

**JAIPUR VIDYUT VITARAN NIGAM LIMITED
OFFICE OF THE SUPERINTENDING ENGINEER (PROC)
OLD POWER HOUSE PREMISES, NEAR RAM MANDIR, BANIPARK, JAIPUR-6
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SPECIFICATION FOR SUPPLY

OF

- i) 11 KV GUY INSULATORS
ii) 33 KV GUY INSULTORS
III) LT PIN INSULATORS
IV) LT SHACKLE INSULATORS**

AGAINST TENDER NOTICE NO. JPD/ SE(Proc)/ SPO.III/ TN-4329

Last Date of receipt of tenders	21.04.2011 upto 2:30 PM
Date of opening of tenders	21.04.2011 at 3:00 PM
Cost of Specification	Rs. 2500.00 (Rs. Two Thousand Five Hundred only)
Validity	120 days from the next day of opening of bid.
Earnest Money	Rs. 2,00,000.00 (Rs. Two Lac only) / Exemption Certificate / Vendor Registration Of Class " C " Category
Tendered Quantity	11 KV Stay Insulators-343658 Nos.
	33 KV Stay Insulators-17085 Nos.
	LT Pin Insulators- 1052366 Nos.
	LT Shackle Insulators- 290721 Nos.

Note : The bidders in their own interest are advised to go through the complete specification carefully.

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Note:- The bidder, in their own interest, are requested to read very carefully Section-I (Instruction to bidders), Section-II (General Condition of Contract) & Section-III (Technical Specification) before filling the bid. The Bid documents can be downloaded from JVVNL website www.jaipurdiscom.in. No hard copy of the bidding documents will be provided to the bidders through this office. In case of any discrepancy found in bidding documents downloaded from the website and appended with the bid (as a bid document) and original copy of such document available in the office of Superintending Engineer (Proc.), Jaipur Discom, Jaipur then the copy available with Superintending Engineer (Proc.), Jaipur Discom, Jaipur will be considered as final document for all purpose. The cost of Bid document as published in NIT shall be furnished along with downloaded bid document in the manner prescribed in bid document.

SECTION-III

TECHNICAL SPECIFICATION FOR PORCELAIN 11 KV & 33 KV GUY (STAY) INSULATORS, LT PIN INSULATORS AND LT SHACKLE INSULATORS FOR 11 KV & 33 KV SUB TRANSMISSION AND L.T.DISTRIBUTION OVERHEAD POWER LINES UNDER TN-4329

1.0 SCOPE :

1.1 This section provides for design, manufacture, inspection & testing before dispatch, supply and delivery of Porcelain 11 KV Guy (Stay) insulators, 33 KV Guy (Stay) insulators, L.T. Pin Insulators and LT shackle Insulators specified herein for their satisfactory use and operation on various 11 KV and 33KV sub-transmission & L.T. distribution overhead power lines of the state.

1.2 It is not the intent to specify completely herein all the details of the design and construction of equipment. However, the equipment shall conform in all respect to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation up to the bidder's guarantee, in a manner acceptable to the purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which in his judgment is not in accordance therewith. The offered equipment shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of bidder's supply irrespective of whether those are specifically brought out in this specification and / or the commercial order or not.\

2.0 CLIMATIC CONDITIONS :

The insulators shall be suitable for being installed directly in air with stay wire of 11 KV & 33 KV and LT overhead power lines. These shall be therefore suitable for satisfactory operation under the tropical climatic conditions listed below :

i) Location	In the state of Rajasthan
ii) Maximum ambient air Temperature (deg.C)	50
iii) Maximum Temperature attainable to an object exposed to sun (deg.C)	60
iv) Minimum Ambient air Temperature (deg.C)	(-) 5.0
v) Average daily ambient air Temperature (deg.C)	40.0
vi) Maximum relative humidity (%)	100
vii) Average rainfall per annum (mm)	100-1000

viii) Average Number of rainy days per Annum	70
ix) Maximum altitude above mean sea level (meters)	1000
x) Isoceraunic level (Days/Annum)	40
xi) Maximum wind pressure (Kg / sq.m.)	195
xii) Seismic level	0.33 g

3.0 PRINCIPAL PARAMETERS :

3.1 The material shall conform to the following specific parameters :

S.N. Item	Specification
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1. Type of Installation	Outdoor
2. System Voltage	415 Volt (+10%, -15%)
3. System frequency	50 Hz, + 5%
4. Number of phases	Three
5. System of earthing	Solidly grounded.

3.2 Details of insulators :

3.2.1 The all type of Insulators shall be suitable for use on various 11 KV/33 KV and L.T. distribution Power lines in a moderately polluted atmosphere.

3.2.2 The 11 KV Guy (Stay) insulators shall of size 110x75x22mm having dimensions as per fig 2 and 33 KV Guy Insulators shall of size 140x85x25mm having dimensions as per fig.3 of IS:5300/1969 (latest amended).

3.2.3 The 11 KV/33KV Guy (Stay) insulators shall be brown glazed and conforming to IS:5300/1969 (Latest amended) in all respects.

3.2.3 The L.T. Pin insulators shall of size 100x70mm having dimensions as shown in Fig.1, type-1 of IS:1445/1977 (latest amended) whereas L.T.Shackle Insulators shall of size 90x75mm having dimensions as shown in fig.3, type-1 of IS:1445/1977 (Latest amended).

3.2.3 The L.T.Pin Insulators and L.T.Shackle Insulators shall be brown glazed and conforming to IS:1445 / 1977 (Latest amended) in all respects.

4.0 GENERAL TECHNICAL REQUIREMENTS :

4.1 The porcelain of Insulators shall be sound, free from defects, thoroughly vitrified and smoothly glazed.

4.2 The glaze of the insulators shall be brown in colour. The glaze shall cover the entire porcelain surface parts except those areas that serve as supports during firing or are otherwise required to be left unglazed.

- 4.3 The design of the insulator shall be such that the stresses due to expansion & contraction in any part of the insulator shall not lead to its deterioration.
- 4.4 The dimensions of guy strain insulators essential from the point of view of inter-changeability shall be in accordance with IS:5300/1969(latest amended).
- 4.5 The insulator shall be in one piece.
- 4.6 The Pin Insulators shall have a top groove and both type of insulators shall have dimensions as specified above.
- 4.7. The Pin Insulators shall be threaded to take mild steel pins having profile as shown in fig.5 of IS:1445/1977 (Latest amended). The Shackle Insulators shall have a 'U' strap or a pair of straps and a cotter pin or two bolts and nuts having threads in accordance with IS:4218 (Pt.VI)/1967 (latest amended). The thickness of hexagon nuts shall be in accordance with IS:1363 (Part-3/1984) (Latest amended).

5.0 INSULATOR CHARACTERISTICS :

A. The 11 KV & 33KV Guy (Stay) insulators shall have the electrical & Mechanical characteristics as given below:

	<u>11 KV</u>	<u>33KV</u>
1. Designation of insulator	B	C
2. Length (mm)	110	140
3. Diameter (mm)	75	85
4. Cable hole dia (mm)	22	25
5. Minimum failing load KN	53	88
6. Creepage distance	48	57
7. Dry one minute power frequency withstand voltage KV (rms)	22	27
8. Wet one minute power frequency withstand voltage KV (rms)	9	13

B. The L.T. Pin Insulators & L.T. Shackle Insulators shall have the electrical & Mechanical characteristics as given below:

1. Type of Insulator	<u>Pin Insulator</u>	<u>Shackle Insulator</u>
2. Size of Insulators (mm)	100x70	90x75
3. Dry power frequency withstand Voltage KV (rms)	23	23
4. Wet power frequency withstand Voltage KV (rms)	10	10
5. Power frequency puncture withstand voltage KV (rms)	1.3 x the actual dry flashover voltage.	
6. Min. failing load(KN)	3.5	11.5

6.0 IDENTIFICATION & MARKING :

6.1 Each insulator shall be legibly and indelibly marked to show the following:

- i) Name or trade mark of the manufacturer.
- ii) Month & Year of manufacture.
- iii) Minimum failing load in KN
- iv) ISI certification mark if any.
- v) Purchaser's Name i.e. JPD

6.2 Marking on porcelain shall be printed & shall be applied before firing.

6.3 Offer not complying the condition of marking shall be treated as non-responsive.

6.4 The insulators marked with ISI Certification Mark will be given preference

7.0 DRAWINGS & DOCUMENTATION :

7.1 The bidder shall furnish full description and illustrated catalogues of insulators offered alongwith the bid.

7.2 The bidder shall also furnish alongwith the bid the outline drawing of each insulator unit comply with relevant standard with latest amendment including cross-sectional view of the shell. The drawing shall include the following information :

- i) Shell diameter and unit spacing with manufacturing tolerance.
- ii) Weight of unit insulator.
- iii) Identification mark.
- iv) Manufacturer's catalogue number.
- v) Brief installation instructions.

8.0 TESTS :

8.1 TESTS BEFORE DESPATCH :

The insulators shall be subjected at contractor's works before dispatch, to the routine & acceptance tests given here under as per relevant IS with latest amendment.

8.2 ROUTINE TESTS :

These tests are to carried out to check various requirements of insulators which are likely to vary during production. The following tests shall be conducted / carried out on each insulator by the bidder at his works as per relevant IS with Latest amendment and he should furnish certificate / record thereof during pre-dispatch inspection:-

- i) Visual Examination

8.3 ACCEPTANCE TESTS :

These tests shall be carried out on the samples taken from the lot for the purpose of the acceptance of that lot and shall be carried out by the bidder in the presence of the purchaser's representative(s). The following tests should be conducted in the order given below as per relevant IS with latest amendment:

- | | |
|--------------------------------------|-----------------------------------|
| i) Verification of dimensions | ii) Temperature Cycle test |
| iii) Mechanical strength test | iv) Porosity Test |

8.4 TYPE TESTS :

8.4.1 The type tests to be conducted on at least two units **11 KV & 33 KV Guy Insulators** as per relevant IS:5300/1969 (latest amended). The following tests shall constitute the type tests and shall be conducted in the order given below :

- (i) Visual examination (clause 7.8)
- (ii) Verification of dimensions (clause 7.5)
- (iii) Dry one minute power frequency withstand test (clause 7.2)
- (iv) Wet one minute power frequency withstand test (clause 7.3)
- (v) Temperature cycle test (clause 7.6)
- (vi) Mechanical strength test (clause 7.4)
- (vii) Porosity test (clause 7.7)

8.4.2 The type tests to be conducted on atleast two units of **LT Pin insulators & LT Shackle insulator** as per relevant IS:1445/1977 (latest amended). The following tests shall constitute the type tests:

- (i) Visual examination (clause 8.4)
- (ii) Verification of dimensions (clause 8.5)
- (iii) Dry power frequency voltage withstand test (clause 8.6)
- (iv) Wet power frequency voltage withstand test (clause 8.7)
- (v) Temperature cycle test (clause 8.8)
- (vi) Mechanical failing load test (clause 8.9)
- (vii) Power frequency puncture withstand test (clause 8.10)
- (viii) Porosity test (clause 8.11)

However, the purchaser reserves the right to demand repetition of some or all the type tests in presence of purchaser's representative. For this purpose , the tenderer should indicate unit rate for carrying out such type tests. These test charges shall not be taken into consideration for bid evaluation.

9.0 SAMPLING :

The sampling procedure as laid down in IS:731/1971 with latest amended (For Guy Insulators) and IS 1445/1977 with latest amendment (For LT PIn Insulators and LT Shackle Insulators) shall be followed for carrying out specified acceptance tests.

10.0 TYPE TEST ON SAMPLES SELECTED FROM MATERIAL RECEIVED IN STORES FROM 1st OFFERED LOT :

10.1 The first lot offered shall not be less than 10 % of the ordered qty or 5000 Nos. of each type of Insulators whichever is less.

10.2 If the bidder has already got conducted the requisite type test from the first lot of material received in Nigam 's store against any previous / earlier tender of JVVNL and such Type Test reports are valid i.e not older than 3 years on the date of opening of Techno-Commercial Bids, then the requirement of conducting Mandatory Type Test on the sample selected from 1st Lot of supply received in Nigam's store is **RELAXED**. For this purpose date of conducting type test will be considered.

ALTERNATIVELY

In case the bidder do not meet above requirement than two sample of each type Insulators from the 1st lot of received in purchaser's store shall be selected and sealed in the presence of representative of supplier for getting it Type Tested at Govt. / Govt. approved / Govt. recognized / NABL accredited Laboratory / ILAC Accredited.

10.3 However, suppliers own lab shall not be considered for the purpose of type test reports. The selected and sealed sample for type test shall be identified by providing **Polycarbonate seals**. The transportation charges of sample from store to test house shall be borne by NIGAM, Whereas the charges incurred towards type test of the material at test house shall be borne by the supplier. The testing charges should be remitted through D.D. in favour of Test House. The name of the test house shall be intimated separately..

10.4 In case sample(s) from first lot fails in type tests then:

a) Supplier shall have to replace the full quantity of the respective inspected lot supplied to various stores which is lying unused.

b) For the quantity already utilized against the order in field a deduction of 30% (thirty percent) of F.O.R. destination price of the material supplied shall be made

c) Sample(s) from next lot shall be selected again for type test . All test charges incurred towards type test of the material for second time shall be borne by the Supplier for which the testing charges should be remitted through D.D. in favour of the Test House by the supplier with the 2nd inspection offer.

10.5 In case sample again fails in the type test then:

a) The quantity supplied/received in stores and lying unused in stores shall stand rejected and shall be lifted back by the supplier.

b) For the quantity already utilized against the order in field a deduction of 30% (thirty percent) of F.O.R. destination price of the material supplied shall be made

c) Further supplies shall not be accepted and order shall stand cancelled .

The various type tests as per relevant standards shall be conducted on each type of insulator.

11.0 TOLERANCE ON DIMENSIONS / TEST RESULTS :

As per IS:5300/1969 with latest amendments (For 11 KV & 33 KV Guy Insulators) . As per IS:1445/1977 with latest amendments (For LT Pin Insulators and LT Shackle Insulators) .

12.0 TESTS AT SITE :

The purchaser reserves the right to conduct all tests on each type of insulator after arrival at site and bidder shall guarantee test certificates figures under actual service conditions.

13.0 TESTING FACILITIES :

The bidder must indicate clearly about the various testing facilities for conducting various acceptance tests as well as routine tests as per relevant ISS as available at his works. In case no testing facilities are available at the bidder's works, particulars of the place where such testing is proposed to be conducted during course of inspection must be indicated.

14.0 INSPECTION :

14.1 All the tests as mentioned at Clause 8.2 & 8.3 above for pre-despatch inspection shall be conducted at the place of manufacturer unless otherwise especially agreed upon by the bidder and purchaser at the time of purchase. The bidder shall afford the inspection officer(s) representing the purchaser all reasonable facilities without charges, to satisfy him that the material is being furnished in accordance with this specification. The purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is a dispute regarding the quality of supply.

14.2 The inspection may also be carried out by the purchaser at any stage of manufacture / before despatch as per relevant standard.

14.3 Inspection and acceptance of any material under the specification by the purchaser, shall not relieve the bidder of his obligation of furnishing material in accordance with the specification and shall not prevent subsequent rejection if the material is found to be defective. The bidder shall keep the purchaser informed in advance, about manufacturing programme so that arrangements can be made for inspection.

14.4 The purchaser reserves the right to insist for witnessing the acceptance / routine testings of the bought out items.

14.5 The bidder shall give 15 days advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine tests. The inspection charges would be to the purchaser's account.

15.0 PACKING & FORWARDING :

15.1 Each type of Insulators shall be packed in grass & then bunch of 50Kg shall be packed in double gunny bags or single HDP bag but suitable for rough handling & transportation. The gross weight of each bag normally should not exceed 50 Kg.

15.2 The packing shall bear the appropriate marking of :

- i) Particulars of material
- ii) Quantity
- iii) Manufacturer's identification mark
- iv) Complete dispatch details such as name of consignee, destination etc.

16.0 DELIVERY SCHEDULE:

Delivery of Ordered material shall commence after one month from the date of receipt of detailed Purchase Order and will be **completed within Ten months including commencement period of one month in equal monthly installments for each type of insulator**. However, you can offer the material even earlier and at a higher/faster rate. Delivery will not be linked with either acceptance of type test reports or approval of drawings. The month of commencement and completion should be expressed precisely.

The tenderers are required to indicate the delivery schedule in the schedule attached with the Specification.

17.0 DELAY IN DELIVERY :-

The “**Delay in Delivery**” shall be governed as per **clause 1.24 of General Condition of Contract**

18.0 PRICES :

The prices quoted shall be **FIRM** The prices shall be quoted in Rs. per unit on F.O.R. destination basis in the manner detailed in schedule of Prices(Schedule-IV) indicating details of ex-works price, Excise Duty, Sales tax / VAT, freight & Insurance charges and Entry Tax, etc. for delivery at our stores.

19.0 TEST CHECKING OF MATERIAL AT STORES

The material received in the stores of the NIGAM shall be subjected to the test checking at stores before final acceptance of the material, the procedure for the same shall be as under :

19.1 SAMPLING

One sample out of each sub-lot / lot of 3000 Nos. or part thereof from each inspected lot of each type of insulators received in stores shall be selected for test checking of material and shall be got tested. The sample selection shall be done in the presence of supplier or his authorized representative for which 7 days notice shall be given to the supplier.

19.2 TESTS

The following tests shall be carried out on the above items :

- a) Visual Examination, verification of dimensions, Creepage Distance & marking.
- b) Mechanical strength test.
- c) Porosity test.
- d) Puncture Test

In case if the facility for conducting any of the above test(s) is not available at the NIGAM's CTL, the purchaser reserve the right to get such test (s) conducted at any independent NABL Test House.

i) For witnessing of the testing, clear 7 days notice shall be given to the supplier stating date, time & place where the test is to be conducted. The testing shall be started after identification / confirmation of sample by the representative of the supplier that sample selected for testing pertain from the lot supplied by them. In case the supplier does not attend for witnessing the testing, the testing shall be proceeded and completed and action be taken as per the contract.

ii) The CTL shall send copies of test reports to the purchaser, consignees and the supplier and Sr. Accounts Officer (CPC).

iii) Only those tests shall be conducted at CTL for which facility with CTL is available.

19.3 CRITERIA FOR ACCEPTANCE

In case of failure of any of sample (s) in any of the above tests, the material contained in the lot / sub-lot received in store to which the samples belong, shall be rejected. The rejected material shall have to be replaced by the supplier free of cost.

19.4 TEST CHARGES :

All test charges incurred towards test checking of the material received in our stores shall be borne by the NIGAM.

20.0 PAYMENT : The Payment shall be governed in accordance with the clause No. 1.42 of GCC with the following modifications :-

A) If bidder have submitted valid type test reports with bid:

The 100% payment shall be released after receipt of successful test reports from CTL for the mandatory test checking on the samples selected from the material received at stores against first lot and subsequent lot(s) in anticipation of successful type test reports.

B) If bidder have not submitted valid type test reports with bid:

i) The 70% payment shall be released after receipt of successful test reports from CTL for the mandatory test checking on the samples selected from the material received at stores against first lot and subsequent lot(s) in anticipation of successful type test reports.

ii) The balance 30% payment shall be released after receipt of successful type test reports on the samples selected from the material received in the stores.

C) The due dates for payment shall be considered from the date of submission of the bills along with receipted challans to Sr. Accounts Officer (CPC) of respective Discoms.

21.0 PLANT, MACHINERY & TESTING EQUIPMENTS;

21.1 The bidder should have required plant, machinery and testing equipment for manufacturing & testing of each type of insulators.

21.2 The bidders should furnish details of plant, machinery and testing equipment with the bids failing which bids may be ignored.

22.0 QUANTITY TOLERANCE :

Quantity tolerance of plus minus 2% of ordered quantity shall be allowed for completion of supply .