end fittings to be fixed	Min. threaded portion of end fittings	Dia of rod
i.	11KV	150 mm	100 mm	20 mm
ii.	33KV	150 mm	100 mm	24 mm

Upper end fittings shall be suitable to hold AAAC Dog for 33KV and AAAC Rabbit for 11KV. The size of the fittings shall be in such a way that conductor could be bound firmly so that it may not slip from the groove while in service even under adverse conditions.

## 5.0 WORKMANSHIP::

- 5.1 All the materials shall be of latest design and conform to the best engineering practices adopted in the high voltage field. Bidders shall offer only such Insulators as are guaranteed by them to be satisfactory and suitable for continued good service in power transmission lines.
- 5.2 The design, manufacturing process and material control at various stages shall be such as to give maximum working load, highest mobility, best resistance to corrosion, good finish and elimination of sharp edges and corners.
- 5.3 The design of the Insulators shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to deterioration.
- 5.4 The core shall be sound and free of cracks and voids that may adversely affect the Insulators.
- 5.5 Weather sheds shall be uniform in quality. They shall be clean, sound, smooth and shall be free from defects and excessive flashing at parting lines.
- 5.6 End fittings shall be free from cracks, seams, shrinks, air holes and rough edges. End fittings should be effectively sealed to prevent moisture ingress; effectiveness of sealing system must be supported by test documents. All surfaces of the metal parts shall be perfectly smooth with out projecting points or irregularities, which may cause corona. All load bearing surfaces shall be smooth and uniform so as to distribute the loading stresses uniformly.
- 5.7 All ferrous parts shall be hot dip galvanized to give a minimum average coating of zinc equivalent to 610 gm/Sq.m, or 87 $\mu$  m thickness and shall be in accordance with the requirement of IS: 4759, The zinc used for galvanizing shall be of purity 99.5% as per IS: 4699. The zinc coating shall be uniform, adherent, smooth, reasonably bright continuous and free from imperfections such as flux, ash rust stains, bulky white deposits and blisters. The galvanized metal parts shall be guaranteed to withstand at least four successive dips

each lasting for one H) minute duration under the standard preece test. The galvanizing shall be carried out only after any machining.

## **6.0 EQUIPMENT MARKING::**

6.1 Each insulator unit shall be legibly and indelibly marked with the following details as per IEC-61109:

- (a) Month & Year of manufacture
- (b) Min. failing toad/guaranteed mechanical strength in kilo Newton followed by the word 'KN' to facilitate easy identification.
- (c) Manufacturer's name/Trade mark

## **7.0 BID DRAWINGS::**

7.1 The Bidder shall furnish full description and illustration of the material offered.

7.2 The Bidder shall furnish along with the bid the outline drawing (3 copies) of each insulator unit including a cross sectional view of the long rod insulator unit. The drawing shall include but not be limited to the following information:

- (a) Long rod diameter with manufacturing tolerances
- (b) Minimum Creepage distance with positive tolerance
- (c) Protected creepage distance
- (d) Eccentricity of the long rod unit
  - (i) Axial run out
  - (ii) Radial run out
- (e) Unit mechanical and electrical characteristics
- (f) Weight of composite long rod unit.
- (g) Materials
  - (i) Identification mark
  - (ii) Manufacturer's catalogue number

7.3 After placement of award, the Supplier shall submit three sets of full dimensioned manufacturing insulator drawings containing all the details to The Chief General Manager (Pur), MPMKVCL, Bhopal.

7.4 After placement of award the Supplier shall also submit fully dimensioned insulator crate drawing for different type of Insulators for approval of the owner.

## **8.0 TESTS AND STANDARDS::**

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 design & type test reports submitted shall not be more than 05 years old.

### **8.1 Design Tests:-**

For polymeric 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 subjected 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:

- Same materials for the core, and sheds and same manufacturing method;
- Same material of the fittings, the same design, the same method of attachment;
- Same or greater layer thickness of the shed material over the core (including a sheath where used);
- Same or smaller ratio of the highest system voltage to insulation length;
- Same or smaller ratio of all mechanical loads to the smallest core diameter between fittings
- Same or 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.

## 8.2 Type Tests:-

The tenderer shall furnish detailed type test reports of the offered composite Insulators as per clause 8.2 of the Technical Specifications at the NABL approved laboratories to prove that the composite Insulators offered meet the requirements of the specification. These Type Tests should have been carried out within five years prior to the date of opening of this tender. The following type tests shall be conducted on a suitable number of individual insulator units, components & materials and the test report should invariably be submitted with the bid:-

SN	Description of type test	Ten procedure/standard
1.	Dry lightning impulse withstand voltage test	As per IEC 61109 (clause 6.1)
2.	Wet power frequency test	As per IEC 61 109 (clause 6,2)
3.	Mechanical failing load test	As per IS:731 (Clause- 10.8.2)
4.	Radio interference test	As per IEC 61109 (clause 6.4)
5.	Recovery of Hydrophobicity test	Annexure-A This test may be repealed every 3 yrs by the manufacturer
6.	Chemical composition test for silicon content	Annexure-A Or any other test method acceptable to the owner
7.	Brittle fracture resistance test	Annexure - A

Note:- The purchase may like to conduct any other test(s) in addition to above tests at bidder's cost to establish the performance of material as per system requirement.

8.2.2 It shall be the option of the owner to accept the Insulators based on type test reports submitted by the manufacturer. The owner shall be free to repeat the type test & may witness the same.

**Note:** The owner, for the purpose of facilitating the type tests, may ask the bidders to quote test charges separately

8.2.3 All the type test given in Clause No. 8.2 in addition to routine & acceptance test shall be carried out on Pin Insulators wherever required.

### 8.3 Acceptance (sample) Tests

a.	Verification of dimensions	Clause 7.2 IEC: 61109
b.	Verification of the locking system (if applicable)	Clause 7.3 IEC: 61 109
c.	Galvanizing test	IS:2633/IS:6745
c.	Verification of tightness of the interface between end fittings & Insulator housing	Clause 7.4 IEC:61109 amendment 1 of 1995
d.	Verification of the specified mechanical load	Clause 7.4 IEC: 611 09 / IS:731

The test samples after having withstood the routine test shall be subjected to the following acceptance tests:-

#### Routine Tests:-

SN	Description	Standard
1.	Identification of marking	As per IEC: 61 109 Clause 8.1
2.	Visual Inspection	As per IEC 61 109 Clause 8.2
3.	Mechanical routine test	As per IEC:61109 / IS:731

### 8.5 Tests during Manufacture

Following tests shall also be carried out on all components as applicable:-

a)	Chemical analysis of zinc used for galvanizing
b)	Chemical analysis, mechanical, metallographic test and magnetic particle inspection for malleable castings.
c)	Chemical analysis, hardness tests and magnetic particle inspection for forgings

- a) Chemical analysis of zinc used for galvanizing
- b) Chemical analysis, mechanical, metallographic test and magnetic particle inspection for malleable castings.
- c) Chemical analysis, hardness tests and magnetic particle inspection for forgings.

### 8.6 Additional Tests:-

8.6.1 The Owner reserves the right at his own expenses, for carrying out any other test(s) of reasonable nature carried out at Supplier's premises, at site, or in any other place in

addition to the aforesaid type, acceptance and routine tests to satisfy himself that the material comply with the Specifications.

- 8.6.2 The Owner also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Supplier's premises or at any other test center. In case of evidence of non compliance, it shall be binding on the part of the Supplier to prove the compliance of the items to the technical specifications by repeat tests or correction of deficiencies or replacement of defective items, all without any extra cost to the Owner,

**9.0 Quality assurance plan:-**

9.1 The successful bidder shall submit following information to the owner:

9.1.1 Test certificates of the raw materials and bought out accessories.

9.1.2 Statement giving list of important raw materials, their grades along with names of sub-suppliers for raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in presence of bidder's representative.

9.1.2 List of manufacturing facilities available.

9.1.3 Level of automation achieved and lists of areas where manual processing exists.

9.1.4 List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

9.1.5 List of testing equipments available with the bidder for final testing of equipment along with valid calibration reports.

9.1.6 The manufacturer shall submit Manufacturing Quality Plan (MQP) for approval & the same shall be followed during manufacture and testing,

9.1.7 The successful bidder shall submit the routine test certificates of bought out raw materials / accessories and central excise passes for raw material at the time of inspection.

**10.0 Guarantee:-**

The Supplier of Insulators shall guarantee overall satisfactory performance of the Insulators for the period of 18 months from the date of supply.

**11.0 INSPECTION::**

11.1 The owner's representative shall at all times be entitled to have access to the works and all places of manufacture, where insulator, and its component parts shall be manufactured and the representatives shall have full facilities for unrestricted inspection of the Supplier's and sub-Supplier's works, raw materials, manufacture of the material and for conducting necessary test as detailed herein.

- 11.2. The material for final inspection shall be offered by the Supplier only under packed condition. The owner shall select samples at random from the packed lot for carrying out acceptance tests. The lot offered for inspection shall be homogeneous and shall contain Insulators manufactured in 3-4 consecutive weeks.
- 11.3 The Supplier shall keep the Owner informed in advance of the time of starting and the progress of manufacture of material in their various stages so that arrangements could be made for inspection.
- 11.4 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested unless the inspection is waived off by the owner in writing. In the later case also the material shall be dispatched only after satisfactory testing specified herein has been completed.
- 11.5 The acceptance of any quantity of material shall in no way relieve the Supplier of his responsibility for meeting all the requirements of the specification and shall not prevent subsequent rejection, if such materials are later found to be defective.
- 12.0 PACKING::**
- 12.1 All Insulators shall be packed in strong corrugated box of min, 7 ply duly palletted or wooden crates. The gross weight of the crates along with the material shall not normally exceed 100 Kg to avoid handling problem. The crates shall be suitable for outdoor storage under wet climate during rainy season.
- 12.2 The packing shall be of sufficient strength to withstand rough handling during transit, storage at site and subsequent handling in the field.
- 12.3 Suitable cushioning, protective padding, or dunnage or spacers shall be provided to prevent damage or deformation during transit and handling.
- 12.4 All packing cases shall be marked legibly and correctly so as to ensure safe arrival at their destination and to avoid the possibility of goods being lost or wrongly dispatched on account of faulty packing and faulty or illegible markings. Each wooden case/crate/corrugated box shall have all the markings stenciled on it in indelible ink.
- 12.5 The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**

**SCHEDULE – II (C)****TECHNICAL SPECIFICATION OF 11 KV & 33 KV PORCELAIN POST INSULATORS SUITABLE FOR DO FUSE UNITS & AB SWITCHES**

1. Application :- The Porcelain post Insulators are intended to be utilised on D.O.Fuses and AB switches for maintenance purpose , therefore the metal part shall be specified to suit the requirement . Detailed dimensional drawings shall be submitted along with offer.

2. Applicable Standard:- Unless otherwise modified in this specification, the Porcelain Post Insulators shall conform to IS:2544/1973 as amended from time to time.

3. Post Insulators :

. The insulators shall conform to IS:2544 of 1973 with latest amendment. The porcelain used for manufacture of Post Insulators shall be homogeneous, free from flaws or imperfections that might effect the mechanical or dielectric strength. They shall be thoroughly vitrified tough and impervious to moisture. The glazing of the porcelain shall be of uniform brown colour free from blisters, burns and other similar defects. Insulators of the same rating and type shall be interchangeable.

The porcelains and metal parts shall be assembled in such a manner that any thermal expansion differential between the metal and porcelain parts through range of temperature variation shall not loosen parts or create undue internal stresses which may affect the electrical or mechanical strength and rigidity. Each cap and base pin shall be made of high grade cast steel or malleable steel casting and they shall be machine faced and smoothly galvanized. The cap and base shall be properly cemented with insulators to give perfect grip. Excess use of cement shall be avoided.

Each 11KV & 33KV Post Insulators should have technical particulars as detailed below:-

	<b><u>11KV</u></b>	<b><u>33KV</u></b>
[i] Nominal system voltage KV (rms)	11	33
[ii] Highest system voltage KV (rms)	12	36
[iii] Dry Power Frequency one minute withstand voltage KV(rms)	35	75
[iv] Power Frequency puncture voltage KV (rms)	1.3 times the actual dry flashover voltage.	
[v] Impulse withstand voltage KV (rms)	75	170
[vi] Visible discharge voltage KV (rms)	9	27
[vii] Creepage distance in mm (minimum)	320	580
[viii] Cantilever strength (KN)	6.60	10.0

4. As stated above unless otherwise modified in this specification the drop out fuses shall conform to IS:9385 (Part-I to III) and as amended from time to time.

5. Rated Voltage:- The rated voltage shall be 11KV and 33KV for 11KV and 33KV system respectively.

6. Temperature Rise Limit In Air Above Ambient Temperature:-

Shall be as per ISS.

7. Design, materials and workmanship: - The successful tenderers shall assume full responsibility for co-ordination and adequate design. All materials used in the construction of the Post Insulators shall be of the appropriate class, well finished and of approved design and material. All similar parts should be accurately finished and interchangeable. The connecting of cap and pin with insulator should be perfect to avoid any kind of loosening. After cementing the insulator should be cured adequately in water to attain good gripping.

8. Guaranteed Data and other Technical Particulars :-

Guaranteed data and other technical particulars of the Porcelain Post Insulators shall be furnished as Shedule III (D) by the bidder indicating all relevant dimensions, weight, electrical characteristics as per Sr, No. 3 & ISS.

9. Tests:- The 33&11 KV post insulators shall strictly comply with requirement of all the type tests and shall be subjected to all routine tests stipulated in the relevant standard. All tests shall be made prior to despatch in the presence of the representative of the purchaser. No material should be despatched without prior approval of the tests certificate by the purchaser.

The tenderer should note that alongwith the tender, the following type test certificate as per ISS:2544/1973 (with latest amendment) must be furnished. The type test should not be older than 5 (five) years from the date of opening of tender and should be performed in the Govt. recognized Laboratory such as CPRI:-

- (i) Impulse voltage withstand test,
- (ii) H.V. Power Frequency dry / wet withstand test.
- (iii) Temperature rise test.

The supplier should invariably furnish Routine Test certificate Post Insulator of their manufacturers alongwith the inspection report .

10. Marking:-

Each insulator shall be legibly and indelibly marked to show the followings:-

- a. Name and trade mark of manufacturer
- b. Month and year of manufacture
- c. Minimum failing load in Newtons
- d. Country of manufacture
- e. Company Logo "CMD(CZ)"

Marking of porcelain shall be engraved and shall be applied before firing.

Please note that paper should not be used for name plate. The material should be packed in appropriate wooden cartoons, so as to sustain transport hazards.

11. Drawing :-

The dimensional drawing of 11 KV and 33KV Porcelain Post Insulators shall be given in the offer . Creepage length of 11 KV Post insulator shall be 320 mm & of 33 KV 580 mm.

12. Inspection :

12.1 The purchaser's representative shall at all times be entitled to have access to the works and all places of manufacture where equipment/material shall be manufactured and the representative shall have full facilities for unrestricted inspection of the supplier's works raw materials and process of manufacture for conducting necessary tests as detailed herein.

12.2 The supplier shall keep the purchaser informed in advance of the time of starting and of the progress of manufacture of equipment/material in its various stages so that arrangements can be made for inspection.

12.3 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested, unless the inspection is waived off by the purchaser in writing. In the later case also, the equipment/material shall be dispatched only after satisfactory testing for all tests specified herein has been completed.

12.4 The acceptance of any quantity of material shall in no way relieve the supplier of any of his responsibilities for meeting all requirements of the specification, and shall not prevent subsequent rejection if such material is later found to be defective.

12.5 The number of sample selected to carryout the acceptance test shall be as per provision in the respective IS.

12.6. The purchaser has the right to have the tests carried out by an independent Agency subject to recovery of testing expenditure in case of failure, whenever there is dispute regarding the quality of supply.

**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**  
**O/o CMD MPMKVCL BHOPAL**

**SCHEDULE-II (D)****TECHNICAL SPECIFICATION FOR 11/15 KV and 33/35 KV POLYMER(SILICON) COMPOSITE INSULATORS LONG ROD TYPE SUITABLE FOR T&C HARDWARE****1.0 SCOPE::**

This specification covers design, manufacture, testing and supply of composite Insulators for use in the 11 KV / 33 KV overhead transmission lines and substations. The composite Insulators shall be of the following type:

- i) Long rod Insulators for conductors in tension application at angle/cut points. The Insulators shall be of tongue & Clevis type.

**2.0 APPLICABLE STANDARDS::****2.1 Standards:-**

Following Indian/International Standards, which shall mean latest revision, with amendments/changes adopted and published, unless specifically stated otherwise in the Specification, shall be referred while accessing conformity of Insulators with these specifications.

- 2.1.2 In the event of supply of Insulators conforming to standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent or better to those specified. In case of award, salient features of comparison between the standards proposed by the Bidder and those specified in this document will be provided by the Supplier to establish equivalence.

SNo.	Indian Standard Standard	Title	International Standard
1		Definition, test methods and acceptance criteria for composite Insulators for a.c. overhead lines above 1000V.	IEC:61109
2	IS:2071	Methods of High Voltage Testing.	IEC:60060-1
3	IS:2486	Specification for Insulator fittings for overhead power lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements locking devices.	IEC:60120 IEC:60374
4		Thermal Mechanical performance test and mechanical performance test on string Insulators units	IEC:60575
5		Characteristics of string Insulator units of the long rod type.	IEC:60433
6		Hydrophobicity Clarification Guide.	STRI guide 1.92/1
7		Radio interference characteristics of overhead	CISPR18-2 Part

SNo.	Indian Standard Standard	Title	International Standard
		power lines and high voltage equipment.	2
8	IS:8263	Methods of RI Test of HV Insulators	IEC:60437
9		Standard for Insulators – Composite-Distribution Dead -end type.	ANSI-C29.132-2000
10	IS:4759	Hot dip zinc coatings on structural steel & other allied products.	ISO:1459
11	IS:2629	Recommended practice for Hot Dip galvanization for iron and steel	ISO:1461(E)
12	IS:6745	Determination of weight of zinc coating on zinc coated Iron and steel articles.	ISO:1460
13	IS:3203	Methods of testing of local thickness of electroplated coatings.	ISO:2178
14	IS:2633	Testing of Uniformity of coating of zinc coated articles.	
15		Standard specification for glass fiber standards.	ASTM D 578-05
16		Standard specification for compositional analysis by Thermogravimetry.	ASTM D 578-05
17	IS:4699	Specification for refined secondary zinc	

### 3.0 TECHNICAL DESCRIPTION OF COMPOSITE INSULATORS::

#### 3.1 Service condition:-

The polymer Insulators to be supplied shall be suitable for satisfactory continuous operation under conditions as specified below:

(i)	Maximum temperature of air in shed	45°C
(ii)	Minimum temperature of air in shed	4°C
(iii)	Maximum relative humidity	95% (The humidity some time approaches saturation point)
(iv)	Minimum relative humidity	10 %
(v)	Average number of dust-storm days per annum	40 days
(vi)	Average number of rainy days per annum	90 days
(vii)	Number of months of tropical monsoon conditions per annum	3 months
(viii)	Average annual rainfall	1250 mm
(ix)	Maximum wind pressure	150 Kg / Sq. mm
(x)	Altitude not exceeding	1000 metres
(The limit of ambient temperature shall be 45°C peak and 35°C average over a period of 24 hours)		

#### 3.2 Composite Insulators long rod type for tension locations:-

- 3.2.1 The Insulators shall be suitable for 3  $\Phi$ , 50 Hz, effectively earthed 11kV and 33kV O/H distribution system in a moderately polluted atmosphere. Long rod Insulators shall be of tongue & clevis type.
- 3.2.2 Bidder must be an indigenous manufacturer and supplier of composite Insulators of rating 33kV or above OR must have developed proven in house technology and manufacturing process for composite Insulators of above rating OR possess technical collaboration/ association with a manufacturer of composite Insulators of rating 33 kV or above. The Bidder shall furnish necessary evidence in support of the above along with the bid, which can be in the form of certification from the utilities concerned, or any other documents to the satisfaction of the owner.
- 3.2.3 Insulators shall have sheds with good self-cleaning properties. Insulator shed profile, spacing, projection etc, and selection in respect of polluted conditions shall be generally in accordance with the recommendation of IEC-60815/IS: 13134.
- 3.2.4 The size of Composite insulator, minimum creepage distance and mechanical strength along with hardware fittings shall be as follows:

SN	Type of composite Insulator	Nominal system voltage kV (rms)	Highest system voltage kV (rms)	Visible discharge test voltage kV(rms)	Wet power frequency withstand voltage kV (rms)	Impulse withstand voltage kV (rms)	Minimum creepage distance (mm)	Min. failing load KN	Pin ball shank diameter (mm)
i.	Long rod Insulators	11	12	9	35	75	240	45	16
		33	36	27	75	170	720	45	16

**Note:** Creepage distances have been considered in line with IS-13134 (which specifies 20mm/ kV for moderately polluted environment).

#### 3.4 Dimensional Tolerance of Composite Insulators :-

The tolerances on all dimensions e.g. diameter, length and creepage distance shall be allowed as follows in line with-IEC 61109:

- $\pm \{0,04d+1.5\}$  mm when  $d < 300$  mm,
- $\pm (0.025d-r-6J)$  mm when  $d > 3GQ$  mm.

Where, d being the dimensions in millimeters for diameter, length or creepage distance as the case may be,

However, no negative tolerance shall be applicable to creepage distance.

#### 3.4 Interchangeably:-

The composite Insulators including the end fitting connection shall be of standard design suitable for use with the hardware fittings of any make conforming to relevant IEC/IS standards.

### 3.5 **Corona and RI Performance:-**

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 be end specified limit under the operating conditions.

### 3.6 **Maintenance:-**

3.6.1 The composite Insulators offered shall be suitable for use of hot line maintenance technique so that usual hot line operation can be carried out with ease, speed and safety.

## 4. **BASIC FEATURES::**

### 4.1 **Design and construction:-**

The composite insulator shall have a core, housing & weather shed of insulating material and steel/aluminum alloy hardware components for attaching it to the support/conductor.

#### 4.1.1 **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 or Boron free E-Glass 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 Pollution process. The FRP rod shall be void free.

#### 4.1.2 **Housing (Sheath):-**

The FRP rod shall be covered by a seamless sheath of a silicone electrometric compound or silicon alloy compound of a thickness of 3mm minimum.

It should protect the FRP rod against environmental influences, external pollution and humidity. It shall be extruded or directly molded on the 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 shall be free from voids.

#### 4.1.3 **Weather sheds:-**

The composite polymer weather sheds made of silicone electrometric compound or silicon alloy shall be firmly bonded to the sheath, vulcanized to the sheath or molded as part of the sheath and shall be free from imperfections. The weather sheds should have silicon 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.

**4.1.4 End Fittings:-**

End fittings 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. They shall be connected to the rod by means of a controlled compression technique. The gap between fitting and sheath shall be sealed by a flexible silicone electrometric compound or silicone alloy compound sealant. System of attachment 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 IS: 2486 / IEC: 60120.

**5. WORKMANSHIP::**

- 5.1 All the materials shall be of latest design and conform to the best engineering practices adopted in the high voltage field. Bidders shall offer only such Insulators as are guaranteed by them to be satisfactory and suitable for continued good service in power transmission lines.
- 5.2 The design, manufacturing process and material control at various stages shall be such as to give maximum working load, highest mobility, best resistance to corrosion, good finish and elimination of sharp edges and corners.
- 5.3 The design of the Insulators shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to deterioration.
- 5.4 The core shall be sound and free of cracks and voids that may adversely affect the Insulators.
- 5.5 Weather sheds shall be uniform in quality. They shall be clean, sound, smooth and shall be free from defects and excessive flashing at parting lines.
- 5.6 End fittings shall be free from cracks, seams, shrinks, air holes and rough edges. End fittings should be effectively sealed to prevent moisture ingress; effectiveness of sealing system must be supported by test documents. All surfaces of the metal parts shall be perfectly smooth with out projecting points or irregularities, which may cause corona. All load bearing surfaces shall be smooth and uniform so as to distribute the loading stresses uniformly.
- 5.7 All ferrous parts shall be hot dip galvanized to give a minimum average coating of zinc equivalent to 610 gm/Sq.m, or 87 $\mu$  m thickness and shall be in accordance with the requirement of IS: 4759, The zinc used for galvanizing shall be of purity 99.5% as per IS: 4699, The zinc coating shall be uniform, adherent, smooth, reasonably bright continuous and free from imperfections such as flux, ash rust stains, bulky white deposits and blisters. The galvanized metal parts shall be guaranteed to withstand at least four successive dips

each lasting for one H) minute duration under the standard preece test. The galvanizing shall be carried out only after any machining.

## **6. EQUIPMENT MARKING::**

6.1 Each insulator unit shall be legibly and indelibly marked with the following details as per IEC-61109:

- (b) Month & Year of manufacture
- (b) Min. failing load/guaranteed mechanical strength in kilo Newton followed by the word 'KN' to facilitate easy identification.
- (c) Manufacturer's name/Trade mark

6.2 One 10mm thick ring or 20 mm thick spot of suitable quality of paint shall be marked on the end fitting of each composite long rod of particular strength in case of 33 kV Insulators for easy identification in case both types of Insulators are procured by the utility. The paint shall not have any deteriorating effect on the insulator performance. Following codes shall be used as identification mark:

- For 45 kN long rod unit : Blue
- For 70 kN long rod unit : Red (Not applicable)

## **7. BID DRAWINGS::**

7.1 The Bidder shall furnish full description and illustration of the material offered.

7.2 The Bidder shall furnish along with the bid the outline drawing (3 copies) of each insulator unit including a cross sectional view of the long rod insulator unit. The drawing shall include but not be limited to the following information:

- (a) Long rod diameter with manufacturing tolerances
- (b) Minimum Creepage distance with positive tolerance
- (c) Protected creepage distance
- (d) Eccentricity of the long rod unit
  - (i) Axial run out
  - (ii) Radial run out
- (e) Unit mechanical and electrical characteristics
- (f) Size and weight tongue & clevis
- (g) Weight of composite long rod unit.
- (h) Materials
  - (i) Identification mark
  - (ii) Manufacturer's catalogue number

7.3 The bidder shall submit full dimensioned manufacturing insulator drawings containing all the details in four (4) copies along with copies of all the type tests.

7.4 After placement of award the Supplier shall also submit fully dimensioned insulator crate drawing for different type of Insulators for approval of the owner.

**8. TESTS AND STANDARDS::**

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 design & type test reports submitted shall not be more than 05 years old.

**8.1 Design tests:-**

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

**8.2 Type Tests:-**

The following type tests shall be conducted on a suitable number of individual insulator units, components, materials or complete strings:

8.2.1 The bidder shall submit type test reports as per IEC 61109 along with the bid. Additional type tests as required below shall be carried out by the manufacturer, after

SN	Description of type test	Ten procedure/standard
1.	Dry lightning impulse withstand voltage test	As per IEC 61109 (clause 6.1)
2.	Wet power frequency test	As per IEC 61 109 (clause 6,2)
3.	Mechanical load-time test	As per IEC 61 109 (clause 6 4)
4.	Radio interference test	As per IEC 61109 (clause 6.4)
5.	Recovery of Hydrophobicity test	Annexure-A I This test may be repeated every 3 yrs by the manufacturer
6.	Chemical composition test for silicon content	Annexure-A I Or any other test method acceptable to the owner
7.	Brittle fracture resistance test	Annexure - A I

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.

8.2.2 It shall be the option of the owner to accept the Insulators based on type test reports submitted by the manufacturer. The owner shall be free to repeat the type test & may witness the same.

**Note:** The owner, for the purpose of facilitating the type tests, may ask the bidders to quote test charges separately

8.2.3 All the type test given in Clause No. 8.2 in addition to routine & acceptance test shall be carried out on insulator along with hardware fittings wherever required.

**8.3 Acceptance (sample) Tests****8.3.1 For Composite Insulators**

- (a) Verification of dimensions : Clause 7.2 IEC: 61109,  
 (b) Verification of the locking system : Clause 7.3 IEC: 61 109  
 applicable)  
 (c) Galvanizing test : IS:2633/IS:6745  
 (d) Verification of the specified : Clause 7.4 IEC: 611 09,  
 mechanical load

#### 8.4.1 Routine Tests:-

sn	Description	Standard
1	Identification of marking	As per IEC: 61 109 Clause 8.1
2	Visual Inspection	As per IEC 61 109 Clause 8.2
3	Mechanical routine test	As per IEC: 61 109 Clause 8.3

#### 8.5 Tests During Manufacture

Following tests shall also be carried out on all components as applicable

- a) Chemical analysis of zinc used for galvanizing  
 b) Chemical analysis, mechanical, metallographic test and magnetic particle inspection for malleable castings.  
 c) Chemical analysis, hardness tests and magnetic particle inspection for forgings.

#### 8.6 Sample Batch for Type Testing

- 8.6.1 The bidder shall offer material for sample selection for type testing only after getting Quality Assurance Programme approved by the Owner, The bidder shall offer at least three times the quantity of materials required for conducting all the type tests for sample selection. The sample for type testing will be manufactured strictly in accordance with the Quality Assurance Programme approved by the Owner,

#### 8.7 Additional Tests:-

- 8.7.1 The Owner reserves the right at his own expenses, for carrying out any other test(s) of reasonable nature carried out at Supplier's premises, at site, or in any other place in addition to the aforesaid type, acceptance and routine tests to satisfy himself that the material comply with the Specifications.
- 8.7.2 The Owner also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Supplier's premises or at any other test center. In case of evidence of non compliance, it shall be binding on the part of the Supplier to prove the compliance of the items to the technical specifications by repeat

tests or correction of deficiencies or replacement of defective items, all without any extra cost to the Owner,

#### 8.8 **Co-ordination for Testing:-**

8.8.1 The Supplier shall have to co-ordinate testing of Insulators with hardware fittings to be supplied by other Supplier and shall have to guarantee overall satisfactory performance of the Insulators with the hardware fittings.

#### 8.9 **Quality assurance plan:-**

8.9.1 The successful bidder shall submit following information to the owner:

8.9.1.1 Test certificates of the raw materials and bought out accessories.

8.9.1.2 Statement giving list of important raw materials, their grades along with names of sub-suppliers for raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in presence of bidder's representative.

8.9.1.3 List of manufacturing facilities available.

8.9.1.4 Level of automation achieved and lists of areas where manual processing exists.

8.9.1.5 List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

8.9.1.6 List of testing equipments available with the bidder for final testing of equipment along with valid calibration reports.

8.9.1.7 The manufacturer shall submit Manufacturing Quality Plan (MQP) for approval & the same shall be followed during manufacture and testing,

8.9.2 The successful bidder shall submit the routine test certificates of bought out raw materials / accessories and central excise passes for raw material at the time of inspection.

#### 8.10 **Guarantee:-**

The Supplier of Insulators shall guarantee overall satisfactory performance of the Insulators for the period of 18 months from the date of supply.

#### 8.11 **Test Reports:-**

8.11.1 At least three copies of type test reports shall be furnished. One copy shall be returned duly certified by the owner, only after which the commercial production of the concerned material shall start

8.11.2 Copies of acceptance test reports shall be furnished in at least three [3] copies. One copy shall be returned duly certified by the Owner, only after which the material shall be dispatched.

8.11.3 Record of routine test reports shall be maintained by the Supplier at his works for periodic inspection by the Owner's representative.

8.11.4 Test certificates of test during manufacture shall be maintained by the Supplier. These shall be produced for verification as and when desired by the Owner.

## 9 **INSPECTION::**

9.1 The Owner's representative shall at all times be entitled to have access to the works and all places of manufacture, where insulator, and its component parts shall be manufactured and the representatives shall have full facilities for unrestricted inspection of the Supplier's and sub-Supplier's works, raw materials, manufacture of the material and for conducting necessary test as detailed herein.

9.2. The material for final inspection shall be offered by the Supplier only under packed condition. The Owner shall select samples at random from the packed lot for carrying out acceptance tests. The lot offered for inspection shall be homogeneous and shall contain Insulators manufactured in 3-4 consecutive weeks.

9.3 The Supplier shall keep the Owner informed in advance of the time of starting and the progress of manufacture of material in their various stages so that arrangements could be made for inspection.

9.4 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested unless the inspection is waived off by the owner in writing. In the later case also the material shall be dispatched only after satisfactory testing specified herein has been completed.

9.5 The acceptance of any quantity of material shall in no way relieve the Supplier of his responsibility for meeting all the requirements of the specification and shall not prevent subsequent rejection, if such material are later found to be defective.

## 10 **PACKING::**

10.1 All Insulators shall be packed in strong corrugated box of min, 7 ply duly palletted or wooden crates. The gross weight of the crates along with the material shall not normally exceed 100 Kg to avoid handling problem. The crates shall be suitable for outdoor storage under wet climate during rainy season.

10.2 The packing shall be of sufficient strength to withstand rough handling during transit, storage at site and subsequent handling in the field.

10.3 Suitable cushioning, protective padding, or dunnage or spacers shall be provided to prevent damage or deformation during transit and handling.

10.4 All packing cases shall be marked legibly and correctly so as to ensure safe arrival at their destination and to avoid the possibility of goods being lost or wrongly dispatched on

account of faulty packing and faulty or illegible markings. Each wooden case/crate/corrugated box shall have all the markings stenciled on it in indelible ink.

- 10.5 The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**

**SCHEDULE-II (B)****TECHNICAL SPECIFICATION FOR COMPOSITE INSULATORS  
FOR USE IN 11 KV SYSTEM****1.0 SCOPE::**

This specification covers design, manufacture, testing and supply of composite Insulators for use in the 11KV overhead transmission lines and substations. The composite Insulators shall be of the following type:

- i) Long rod Insulators for conductors in tension application at angle/cut points. The Insulators shall be **of tongue & Clevis type.**

**2.0 APPLICABLE STANDARDS::****2.1 Standards:-**

Following Indian/International Standards, which shall mean latest revision, with amendments/changes adopted and published, unless specifically stated otherwise in the Specification, shall be referred while accessing conformity of Insulators with these specifications.

- 2.1.1 In the event of supply of Insulators conforming to standards other than specified, the Bidder shall confirm in his bid that these standards are equivalent or better to those specified. In case of award, salient features of comparison between the standards proposed by the Bidder and those specified in this document will be provided by the Supplier to establish equivalence.

SNo.	Indian Standard	Title	International Standard
1		Definition, test methods and acceptance criteria for composite Insulators for A.C. overhead lines above 1000V.	IEC:1109
2	IS:2071	Methods of High Voltage Testing.	IEC:60060-1
3	IS:2486	Specification for Insulator fittings for overhead power lines with a nominal voltage greater than 1000V General Requirements and Tests Dimensional Requirements locking devices.	IEC:60120 IEC:60374
4		Thermal Mechanical performance test and mechanical performance test on string Insulators units	IEC:60575
5		Characteristics of string Insulator units of the long rod type.	IEC:60433
6		Hydrophobicity Clarification Guide.	STRI guide 1.92/1
7		Radio interference characteristics of overhead power lines and high voltage equipment.	CISPR18-2 Part 2
8	IS:8263	Methods of RI Test of HV Insulators	IEC:60437

SNo.	Indian Standard Standard	Title	International Standard
9		Standard for Insulators – Composite-Distribution Dead - end type.	ANSI-C29.132-2000
10	IS:4759	Hot dip zinc coatings on structural steel & other allied products.	ISO:1459
11	IS:2629	Recommended practice for Hot Dip galvanization for iron and steel	ISO:1461(E)
12	IS:6745	Determination of weight of zinc coating on zinc coated Iron and steel articles.	ISO:1460
13	IS:3203	Methods of testing of local thickness of electroplated coatings.	ISO:2178
14	IS:2633	Testing of Uniformity of coating of zinc coated articles.	
15		Standard specification for glass fiber standards.	ASTM D 578-05
16		Standard specification for compositional analysis by Thermogravimetry.	ASTM D 578-05
17	IS:4699	Specification for refined secondary zinc	

### 3.0 TECHNICAL DESCRIPTION OF COMPOSITE INSULATORS::

#### 3.1 Service condition:-

The polymer Insulators to be supplied shall be suitable for satisfactory continuous operation under conditions as specified below:

(i)	Maximum temperature of air in shed	49°C
(ii)	Minimum temperature of air in shed	-3°C
(iii)	Maximum relative humidity	95% (The humidity some time approaches saturation point)
(iv)	Minimum relative humidity	10 %
(v)	Average number of dust-storm days per annum	40 days
(vi)	Average number of rainy days per annum	90 days
(vii)	Number of months of tropical monsoon conditions per annum	3 months
(viii)	Average annual rainfall	1250 mm
(ix)	Maximum wind pressure	150 Kg / Sq. mm
(x)	Altitude not exceeding	1000 metres
(The limit of ambient temperature shall be 49°C peak and 38°C average over a period of 24 hours)		

#### 3.2 Composite Insulators long rod type for tension locations:-

3.2.1 The Insulators shall be suitable for 3  $\Phi$ , 50 Hz, effectively earthed 11kV O/H distribution system in a moderately polluted atmosphere. Long rod Insulators shall be of tongue & clevis type.

3.2.2 Bidder must be an indigenous manufacturer and supplier of composite Insulators of rating 11kV or above OR must have developed proven in house technology and manufacturing process for composite Insulators of above rating OR possess technical collaboration/ association with a manufacturer of composite Insulators of rating 11 kV or above. The Bidder shall furnish necessary evidence in support of the above along with the bid, which can be in the form of certification from the utilities concerned, or any other documents to the satisfaction of the owner.

3.2.3 Insulators shall have sheds with good self-cleaning properties. Insulator shed profile, spacing, projection etc, and selection in respect of polluted conditions shall be generally in accordance with the recommendation of IEC-60815/IS: 13134.

3.2.4 The size of Composite insulator, minimum creepage distance and mechanical strength along with hardware fittings shall be as follows:

SN	Type of composite Insulator	Nominal system voltage kV (rms)	Highest system voltage kV (rms)	Visible discharge test voltage kV(rms)	Wet power frequency withstand voltage kV (rms)	Impulse withstand voltage kV (rms)	Minimum creepage distance (mm)	Min. failing load KN	Pin ball shank diameter (mm)
i.	Long Rod Insulators	11	12	9	35	75	240	45	16

**Note:** Creepage distances have been considered in line with IS-13134 (which specifies **20mm/ kV for moderately polluted environment**).

### 3.3 Dimensional Tolerance of Composite Insulators :-

The tolerances on all dimensions e.g. diameter, length and creepage distance shall be allowed as follows in line with-IEC 61109:

$\pm \{0,04d+1.5\}$  mm when  $d < 300$  mm,

$\pm (0.025d-r-6J)$  mm when  $d > 300$  mm.

Where, d being the dimensions in millimeters for diameter, length or creepage distance as the case may be,

However, no negative tolerance shall be applicable to creepage distance.

### 3.4 Interchangeably:-

The composite Insulators including the end fitting connection shall be of standard design suitable for use with the hardware fittings of any make conforming to relevant IEC/IS standards.

**3.5 Corona and RI Performance:-**

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.

**3.6 Maintenance:-**

3.6.1 The composite Insulators offered shall be suitable for use of hot line maintenance technique so that usual hot line operation can be carried out with ease, speed and safety.

**4. BASIC FEATURES::****4.1 Design and construction:-**

The composite insulator shall have a core, housing & weather shed of insulating material and steel/aluminum alloy hardware components for attaching it to the support/conductor.

**4.1.1 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 or Boron free E-Glass 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 Pollution process. The FRP rod shall be void free.

**4.1.2 Housing (Sheath):-**

The FRP rod shall be covered by a seamless sheath of a silicone electrometric compound or silicone alloy compound of a thickness of 3mm minimum.

It should protect the FRP rod against environmental influences, external pollution and humidity. It shall be extruded or directly molded on the 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 shall be free from voids.

**4.1.3 Weather sheds:-**

The composite polymer weather sheds made of silicone electrometric compound or silicon alloy shall be firmly bonded to the sheath, vulcanized to the sheath or molded as part of the sheath and shall be free from imperfections. The weather sheds should have silicon 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.

**4.1.4 End Fittings:-**

End fittings 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. They shall be connected to the rod by means of a controlled compression technique. The gap between

fitting and sheath shall be sealed by a flexible silicone electrometric compound or silicone alloy compound sealant. System of attachment 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 IS: 2486 / IEC: 60120.

## **5. WORKMANSHIP::**

- 5.1 All the materials shall be of latest design and conform to the best engineering practices adopted in the high voltage field. Bidders shall offer only such Insulators as are guaranteed by them to be satisfactory and suitable for continued good service in power transmission lines.
- 5.2 The design, manufacturing process and material control at various stages shall be such as to give maximum working load, highest mobility, best resistance to corrosion, good finish and elimination of sharp edges and corners.
- 5.3 The design of the Insulators shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to deterioration.
- 5.4 The core shall be sound and free of cracks and voids that may adversely affect the Insulators.
- 5.5 Weather sheds shall be uniform in quality. They shall be clean, sound, smooth and shall be free from defects and excessive flashing at parting lines.
- 5.6 End fittings shall be free from cracks, seams, shrinks, air holes and rough edges. End fittings should be effectively sealed to prevent moisture ingress; effectiveness of sealing system must be supported by test documents. All surfaces of the metal parts shall be perfectly smooth with out projecting points or irregularities, which may cause corona. All load bearing surfaces shall be smooth and uniform so as to distribute the loading stresses uniformly.
- 5.7 All ferrous parts shall be hot dip galvanized to give a minimum average coating of zinc equivalent to 610 gm/Sq.m, or  $87\mu$  m thickness and shall be in accordance with the requirement of IS: 4759, The zinc used for galvanizing shall be of purity 99.5% as per IS: 4699, The zinc coating shall be uniform, adherent, smooth, reasonably bright continuous and free from imperfections such as flux, ash rust stains, bulky white deposits and blisters. The galvanized metal parts shall be guaranteed to withstand at least four successive dips each lasting for one H) minute duration under the standard preece test. The galvanizing shall be carried out only after any machining.

## **6. EQUIPMENT MARKING::**

- 6.1 Each insulator unit shall be legibly and indelibly marked with the following details as per IEC-61109:

- (a) Month & Year of manufacture
- (b) Min. failing load/guaranteed mechanical strength in kilo Newton followed by the word 'KN' to facilitate easy identification.
- (c) Manufacturer's name/Trade mark

6.2 One 10mm thick ring or 20 mm thick spot of suitable quality of paint shall be marked on the end fitting of each composite long rod of particular strength in case of 33 kV Insulators for easy identification in case both types of Insulators are procured by the utility. The paint shall not have any deteriorating effect on the insulator performance. Following codes shall be used as identification mark:

For 45 kN long rod unit : Blue

## **7. BID DRAWINGS::**

- 7.1 The Bidder shall furnish full description and illustration of the material offered.
- 7.2 The Bidder shall furnish along with the bid the outline drawing (3 copies) of each insulator unit including a cross sectional view of the long rod insulator unit. The drawing shall include but not be limited to the following information:
- (a) Long rod diameter with manufacturing tolerances
  - (b) Minimum Creepage distance with positive tolerance
  - (c) Protected creepage distance
  - (d) Eccentricity of the long rod unit
    - (i) Axial run out
    - (ii) Radial run out
  - (e) Unit mechanical and electrical characteristics
  - (f) Size and weight tongue & clevis
  - (g) Weight of composite long rod unit.
  - (h) Materials
    - (i) Identification mark
    - (ii) Manufacturer's catalogue number

7.3 The bidder shall submit full dimensioned manufacturing insulator drawings containing all the details in four (4) copies along with copies of all the type tests.

7.4 After placement of award the Supplier shall also submit fully dimensioned insulator crate drawing for different type of Insulators for approval of the owner.

## **8. TESTS AND STANDARDS::**

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 design & type test reports submitted shall not be more than 05 years old.

**8.1 Design tests:-**

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

**8.2 Type Tests:-**

The following type tests shall be conducted on a suitable number of individual insulator units, components, materials or complete strings:

The bidder shall submit type test reports as per IEC 61109 along with the bid. Additional type tests as required below 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.

SN	Description of type test	Ten procedure/standard
1.	Dry lightning impulse withstand voltage test	As per IEC 61109 (clause 6.1)
2.	Wet power frequency test	As per IEC 61 109 (clause 6,2)
3.	Mechanical load-time test	As per IEC 61 109 (clause 6 4)
4.	Radio interference test	As per IEC 61109 (clause 6.4)
5.	Recovery of Hydrophobicity test	Annexure-A This test may be repeated every 3 yrs by the manufacturer
6.	Chemical composition test for silicon content	Annexure-A Or any other test method acceptable to the owner
7.	Brittle fracture resistance test	Annexure - A

**8.2.2 It shall be the option of the owner to accept the Insulators based on type test reports submitted by the manufacturer. The owner shall be free to repeat the type test & may witness the same.**

**Note:** The owner, for the purpose of facilitating the type tests, may ask the bidders to quote test charges separately

8.2.3 All the type test given in Clause No. 8.2 in addition to routine & acceptance test shall be carried out on insulator along with hardware fittings wherever required.

**8.3 Acceptance (sample) Tests****8.3.1 For Composite Insulators**

- |     |   |   |                         |
|-----|---|---|-------------------------|
| (a) | Verification of dimensions                      | : | Clause 7.2 IEC: 61109,  |
| (b) | Verification of the locking system (applicable) | : | Clause 7.3 IEC: 61 109  |
| (c) | Galvanizing test                                | : | IS:2633/IS:6745         |
| (d) | Verification of the specified mechanical load   | : | Clause 7.4 IEC: 611 09, |

**8.4.1 Routine Tests:-**

sn	Description	Standard
1	Identification of marking	As per IEC: 61 109 Clause 8.1
2	Visual Inspection	As per IEC 61 109 Clause 8.2
3	Mechanical routine test	As per IEC: 61 109 Clause 8.3

**8.5 Tests During Manufacture**

Following tests shall also be carried out on all components as applicable

- a) Chemical analysis of zinc used for galvanizing
- b) Chemical analysis, mechanical, metallographic test and magnetic particle inspection for malleable castings.
- c) Chemical analysis, hardness tests and magnetic particle inspection for forgings.

**8.6 Sample Batch for Type Testing**

- 8.6.1 The bidder shall offer material for sample selection for type testing only after getting Quality Assurance Programme approved by the Owner, The bidder shall offer at least three times the quantity of materials required for conducting all the type tests for sample selection. The sample for type testing will be manufactured strictly in accordance with the Quality Assurance Programme approved by the Owner,

**8.7 Additional Tests:-**

- 8.7.1 The Owner reserves the right at his own expenses, for carrying out any other test(s) of reasonable nature carried out at Supplier's premises, at site, to in any other place in addition to the aforesaid type, acceptance and routine tests to satisfy himself that the material comply with the Specifications.
- 8.7.2 The Owner also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Supplier's premises or at any other test center. In case of evidence of non compliance, it shall be binding on the part of the Supplier to prove the compliance of the items to the technical specifications by repeat tests or correction of deficiencies or replacement of defective items, all without any extra cost to the Owner,

**8.8 Co-ordination for Testing:-**

- 8.8.1 The Supplier shall have to co-ordinate testing of Insulators with hardware fittings to be supplied by other Supplier and shall have to guarantee overall satisfactory performance of the Insulators with the hardware fittings.

**8.9 Quality assurance plan:-**

- 8.9.1 The successful bidder shall submit following information to the owner:
  - 8.9.1.1 Test certificates of the raw materials and bought out accessories.
  - 8.9.1.2 Statement giving list of important raw materials, their grades along with names of sub-suppliers for raw materials, list of standards according to which the raw materials are

tested. List of tests normally carried out on raw materials in presence of bidder's representative.

8.9.1.3 List of manufacturing facilities available.

8.9.1.4 Level of automation achieved and lists of areas where manual processing exists.

8.9.1.5 List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

8.9.1.6 List of testing equipments available with the bidder for final testing of equipment along with valid calibration reports.

8.9.1.7 The manufacturer shall submit Manufacturing Quality Plan (MQP) for approval & the same shall be followed during manufacture and testing,

8.9.2 The successful bidder shall submit the routine test certificates of bought out raw materials / accessories and central excise passes for raw material at the time of inspection.

**8.10 Guarantee:-**

The Supplier of Insulators shall guarantee overall satisfactory performance of the Insulators for the period of 18 months from the date of supply.

**8.11 Test Reports:-**

8.11.1 At least three copies of type test reports shall be furnished. One copy shall be returned duly certified by the owner, only after which the commercial production of the concerned material shall start

8.11.2 Copies of accepts nee test reports shall be furnished in at least three [3] copies. One copy shall be returned duly certified by the Owner, only after which the material shall be dispatched.

8.11.3 Record of routine test reports shall be maintained by the Supplier at hi^ works for periodic inspection by the Owner's representative.

8.11.4 Test certificates of test during manufacture shall be maintained by the Supplier. These shall be produced for verification as and when desired by the Owner.

**9 INSPECTION::**

9.1 The Owner's representative shall at all times be entitled to have access to the works and all places of manufacture, where insulator, and its component parts shall be manufactured and the representatives shall have full facilities for unrestricted inspection of the Supplier's and sub-Supplier's works, raw materials, manufacture of the material and for conducting necessary test as detailed herein.

- 9.2. The material for final inspection shall be offered by the Supplier only under packed condition. The Owner shall select samples at random from the packed lot for carrying out acceptance tests. The lot offered for inspection shall be homogeneous and shall contain Insulators manufactured in 3-4 consecutive weeks.
- 9.3 The Supplier shall keep the Owner informed in advance of the time of starting and the progress of manufacture of material in their various stages so that arrangements could be made for inspection.
- 9.4 No material shall be dispatched from its point of manufacture before it has been satisfactorily inspected and tested unless the inspection is waived off by the owner in writing. In the later case also the material shall be dispatched only after satisfactory testing specified herein has been completed.
- 9.5 The acceptance of any quantity of material shall in no way relieve the Supplier of his responsibility for meeting all the requirements of the specification and shall not prevent subsequent rejection, if such materials are later found to be defective.
- 10 **PACKING::**
- 10.1 All Insulators shall be packed in strong corrugated box of min, 7 ply duly palletted or wooden crates. The gross weight of the crates along with the material shall not normally exceed 100 Kg to avoid handling problem. The crates shall be suitable for outdoor storage under wet climate during rainy season.
- 10.2 The packing shall be of sufficient strength to withstand rough handling during transit, storage at site and subsequent handling in the field.
- 10.3 Suitable cushioning, protective padding, or dunnage or spacers shall be provided to prevent damage or deformation during transit and handling.
- 10.4 All packing cases shall be marked legibly and correctly so as to ensure safe arrival at their destination and to avoid the possibility of goods being lost or wrongly dispatched on account of faulty packing and faulty or illegible markings. Each wooden case/crate/corrugated box shall have all the markings stenciled on it in indelible ink.
- 10.5 The bidder shall provide instructions regarding handling and storage precautions to be taken at site.

**(SANJEEV P. PURANIK)**  
**CHIEF GENERAL MANAGER (PUR)**

**SCHEDULE-III (C)****GUARANTEED TECHNICAL PARTICULARS OF 45 KN, COMPOSITE POLYMER INSULATORS LONG ROD TYPE) SUITABLE FOR T&C TYPE HARDWARES**

(To be filled and kept in envelops containing Technical Offer)

Sl. No.	Description	11KV, 45 KN	33KV, 45 KN
1.	Name of Manufacturer		
2.	Address:		
	(a) registered Office		
	(b) Factory		
3.	Type of Insulators		
4.	Standard specification to which the Insulators manufactured and tested		
5.	Name of material used in manufacture of the Insulator (with class / grade)		
(a)	Material of core rod		
(b)	Material of Housing & weather sheds (silicon content by weight)		
(c)	Material of end fittings : tongue/clevis		
(d)	Sealing compound for end fitting		
6.	Colour Glaze of Insulator		
7.	<b>Electrical Characteristics:</b>		
(a)	Nominal system Voltage (KV rms)		
(b)	Highest System Voltage (KV rms)		
(c)	Dry power frequency withstand (KV rms)		
(d)	Wet power frequency withstand (KV rms)		
(e)	Dry flash over voltage (KV rms)		
(f)	Wet flash over voltage (KV rms)		
(g)	Dry lighting impulse withstand voltage		
	(a) Positive		
	(b) Negative		
(h)	Dry lighting impulse flashover voltage		
	(a) Positive (KV peak)		
	(b) Negative (KV peak)		
(i)	RIV at 1 MHz when energized at 10kV/30kV (rms) under dry condition (microvolt)		
(j)	Creepage distance (min) mm		
8.	<b>Mechanical Characteristics:</b>		
	Minimum failing load (KN)		
9.	<b>Dimensions of Insulator:</b>		
i.	Weight (Kg.)		
ii.	Dia of FRP rod (mm)		
iii.	Length of ERP rod (mm)		

Sl. No.	Description	11KV, 45 KN	33KV, 45 KN
iv.	Dia of weather sheds (mm)		
v.	Thickness of housing (mm)		
vi.	Dry arc distance (mm)		
10.	Dimensioned drawings of Insulator (including weight with tolerances in weight) enclosed.		
11.	Method of fixing of sheds to housing specify ):- single mould or modular construction (injection moulding/compression moulding)		
12.	No. of weather sheds		
13.	Type of sheds		
	(i) Aerodynamic		
	(ii) With under ribs		
14.	Packing details		
	(a) Type of packing.		
	(b) No. of Insulators in each pack		
	(c) Gross weight of package		
15.	Any other particulars which the bidder may like to give.		

PLACE:

DATE

SIGNATURE OF TENDERER

NAME IN FULL

DESIGNATION/ STATUS IN THE FIRM

COMPANY SEAL

**SCHEDULE-III (D)****GUARANTEED TECHNICAL PARTICULARS OF 11KV & 33KV COMPOSITE POLYMER PIN INSULATORS**

(To be filled and kept in envelops containing Technical Offer)

Sl. No.	Description	11KV	33KV
1.	Name of Manufacturer		
2.	Address:		
	(a) registered Office		
	(b) Factory		
3.	Type of Insulators		
4.	Standard specification to which the Insulators manufactured and tested		
5.	Name of material used in manufacture of the Insulator (with class / grade)		
(a)	Material of core rod		
(b)	Material of Housing & weather sheds (silicon content by weight)		
(c)	Material of end fittings : tongue/clevis		
(d)	Sealing compound for end fitting		
6.	Colour Glaze of Insulator		
7.	<b>Electrical Characteristics:</b>		
(a)	Nominal system Voltage (KV rms)		
(b)	Highest System Voltage (KV rms)		
(c)	Dry power frequency withstand (KV rms)		
(d)	Wet power frequency withstand (KV rms)		
(e)	Dry flash over voltage (KV rms)		
(f)	Wet flash over voltage (KV rms)		
(g)	Dry lighting impulse withstand voltage		
	(a) Positive		
	(b) Negative		
(h)	Dry lighting impulse flashover voltage		
	(a) Positive (KV peak)		
	(b) Negative (KV peak)		
(i)	RIV at 1 MHz when energized at 10kV/30kV (rms) under dry condition (microvolt)		
(j)	Creepage distance (min) mm		
8.	<b>Mechanical Characteristics:</b>		
	Minimum failing load (KN)		
9.	<b>Dimensions of Insulator:</b>		
i.	Weight (Kg.)		
ii.	Dia of FRP rod (mm)		

Sl. No.	Description	11KV	33KV
iii.	Length of ERP rod (mm)		
iv.	Dia of weather sheds (mm)		
v.	Thickness of housing (mm)		
vi.	Dry arc distance (mm)		
10.	Dimensioned drawings of Insulator (including weight with tolerances in weight) enclosed.		
11.	Method of fixing of sheds to housing specify ):- single mould or modular construction (injection moulding/compression moulding)		
12.	No. of weather sheds		
13.	Type of sheds		
	(i) Aerodynamic		
	(ii) With under ribs		
14.	Packing details		
	(a) Type of packing.		
	(b) No. of Insulators in each pack		
	(c) Gross weight of package		
15.	Any other particulars which the bidder may like to give.		

PLACE:

DATE

SIGNATURE OF TENDERER

NAME IN FULL

DESIGNATION/ STATUS IN THE FIRM

COMPANY SEAL

**SCHEDULE-IV****DETAILS OF TYPE TEST REPORT SUBMITTED**

SN.	Item	Rating	Particulars of type test	Ref. of IS specification	Date of conducting type test	Place of Carrying out type test
1.	33 KV Polymer Pin 10 KN, Silicon Composite Insulators	33 KV 10 KN				
2	11 KV Polymer Pin 5 KN, Long Rod Silicon Composite Insulators	11 KV 5 KN				
3	33 KV Polymer Disc Insulators	33 KV				
4	11 KV Polymer Disc 45 KN, Long Rod Silicon Composite Insulators	11 KV 45KN				
5	11 KV Post Insulators (6.6 KN)	11KV 6.6 KN				
6	33 KV Post Insulators (10 KN)	33 KV 10 KN				

PLACE:

DATE

SIGNATURE OF TENDERER

NAME IN FULL

DESIGNATION/ STATUS IN THE FIRM

COMPANY SEAL

**SCHEDULE- V**  
**SCHEDULE OF QUESTIONNAIRE**  
**PART "A"**  
**GENERAL INFORMATION**  
**(TO BE KEPT IN THE ENVELOPE PART-II**  
**"(COMMERCIAL/TECHNICAL BID)"**

- (i) Strike off, whichever is not applicable.  
(ii) Separate sheets should be used, wherever necessary.

1. Name & Address of the Bidder :
2. Name & Address of the firm/  
Company etc. :
  - a) Registered office :
  - b) Factory/works address :
  - c) e-mail(s) :
  - d) Fax no(s) :
  - e) Téléphone Nos. :
3. Confirm whether tenderer is a  
Manufacturer :
4. Manufacturer to give the  
Following particulars :
  - a) HAS QUOTED FOR WHICH WHICH ITEMS  
IN THIS TENDER; ALSO HOW MUCH  
QUANTITY OF EACH ITEM HAS HE QUOTED  
FOR. **(This is mandatory pl. give details here)**  
*Do not write 'as per price bid' as reply here* :
  - b) Year of starting manufacture :
  - c) Whether same/similar  
Materials manufactured earlier,  
(If yes, give reference) :
  - d) Yearly/monthly production capacity:
  - e) Maximum yearly production :

Achieved so far.

5. Whether the firm is an MP SSI Unit : Yes/No  
a) If yes, write registration No. :  
b) Whether documentary evidence Regarding registration enclosed. :  
c) Items of registration :  
d) Period of Registration :  
e) Furnish latest copy of Competency/certificate : Yes/No
6. A) whether the bidder has Supplied the tendered items To MPSEB/ MP Discoms in the past. : Yes/No  
b) If yes, whether documentary Evidence with details of orders Received & executed during last Five years, enclosed. :
7. Whether the tendered items Supplied to other SEBs / Govt. Utilities Give details of orders Received & executed during last Five years. :
8. Whether the tendered items Under the Enquiry have been Manufactured in the past. Give Name of SEBs / Discoms to which supplied Enclosing order copy in support. :
9. Any other information that Bidder may like to give in Order to highlight his bid. :

PLACE:

DATE:

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME IN FULL  
DESIGNATION/STATUS

**SCHEDULE-V**  
**PART "B": COMMERCIAL INFORMATION**  
**(TO BE KEPT IN THE ENVELOPE PART-II,**  
**"COMMERCIAL/TECHNICAL BID")"**

(i) Strike off, whichever is not applicable.

(ii) Separate sheets should be used, wherever necessary.

1. I) Earnest Money details : Bank draft/Bankers cheque/  
Cash with Sr.AO,MPSEB,  
Bhopal.

ii) Amount of EMD & full details : Rs.

iii) If exempted, state : SSI Unit of M.P./Small  
Whether the bidder is Scale unit registered  
With NSIC/Fully owned  
State/Central Govt.Unit.

iv) Whether reference of documentary : Yes/No  
Evidence regarding exemption  
Enclosed.

2. Whether the offer is valid : Yes/No  
For 180 days from the date (If no, state validity  
Of opening of commercial/ period).  
technical bid.

3. State whether the quoted :  
prices are **FIRM**.

4. MODE OF DESPATCH : By Rail/By Road

NOTE: Despatch by Road is acceptable  
to the Company only when the tenderer agrees:-

- i) to supply the material on door delivery basis  
and through bank approval road Transporter, and
- ii) for payment after receipt of material in good  
condition.

5. DISCOUNT:-

i) Whether any rebate/discount :  
is offered

ii) If yes, whether the rebate is :  
unconditional /conditional

iii)Rate/amount of rebate/discount :

- iv) If conditional state condition :
6. PAYMENT TERMS:-  
Whether Company's terms of payment is acceptable to the tenderer. : Yes/No
7. DELIVERY PERIOD:-
- a) Whether agreeable for Commencement of supplies from the date of order. : Yes/No
- b) Whether agreeable for Completion of supply within four months thereafter . :
8. PENALTY CLAUSE:-  
Whether agreeable to Company's penalty clause. : Agreed
9. GUARANTEE PERIOD:  
Whether agreeable to Company's Guarantee clause : Agreed
10. SECURITY DEPOSIT:-  
Whether agreeable to furnish Company's Standard security deposit @ 10% of value of order, for faithful execution of the order & to cover performance guarantee period. : Agreed
11. Indicate State, Central Sales Tax Registration Number (Please note that in case of non-registration with Sales Tax Central Department Purchase Tax as admissible shall be deducted by the Purchaser from the bills of the supplier. : State
12. Whether photocopy of the clearance from the Income Tax & Sales Tax Dept. and profit & loss Account and Turn over for last 5 years up to the last financial year have been enclosed. : Yes/No
13. EXTENSION ORDER:-  
Whether you are agreeable to accept extension order for 50% quantity on the same rates, terms & condition, if any extension order is placed within 6 months : Yes/No

from the date of placement of  
detailed order.

14. Whether rates offered are  
applicable for part quantities  
also.

: Yes/No

PLACE :

DATE :

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME IN FULL  
DESIGNATION/STATUS

**SCHEDULE- V**  
**PART "C" TECHNICAL INFORMATION**  
**(TO BE KEPT IN THE ENVELOPE PART-II**  
**"COMMERCIAL/ TECHNICAL BID")**

- (i) Strike off, whichever is not applicable.  
(ii) Separate sheets should be used, wherever necessary.

1. a) Whether material offered is exactly as per the technical specification : Yes/No.
- b) If not, give details of technical deviation (information may be given in deviation schedule given with documents for this purpose) :
2. Whether the copies of orders received during last 5 years from other State Electricity Boards/ State Discoms / NTPC and from other organizations. for the item under Enquiry. : Yes/No give details.
3. Whether performance certificate from such organisations regarding supplies enclosed. : Yes/No give details.
4. Whether pamphlets/technical details literatures alongwith drawing etc. furnished with the offer. : Yes/No give details.
5. Whether the tenderer agrees to furnish TYPE TEST REPORTS and material test certificates in respect of physical properties from Govt./ Govt. Lab. with each batch of supplies. : Yes/No.
6. Whether the tenderer has furnished details of manufacturing process and short history of plant. : Yes/No.
7. a) Whether all testing facilities for conducting Routine & Acceptance :

tests are available, if so, give details of facilities.

- b) Whether agreeable for inspection : Yes/No  
by Company's representative or authorized third party prior to dispatch and bear the testing charges for all tests as per relevant standards (give full details if test to be conducted and reference of relevant Standard specification).

PLACE :

DATE :

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME IN FULL  
DESIGNATION/STATUS

**UNDERTAKING**

I \_\_\_\_\_ Sole proprietor/partner of M/s \_\_\_\_\_  
\_\_\_\_\_ is giving undertaking that detail given are  
correct to the best of my knowledge and I agree to abide by all your tender/order  
terms and conditions.

PLACE:

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM

DATE:

NAME IN FULL  
DESIGNATION/STATUS

**SCHEDULE-VI**  
**PART "A": SCHEDULE OF PAST EXPERIENCE**  
**(TO BE KEPT IN THE ENVELOPE PART-II,**  
**"COMMERCIAL/TECHNICAL BID")**

Bidder's Name & Address:

To,

The Chief General Manager(Pur)  
M.P. Madhya Kshetra Vidyut Vitaran Co.Ltd.,  
Nishtha Parisar, Govindpura,  
BHOPAL-462023

Dear Sir,

Sub: - Performance/past experience.

We furnish herewith the record of our performance and experience as follows:-

S. No.	Purchaser's Name & Address	Order No. & Date	Ordered Qty. (Rating-wise) (Nos.)	Qty.supplied (Rating-wise) (Nos.)	Value of Order
1.	2.	3.	4.	5.	6.

PLACE:

DATE:

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME IN FULL  
DESIGNATION/STATUS

**Note:- Photocopy of the orders & performance reports received from other State Electricity Boards/Govt.undertakings etc. should be enclosed.**

**SCHEDULE-VI**  
**PART "B": SCHEDULE OF COMMERCIAL DEVIATIONS**  
**(TO BE SUBMITTED ONLINE ONLY)**

Bidder's Name & Address:

To,

The Chief General Manager(Pur),  
M.P. Madhya Kshetra Vidyut Vitaran Co.Ltd.,  
Nishtha Parisar, Govindpura,  
BHOPAL-462023

Dear Sir,

Sub: - Commercial Deviation.

The commercial Deviations & variations to the specifications stipulated in the tender, for the item quoted are, as under:-

S. No.	Condition	Clause No. of Enquiry document	Page No. of Enquiry document	Statement of deviations and variations.
1.	2.	3.	4.	5.

2. Except aforesaid deviations, the entire order, if placed, on us shall be executed in accordance with your specifications and any other conditions, variations/deviations etc. if found, elsewhere in our offer should not be given any considerations while finalizing the tender.

PLACE:

DATE:

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME IN FULL  
DESIGNATION/STATUS

**Note:- Continuation sheet of like size & format may be used as per bidder's requirements and shall be annexed to this schedule.**

**SCHEDULE-VI**  
**PART "C": SCHEDULE OF TECHNICAL DEVIATIONS**  
**(TO BE KEPT IN THE ENVELOPE PART-II,**  
**"COMMERCIAL/TECHNICAL BID")**

Bidder's Name & Address:

To,

The Chief General Manager(Pur),  
M.P. Madhya Kshetra Vidyut Vitaran Co.Ltd.,  
Nishtha Parisar, Govindpura,  
BHOPAL-462023

Dear Sir,

Sub: - Technical Deviations.

The Technical Deviations & variations to the specifications stipulated in the tender, for the item quoted are as under:-

S. No.	Condition	Clause No. of Enquiry document	Page No. of Enquiry document	Statement of deviations and variations.
1.	2.	3.	4.	5.

2. Except aforesaid deviations, the entire order, if placed, on us shall be executed in accordance with your specifications and any other conditions, variations/deviations etc. if found, elsewhere in our offer should not be given any considerations while finalising the tender.

PLACE:

DATE:

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME IN FULL  
DESIGNATION/STATUS

**Note:- Continuation sheet like size & format may be used as per bidder's requirements and shall be annexed to this schedule.**

**SCHEDULE-VII**

**(To be kept in the envelope Part-II, Commercial/Technical Bid)**

**SOURCE OF PROCUREMENT OF MATERIALS**

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S.No.	Source of procurement of raw material	Place of manufacture	Place of testing & inspection
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DATE:  
PLACE:

SIGNATURE OF TENDERER  
WITH SEAL OF FIRM  
NAME:  
DESIGNATION: