

**JAIPUR VIDYUT VITARAN NIGAM LIMITED
OFFICE OF THE SUPERINTENDING ENGINEER (PROC)
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**SPECIFICATION FOR SUPPLY OF 33 KV HORN GAP FUSE SETS WITH POST 2X24 KV
INSULATORS (UN-ASSEMBLED) & 11 KV HORN GAP FUSE SETS WITH 1X24 KV POST
INSULATORS (UN-ASSEMBLED) AGAINST TENDER NOTICE NO. JPD/SE/PROC./SPO-III/TN-
4335**

Last Date of receipt of tenders	28.04.2011 upto 2:30 PM
Date of opening of tenders	28.04.2011 at 3:00 PM
Cost of Specification	Rs. 2500.00 (Rs. Two Thousand Five Hundred only)
Validity	120 days from the next date of opening of techno-commercial bids
Earnest Money	Rs. 1,50,000.00 (Rs. One Lac fifty Thousand only) / Exemption Certificate / Vendor Registration Of Class " D " Category.
Tendered Quantity	33 KV Horn Gap Fuse Sets with P.I. -443 Sets 11 KV Horn Gap Fuse Sets with PI. -1448 Sets

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 SUPPLY OF 33 KV HORN GAP FUSE SETS WITH POST 2X24 KV INSULATORS (UN-ASSEMBLED) & 11 KV HORN GAP FUSE SETS WITH 1X24 KV POST INSULATORS (UN-ASSEMBLED) AGAINST TN-4335.****1.0 SCOPE :**

This specification covers the design, manufacture, testing before dispatch, packing & forwarding and delivery of 33 KV Horn Gap Fuses and 11 kV Horn Gap Fuses (including hardwares and post insulators). The Horn Gap Fuses shall be required for protection of lines and distribution Transformers at various sites of Jaipur Discom, the details of principal parameters/various parts of horn gap fuses are indicated in subsequent clauses hereunder.

1.1 It is not the intent to specify completely herein all details of the design and construction of equipments. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation upto the Bidder's guarantee in a manner acceptable to the Purchaser, who will interpret the meanings of drawings and specifications 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 its effective and trouble free operation along with associated equipments, interlocks , protection schemes etc. Such components shall be deemed to be within the scope of supply, irrespective of whether those are specially brought out in this specification and/or the commercial order or not.

2.0 SERVICE CONDITIONS :

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions :

i) Location	In the state of Rajasthan
ii) Max. ambient air temp. in shade (Deg.C)	50
iii) Min. ambient air temp. (Deg.C)	(-) 5
iv) Average daily ambient air temperature(Deg.C.)	45
v) Max. yearly weighted ambient temp.(Deg.C.)	35
vi) Relative humidity (%)	100
vii) Average annual rainfall (mm)	100 to 1000mm (depending upon area)
viii) No. of rainy days P.A.	70

ix)	Max. wind pressure (Kg/sq m)	195
x)	Max. altitude above mean sea level (mtrs)	1000
xi)	Isoceraunic level (month/year)	4 months (June to Sept)
xii)	Seismic level (horizontal acceleration)	0.08g

Note : Moderately hot and humid tropical climate conducive to rust and fungus growth. The climatic conditions are also prone to wide variations in ambient conditions. Smoke is also present in the atmosphere. Heavy lightning also occurs during June to October.

3.0 PRINCIPAL PARAMETERS :

3.1 The equipment i.e. horn gap fuse unit covered in this specification shall be a complete unit with 2 x 24 KV Post Insulator type E-32 for use on 33 kV system and 1X24 KV Post Insulator type E-32 for use on 11 kV system The ratings of 33 kV & 11 KV Horn Gap Fuses with post insulators shall be as under :

PARTICULARS/ RATINGS HG FUSES	Specified values (33 KV H.G.)	Specified values (11 KV H.G.)
a) Nominal system voltage kV (rms)	33	11
b) Rated voltage kV(rms)	36	12
c) Rated frequency(Hz)	50	50
d) One minute power frequency withstand voltage kV(rms) (To earth & between poles).	70	55
e) Impulse withstand voltage kV peak).(To earth & between poles).	170	125
f) Permissible temperature rise above ambient temp. (50 deg cent.)	40 deg. Cent.	40 deg. Cent.
g) Rated Current (Amp)	630	100

3.2 The minimum mechanical & electrical values/ characteristics of 24kV Post Insulators shall be as follows :

S. No.	Particulars	Specified values
1.	Torsional Strength	680mm
2.	Cantilever Strength	9000 N
3.	Tensile Strength	30000 N
4.	Compression Strength	40000 N
5	Highest system voltage (kV rms)	24

6.	Dry & wet power frequency withstand test voltage for one minute(kV rms)	55
7.	Impulse withstand test	125 (KV Peak)
8.	Visible discharge test	18 (KV rms)
9.	Power frequency puncture withstand test voltage (kV rms)	1.3 times the actual dry flash-over voltage of the unit.

3.3 DIMENSIONAL CHARACTERISTICS OF POST INSULATORS :

S.No.	Particulars.	2X24 kV (33 KV HG fuse)	1X24 KV (11KV HG Fuse)
1.	Nominal system voltage.	33 kV	11 KV
2.	No. of units	Two	One
3.	Total height of i) unit ii) Stack	254 mm 508 mm	254mm
4.	Diameter of Insulating part (max.)	210 mm	210mm
5.	Minimum total creepage distance of each unit	430 mm	430mm
6.	Top fitting pitch circle diameter	76 mm	76mm
7.	Bottom fitting pitch circle diameter	76 mm	76mm

3.4 One set of Horn Gap Fuse Shall consist of three single phase units of Horn Gap Fuses.

4.0 GENERAL TECHNICAL REQUIREMENTS :

4.1 HORN GAP FUSES :

4.2 The hardwares of horn gap fuses shall be designed and manufactured as per enclosed drawing. The horn gap fuse sets are to be used for protection of lines and distribution transformers. The bill of material to complete one set (i.e. for Three phases) shall be as per duly signed drawing No. JPD/SE/Proc./SPO-II/ HG enclosed with this specification.

4.3 The hardwares of Horn Gap Fuses shall be constructed out of the best quality of material suitable for weather conditions prevailing in Rajasthan. The workmanship shall be in accordance with the modern engineering practice. All ferrous parts shall be given an anticorrosive finish. The other parts shall be

substantially non corrosive. The details of various specific parts for manufacture are as under :

(1) BASE CHANNEL :

The base channel shall be of size 125mmX60mmx542 mm Long(for 33 KV HG Fuse sets) and 75X40x542 mm Long (for 11 KV HG Fuse sets) of **Hot Dip Galvanised** mild steel conforming to ISLC 75 of Tata Reference Book 1970 in case of 33 KV Horn Gap Fuses. The base channel should have holes for mounting post insulators as shown in the drawing enclosed with this specification and as per clause 4.1.2.

(2) HORN STOOL :

Two numbers of Horn Stools of **Hot Dip Galvanised** MS flat of size 50 x 6 mm as detailed in the drawing will be used. The Horn Stool shall be fixed on the top of the post insulators with the help of electro galvanised bolts and spring washers as shown in the drawing. The Horn Stool must be rigid and strong enough for fixing the horn over the top of horn stool, as shown in the drawing. Over the top of the horn stool, the horn will be fixed as shown in the drawing.

(3) ARCING HORN :

Two numbers arcing horns of 12 mm dia of **Hot Dip Galvanised** M.s. round rod will be used. It will be aluminum painted. The base of arching horns should be projecting to 25 mm as shown in drawing.. It shall be fitted on horn stool with the help of horn clamps, nuts, bolts and spring washers. The length of the horn/height should be maintained as shown in the drawing. The horn should have a hole & fixing brass thumb screw with fly nut and flat washer to tie and tighten the fuse wire as shown in the drawing.

(4) BRASS THUMB SCREW :

There shall be one tapped hole on each arcing horn as shown in the drawing. The brass thumb screw will be fixed in the tapped hole provided in each arcing horn. The fuse wire is to be tied with brass thumb screw and tightened with help of fly nut (Brass) and flat washer (Brass). The length of brass thumb screw will be fully threaded and screwed up to the whole depth of the horn. The design must be such that the changing of fuse wire is convenient. There is no loose connection/contact and there should not be any possibility of thumb/jamming on account of arcing when fuse is blown off.

(5) HORN CLAMPING ARRANGEMENT :

There shall be two M.S. Horn clamp of size 50x105x6 mm fixed on horn stool with the help of bolts and nuts, spring washers as shown in drawing for fixing the arcing horns and clamping the conductor. The lower part of the clamping for holding the required conductor shall be of size 50x50x6 mm as shown in drawing. This shall be made from M.S. sheet. The clamp for 33 KV horn gap fuse shall be suitable for ACSR "DOG".

(6) EARTHING TERMINAL :

One number earthing terminal shall be provided on the flange portion of base channel. The M.S bolt of 12 mm dia and 25 mm long shall be used with flat washer for this purpose.

(7) BOLTS, NUTS AND WASHERS :

All the bolts, nuts and washers shall be electro-galvanized. However the thumb screw and its connecting fly nut and flat washer, to be used to fix fuse wire, will be of brass only. The size of various bolts, nuts and washers which are in the scope of supply are as below :

S.NO.	SIZE OF BOLTS, NUTS AND WASHERS.	TO BE UTILISED FOR	qty. for 1 unit of 33 KV	qty. for 1 unit of 11 KV
1.	Bolt size 12mm dia, 25mm long with flat washer & nut.	Earthing terminal	4 Nos.	4 Nos
2.	Bolt size 12mm dia, 38mm long with nuts & spring washer.	For fixing post insulators on base.	8 Nos.	8 Nos
3.	Bolt size 12 mm dia, 25mm long with nuts spring washers.	For fixing horn stool above the post insulators.	4 Nos	4 Nos
4.	Bolt size 5/6 dia 1.25" long with nuts and spring washers.	For fixing arcing horn on horn stool and clamping	16 Nos.	16 Nos
5.	Brass thumb screw (6mm dia. 30mm long) with Brass fly nut (30mm wing dia) flat washer (1mm thick, 20mm outer dia and internal dia. such as to accommodate the 6mm dia brass screw).	For fixing fuse wire on the arcing horn.	2 Nos.	2 Nos.

5.0 POST INSULATORS :

5.1 The 24 kV post insulators units shall be pedestal post type (conforming to IS-5350 Part-III and IS-2544). The insulators shall be constructed out of the best quality of material suitable for weather conditions prevailing in Rajasthan. The workmanship shall be of the highest grade and the entire manufacture shall be in accordance with the modern Engineering practices.

5.2 Where Porcelain Insulators are offered, the insulator shall be made of homogeneous and vitreous porcelain of high mechanical and die-electric strength. It shall have sufficient mechanical strength to sustain electrical and mechanical loading on account of wind load, short circuit forces etc. Glazing of the porcelain shall be of uniform brown or dark brown colour with a smooth surface arranged to shed away rain water. The porcelain shall be free from laminations and other flaws or imperfections that might affect the mechanical or dielectric quality. It shall be thoroughly vitrified, tough and impervious to moisture. The porcelain and metal parts shall be assembled in such a manner and with such material that any thermal differential expansion between the metal and porcelain parts throughout the range of temperature specified in this specification shall not loosen the parts or create undue internal stresses which may affect the mechanical or electrical strength or rigidity of the unit as a whole or stack of two units. The assembly shall not have excessive concentration of electrical stresses in any section or across leakage surfaces. Cement used in the construction of post insulators shall not cause fracture by expansion or loosening by construction and proper care shall be taken to locate correctly the individual parts during cementing. The cement used shall not give rise to chemical reaction with metal fittings and its thickness shall be uniform. The insulator shall be suitable for water washing by rain or artificial means in service condition. Profile of the insulator shall also conform to the relevant IS.

5.3 Cap to be provided on top of the insulator shall be of malleable steel casting or of aluminum alloy. It shall be machine finished and hot dip galvanized in case of malleable steel casting. The cap of 24 kV Post Insulators shall have four numbers of tapped holes spaced on a pitch circle diameter of 76mm. The threads of the tapped holes in the post insulator metal fittings shall be cut after giving anti corrosion protection and shall be protected against rust by greasing or other similar means, all other threads shall be cut before giving anticorrosion protection and shall conform to IS:4218 or latest version thereof. The tapped holes shall be suitable for bolts with threads having anticorrosive protection. The effective depth of threads shall not be less than the nominal diameter of the bolt. The cap shall be so designed that it shall be free from visible corona.

5.4 The casting shall be free from blow holes, cracks and such other defects.

5.5 All the ferrous metal parts shall be given an anticorrosive finish and shall be hot dip galvanized smoothly as per IS:3638 (as amended upto date), IS:2633 or any other equivalent authoritative standard. The other parts shall be substantially non corrosive. The material shall be galvanized only after shop operations upon it have been completed. The metal parts before galvanizing should be thoroughly cleaned of any paint, grease, rust, scales or alkali or any foreign deposit which are likely to come in the way of galvanizing process. The coating on the metal parts shall withstand minimum four one minute dips in copper sulphate solution as per the relevant IEC/IS.

5.6 The insulator unit shall be assembled in a suitable jig to ensure correct positioning of the top and bottom metal fittings relative to one another. The faces of the metal fittings shall be parallel and at right angles to the axis of the insulator and the corresponding holes in the top and the bottom metal fittings shall be in a vertical plane containing the axis of the insulator.

5.7 It shall be the sole responsibility of the Supplier to carry out thorough inspection and quality checks on the insulators at the insulator supplier's works, before offering the insulators for Purchaser's inspection.

5.8 Two Nos. of 2 x 24 kV Post Insulator shall be provided on each pole of 33 kV Horn Gap Fuse set (Total six Nos. of 2 x 24 kV Post Insulator for three phases (Poles) of one set of H.G.) Two Nos. of 1 x 24 kV Post Insulator shall be provided on each pole of 11 kV Horn Gap Fuse set. (Total six Nos. of 1 x 24 kV Post Insulator for three phases (Poles) of one set of H.G.)

5.9 The porcelain and hardware surface coming in contact with cement shall be coated with bituminous paint for cushioning to relieve mechanical stress caused by temperature variation and cement expansion.

5.10 The post insulators shall conform to IS:5350. The total creepage distance of 24 kV post insulator as individual unit shall be minimum 430 mm.

5.11 Following makes of the Post Insulators shall be acceptable for the supply of Horn gap Fuse Set

- i) M/s.Jaipur Glass & Potteries, Jaipur.
- ii) M/s.India Potteries, Kolkata.
- iii) M/s.Bikaner Ceramices, Bikaner.

- iv) M/s.CJI Porcelain, Khurja.
- v) M/s.Vishal Melleable, Ankeleshwar.
- vi) M/s.Allied Ceramices Pvt. Ltd., Kolkata.
- vii) M/s.WSI, Chennai.
- viii) M/s.IEC, Bhopal.
- ix) M/s.MIL, Allahabad.
- x) M/s.Jay Shree Insulators, Vadodara.
- xi) M/s.Birla NGK Insulators Pvt. Ltd., Halol.
- xii) M/s.MIL, Abu Road.
- xiii) M/s.Sarvana Insulators Ltd., Kurinji Padi, Dist Cuddalore, (Tamilnadu).
- xiv) M/s B.H.E.L.

5.12 Besides above, the Post Insulators manufactured by the vendors approved by the Power Grid Corporation of India Ltd (PGCIL) and National Thermal Power Corporation (NTPC) shall also be acceptable.

6.0 TESTS :

6.1 TEST BEFORE DESPATCH :

The parts of H.G.Fuses i.e. Hardwares and post insulators shall be subject to under mentioned tests separately at respective manufacturer's works before dispatch as per relevant standards.

INSULATORS :

A) Routine test

- i) Visual examination
- ii) Routine electrical test
- iii) Routine mechanical test

B) TYPE TESTS

- i) Visual examination
- ii) Verification of dimensions
- iii) Visible discharge test
- iv) Impulse voltage withstand test.
- v) Dry power-frequency voltage withstand test.
- vi) Wet power frequency voltage withstand test.
- vii) Temperature cycle test.
- viii) Mechanical strength :
 - a) Bending Test
 - b) Torsion Test.
 - c) Tensile or compressive test.
- ix) Puncture test.
- x) Porosity test.
- xi) Galvanizing test.

C) Acceptance Tests :

- i) Verification of dimensions
- ii) Temperature cycle test
- iii) Mechanical strength test
- iv) Puncture test
- v) Porosity test
- vi) Galvanizing test

TEST ON HORN GAP FUSE UNIT COMPLETE WITH INSULATORS AND HARDWARES

A TYPE TEST (S) :

- i) Visual examination
- ii) Dimensional checkup
- iii) Temperature rise test
- iv) Power frequency H.V. Test, with inter phase distance as 1000 mm.(for 33 KV HG fuse set) and with inter phase distance as 600 mm.(for 11 KV HG fuse set)

- v) Impulse test. with inter phase distance as 1000 mm.(for 33 KV HG fuse set) and with inter phase distance as 600 mm.(for 11 KV HG fuse set)

B ACCEPTANCE TESTS :

- i) Visual examination
- ii) Dimensional checkup
- iii) Temperature Rise Test
On one sample per lot

6.2 TEST ON BOUGHT OUT ITEMS :

Tests are not required to be performed on small bought out parts like Nuts, Bolts & Washers etc. at the works of manufacturer. Furnishing of test certificates from original manufacturer(s) shall be deemed to be satisfactory evidence. Inspection of the tests at sub contractor's works will be arranged by the supplier when ever required.

6.3 ACCEPTANCE & ROUTINE TESTS :

6.3.1 All acceptance & routine tests as stipulated at clause No.6.1 shall be carried out in presence of purchaser's representative at manufacturer's works of Insulators and Hardwares separately before dispatch.

6.3.2 Immediately after finalization of the programme of type/acceptance, routine testing, the supplier shall give sufficient advance intimation to the purchaser to enable him to depute his representative for witnessing the tests.

The test samples after having withstood the routine tests shall be subjected to the following **Acceptance tests** in the order indicated below :

On Insulators

- i) Verification of dimensions as per approved drawing / ISS.
- ii) Temperature cycle test.
- iii) Mechanical strength test.
- iv) Puncture test.
- v) Porosity test
- vi) Galvanizing test

On Hardwares of Horn Gap Fuse sets

- i) Visual examination
- ii) Dimensional checkup
- iii) Temperature Rise Test (only on one unit per lot)

Fitment of Horn gap Fuse hardware with Insulator test

One percent of insulators inspected shall be brought at the contractor works for checking of fitment with hardware.

6.3.3 For conducting acceptance tests on post insulators the number of post insulators or post insulators unit shall be selected as under:-

Lot size	number of post insulators unit to be selected
Upto 800	6
801 to 1300	8
1301 to 3200	10
3201 to 8000	14
8001 and above	20

6.3.4 10% samples will be selected from offered lot of complete Horn Gap Fuse sets Hardware for conducting acceptance tests on the same except fitment test which shall be carried out on one percent of offered lot.

7.00 TYPE TEST CERTIFICATE:

- a) The bidder shall furnish valid and authenticated type test certificate from a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ ILAC i.e. International Laboratory Accredited laboratory / ILAC i.e International Laboratory Accrediation Cooperation (In case of foreign laboratory) of similar rating and design. Such type test certificates should not be older than three years as on the date of bid opening. For this purpose date of conducting type tests will be considered.
- b) The type test certificates by inhouse laboratory of tendering firm even if it is a Govt approved/ Govt recognized/ NABL accredited/ ILAC accredited,shall not be accepted, in case of their own tender. This will not apply if tendering firm is Govt. Company/ Public Sector Undertaking.
- c) The bidder should furnish documentary evidence in support of the laboratory whose type test have been furnished, that the said laboratory is a Govt/ a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ ILAC accredited (in case of foreign laboratory)
- d) The type test certificates shall be furnished either in original or duly attested by notary.
- e) The bids of only those bidders shall be considered to be meeting the type test criteria who furnishes complete type test certificates with the bid as per above provision.

f) However, in the following cases the bid of the bidder may be considered meeting the type test criteria if the bidder furnishes an undertaking stating that valid type test certificates from a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ ILAC accredited shall be furnished from first lot (without asking for any delivery extension) along with Bank Guarantee, with the technical bid from a Nationalized/ Scheduled Bank in prescribed proforma at Schedule-III C or DD/ Pay order amounting Rs. 1,50,000 (Rs. One lac Fifty Thousand Only). The initial validity of BG shall be 9 months with claim period of 3 months in addition

- i) Where a new Rajasthan based firm is participating & technically competent.
- ii) Where one or more type test(s) is/ are older than 3 years.
- iii) Where Rajasthan / Outside Rajasthan firm furnishes requisite type test reports of higher rating material

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.

During type tests the disconnecter shall be mounted on its own support structure or equivalent support structure and installed with its own operating mechanism to make the type tests representative.

8.0 TYPE TEST ON SAMPLES SELECTED FROM MATERIAL RECEIVED IN STORES FROM 1st OFFERED LOT (Applicable to Successful bidders who have not furnished valid type test certificate but furnished BG in lieu of Type Test)

The first lot offered shall not be less than 10 % of the ordered qty.

One sample of each type of Horn Gap Fuse sets from the 1st Lot received in purchaser's store shall be selected and sealed for getting it type tested at any Govt. approved/ Govt. recognized/ NABL accredited laboratory/ ILAC i.e. International Laboratory Accredited laboratory / ILAC i.e International Laboratory Accrediation Cooperation (In case of foreign laboratory). The transportation charges of sample(s) 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 the Test House by the supplier with the 1st inspection offer. The name of test house shall be intimated to successful bidder after issue of Purchase order.

At the option of the purchaser, the material received in the stores may be utilized in the field after receipt of successful test reports from CTL, Jaipur 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 report(s).

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

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

ii) 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.

iii) 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.

B) In case sample again fails in the type test then:

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

ii) 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.

iii) 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 Isolator.

9.0 INSPECTION :

All the tests (as mentioned at Clause 6.4) and Inspection shall be made 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 supplied 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.

The Inspection may be carried out by the purchaser at any stage of manufacture/ before dispatch as per relevant standard.

Inspection and acceptance of any material under the specification by the purchaser, shall not relieve the bidder of his obligation of supplying 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.

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

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 (Inspectors traveling , boarding & lodging) would be to the purchaser's account.

Calibration Certificates:

The supplier shall present the latest calibration certificate(s) of testing instruments / equipments to be used for the testing of the materials covered in the purchase order to the authorised inspecting officer/ inspecting agency of the purchaser. The testing instruments / meters/ apparatus etc. should be got calibrated by the supplier from time to time from independent laboratory accredited from NABL or the manufacturer of the testing instruments having tracibility to NPL or NABL accredited laboratory. The calibration certificates should not in any case be older than one year at the time of presenting the same to the inspecting officer/ inspecting agency of the purchaser. The testing instruments / equipments should be duly sealed by the calibrating agency and mention thereof shall be indicated in the calibration certificates(s).

10.0 QUALITY ASSURANCE PLAN :

10.1 The Bidder shall invariably furnish following information alongwith his offer, failing which his offer shall be liable for rejection. Information shall be separately given for Horn Gap fuses hardware unit and post insulators.

i) Statement giving list of important raw materials.

ii) Names of sub suppliers for the 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 Supplier's representative, and copies of test certificates.

iii) Information and copies of test certificates as in (i) and (ii) above in respect of bought out accessories.

iv) List of manufacturing facilities available.

v) Level of automation achieved and list of areas where manual processing still exists.

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

vii) List of testing equipments available with Bidder for final testing of equipment and test plant limitation if any, vis-a-vis the type, special, acceptance and routine tests specified in the relevant standards. These limitations shall be very clearly brought out in the specified test requirements.

10.2 The Supplier shall, within 30 days of placement of order shall submit following information to the Purchaser.

i) List of raw materials as well as bought out accessories and the names of sub-suppliers selected from the lists furnished alongwith offer.

ii) Type test certificates of the raw materials and bought out accessories.

iii) Quality Assurance Plan (QAP) with hold points for Purchaser's inspection. The quality assurance plan and hold points shall be discussed between the Purchaser and Supplier before the QAP is finalised.

11.3 The supplier shall submit the routine test certificates of bought out accessories and central excise passes for raw materials at the time of routine testing.

11.0 DRAWING :

11.1 The one set of following drawings/documents of the equipment covered by this specification shall be furnished by the Bidder alongwith their offer:-

i) Outline dimensional drawings of Horn Gap Fuse Set with insulator and list mentioning bill of material with complete details regarding metal hardware fittings.

ii) Assembly drawings showing complete details of all parts and separating mechanism and mass of main component part.

iii) Drawings showing dimension of upper and lower metal parts along with PCD of post insulator.

iv) Descriptive literature and manufacturing data on insulator shall be furnished.

v) Type test reports (as per Clause 6.2 of Section-VII).

vi) Test reports, literature, pamphlets of the bought out items and raw materials.

vii) Detailed views of the insulator stacks & metallic and hardware unit.

11.2 The Supplier shall within 2 weeks of placement of order shall submit 3 sets of final versions of all the above said drawings along with bill of material, as per bidding documents , for purchaser's approval. The purchaser shall

communicate his comments / approval on the drawing(s) to the supplier within two weeks. The supplier shall, if necessary, modify the drawings and resubmit 3 copies of the modified drawings within two weeks for purchaser's approval. The delay in submission of the modified drawings (if called for) complete in all respect and in acceptable form beyond two weeks time (as stated above), shall be on supplier's account.

11.3 The manufacturing of the equipment shall be strictly in accordance with the approved drawings and no deviation shall be permitted without the written approval of the Purchaser. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawing shall be at the Supplier's risk.

11.4 Approval of drawings/work by Purchaser shall not relieve the Supplier of his responsibility and liability for ensuring correctness and correct interpretation of the latest revision of applicable standards, rules and codes of practices.

12.0 PACKING AND FORWARDING :

12.1 Each Horn Gap Fuse Set Hardwares shall be legibly and indelibly marked to show the following :

- a) Name or trade mark of manufacturer.

The Post Insulators shall be legibly and indelibly marked to show the following :

- a) Name or trade mark of manufacturer.
- b) Month and year of manufacture.

Such marking on porcelain shall be printed, not embossed and shall be applied before firing.

12.2 The Horn Gap Fuse sets (hardwares) shall be suitably packed in double gunny bags worthy of rail/ road transport . The supplies shall have to insert in each case / bag packing list giving item wise details of articles in the packing as mentioned in the list. The post insulators shall be packed in crates suitable for vertical/ horizontal transport as the case may be and suitable to withstand handling during transport and outdoor storage during transit. The Supplier shall be responsible for any damage to the equipment during transit due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbols.

Wherever necessary, proper arrangement for lifting, such as lifting hooks etc., shall be provided. Any material found short inside the packing cases shall be supplied by Supplier without any extra cost.

The inspected lot of Post Insulators should be directly delivered / dispatched from their (manufacturer's) works to consignee's stores.

12.3 Each consignment shall be accompanied by a detailed packing list containing the following information :

- a) Name of the consignee.
- b) Details of consignment.
- c) Destination.
- d) Total weight of consignment.
- e) Handling and unpacking instructions.
- f) Bill of material indicating contents of each package.

13.0 QUANTITY AND DELIVERY REQUIREMENTS :

The scope of supply shall include a supply of 1% extra quantity of bolts, nuts, washers, and such other small loose items free of cost.

14.0 DELIVERY SCHEDULE

The delivery of quoted quantity should be completed in **seven months** period including commencement period of maximum 30 days. In case ordered quantity is different than quoted quantity, then monthly delivery shall be adjusted proportionately. Tenders in which monthly delivery schedule is not indicated shall be ignored.

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

15.0 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 :

15.1 SAMPLING

One sample out of each sub lot/ lot of 50 sets for 33 KV Horn gap fuse sets and 100 sets for 11 KV Horn Gap fuse sets or part thereof from each inspected lot received in stores shall be selected from each store for test checking of material and shall be got tested. The selection of sample from the material received at stores shall be done as soon as material is received in stores without the presence of the representative of the supplier. However, testing of sample(s) at CTL or elsewhere as arranged by JVVNL shall be carried out in the presence of representative of the supplier after identification / confirmation by him that sample so selected belongs to them.

15.2 TESTS

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

- a) Visual examination , verification of dimensions, weight and marking as per PO/ GTP / approved drawing.

- b) Post Insulators :
 - i) Mechanical strength test.
 - ii) Porosity Test
 - iii) Puncture Test
- c) All galvanized parts. - Uniformity of galvanization test.

Testing of the material shall be got done at the test laboratory of the Nigam i.e. at CTL in the presence of the representative of the supplier. Only those test shall be conducted at CTL for which facility with CTL is available.

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.

15.3 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.

15.4 TEST CHARGES :

All test charges incurred towards test checking of the material received in our stores shall be borne by the NIGAM except that of personal expenses of the representative of the supplier for witnessing the tests.

16.00 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.

17.0 PRICE & PRICE VARIATION:

a) 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.

b) The quoted price shall be variable as per Price Variation formula given in this specification at Schedule-II without any ceiling. The base date of price variation shall be **1.03.2011** and shall be governed as per clause No.1.10. of Instructions to bidders. The offers in which prices have not been quoted in prescribed manner are liable to rejection.

c) If the price variation formula is changed, the same shall be applicable for the price variation. During the transit period when both old and new indices are being circulated, then the admissible Price Variation shall be applicable, which is advantageous to Nigam, and the period from which the old indices are discontinued then the P.V. shall be admissible with the new indices.

18.0 Quantity tolerance :

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