

**ELECTRICITY DEPARTMENT
GOVERNMENT OF PUDUCHERRY
PUDUCHERRY**

TENDER SPECIFICATION FOR MAINTENANCE FREE

11 KV RING MAIN UNIT SWITCHGEAR

UNDER TURNKEY BASIS.

TENDER SPECIFICATION NO.PED/EE-I/OT/01/2009

DUE DATE : 18/ 12/2009

OFFICE OF THE EXECUTIVE ENGINEER-I

ELECTRICITY DEPARTMENT

PUDUCHERRY-1

SECTION - I

BID QUALIFICATION REQUIREMENTS

The Bidders shall become eligible to Bid, on satisfying the following 'Bid Qualification Requirements' and on production of the required documentary evidences along with the Tender.

- 1. The Tenderer should have the experience of satisfactory Design, Manufacture, supply, erection, installation, testing & commissioning of at least 100 numbers Ring Main Units of SF6 gas insulated, SF6/Vacuum breaker within a period of 5 years as on the date of tender opening.**
2. The Tenderer should furnish documentary evidences for the requirements at Sl.No.1 above along with testimonials on the satisfactory performance of the contract.
3. A copy of the Type Test Certificates for the tests prescribed as per relevant ISS / IEC of latest issue obtained from a Govt.Lab/ Recognized laboratory / CPRI – Bangalore, dated not earlier than 5 years as on the date of Tender opening should be enclosed ..

THE OFFERS OF THE BIDDERS NOT SATISFYING THE ABOVE "BID QUALIFICATION REQUIREMENTS" WILL BE SUMMARILY REJECTED.

SECTION - II

REJECTION OF TENDERS:

- I. Tenders will be **SUMMARILY** rejected if:
- (a) The EMD requirements are not complied with.
 - (b) Not satisfying Bid qualification Requirement
 - (c) Type Test Certificate not enclosed with the Tender offer .
- II. Tender is **liable** to be rejected, if it is
- (a) Not covering the supply of equipments/ materials with all accessories specified.
 - (b) With validity period quoted is less than that specified in the Specification.
 - (c) Not in conformity with Department's Commercial terms and Technical Specifications.
 - (d) Not properly signed by the tenderer.
 - (e) The Xerox copy of the Tender Documents are not duly signed and stamped on each and every page
 - (f) Received "after due date and time"
 - (g) Received from a tenderer who is directly or indirectly connected with Department or services of Local Authority from those who have not purchased the copy of the specification.
 - (h) From any blacklisted Firm.
 - (i) From a tenderer whose past performance/vendor rating is not satisfactory.
 - (j) Offer received by Telex/Telegram./ FAX / E-Mail.
 - (k) not containing all the required particulars .
 - (m) Checklist as per schedule is not duly filled up and properly signed by the tenderer.
- III.** In the event of the documents furnished with the offer being found to be bogus or the documents contain false particulars, the EMD paid by the tenders will be forfeited in addition to blacklisting them for further tenders/ Contracts in Electricity Department , Puducherry.

**GOVERNMENT OF PUDUCHERRY
ELECTRICITY DEPARTMENT**

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Telephone No. 2339543 &
2336361 to 2336365
2222270 to 2222274
Ext. No.310

Office of the Executive Engineer-I, Electricity Department, Puducherry – 605 001.

Tender No. PED//EE-I/OT/01/09

Name of the work: "Design, Engineering, Manufacture, assembly, Stage testing, inspection and testing before supply and delivery at site, Erection, Installation, testing & Commissioning of Ring Main units outdoor type SF6 (with 2 numbers of Load break Isolators for 11 KV Incoming & Out going cables and 1 No. of SF6/Vacuum Breaker for Distribution Transformer) with combinations of 1 no RMU consisting of 1 Load Break Switch & 2 no of SF6/Vaccum Circuit Breakers.

Price : Rs.520.00
(Inclusive of sales tax)

To

Thiru./Messrs.

Serial No. :
Cash Receipt No. :
& Date.

Puducherry-605 001
|
Date.:

EXECUTIVE ENGINEER-
Electricity Department
Puducherry

SECTION-III

GOVERNMENT OF PUDUCHERRY ELECTRICITY DEPARTMENT

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INSTRUCTIONS TO THE BIDDER

1. Tenders in the prescribed form are hereby invited **on behalf of the President of India** for

“Design, Engineering, Manufacture, assembly, Stage testing, inspection and testing before supply and delivery at site, Erection, Installation, testing & Commissioning of Ring Main units outdoor type SF6 (with 2 numbers Load break Isolators for 11 KV Incoming & Out going cables and 1 No. of SF6/Vacuum Breaker for Distribution Transformer) with combinations of 1 no. RMU consisting of 1 No. of Load Break Switch & 2 Nos. of Vacuum /SF6Circuit Breakers at Mandi Yard in Puducherry Town.”

The RMUs should be provided with necessary take off terminal units for future automations and all these units are shielded in an outdoor metal body with a dielectric media of SF6 gas with provision of additional load break switches and circuit breakers extensible in future wherever required. Dismantling the existing 11KV Outdoor Oil RMU, Erecting the SF6 RMU on necessary concrete foundations and transporting all the dismantled items in as and where it is condition to the PED stores.

Supply, erection, installation, testing & commissioning of Terminations for the Incoming, Outgoing lines & Transformer Cables (RMU side & DT HV side). All the above said works are to be executed under **TURNKEY** basis including civil and earthing works.

2. Printed forms of tenders consisting of complete specifications, the schedule of quantities of the various classes of work to be done and the set of conditions of contract, can be purchased at the office of the EXECUTIVE ENGINEER-I, Electricity Department, Puducherry-605 001 on any working day between 09.00 and 16.00 hrs. except on Saturdays, Sundays and public holidays on payment of Rs.500/- in cash plus sales tax 4%. **The DD/Pay order shall be drawn in favour of the Drawing and Disbursing Officer, Division.I, Electricity Department, Puducherry.**

3. The site for the work is at Mandi RMU yard, Town Central Section, Puducherry Town.

4. Tenders which should always be placed in sealed cover with the name of the work written on the envelope will be received by the Executive Engineer-I, Electricity Department, Puducherry-605 001 upto 11 A.M. on 18-12-2009 and will be opened by him in his office on the same day at 15.30 Hrs. If the opening date happens to be holiday, the tenders will be opened on the next working day.

5. The time allowed for carrying out the work will be 60 days from the date of receipt of orders.
 6. The contractor should quote in figures as well as by the rates in both figures and words and amount tendered by them. Rates should be quoted in both, figures and words. In case of ambiguity between rates in figures and words, lower of the two will be taken for tender evaluation.
 7. Issue of tender forms will be stopped at 11.00 hrs. on 18-12-2009 .
 8. Earnest money amounting to 2% of the tendered value in receipted treasury challan/deposit receipt of a scheduled bank guaranteed by the Reserve Bank of India, must accompany the tender and the tender is to be sent in a sealed cover superscribed and addressed to the Executive Engineer-I, Electricity Department, Puducherry-605 001. The DD/Pay order shall be drawn in favour of the Drawing and Disbursing Officer, Division.I, Electricity Department, Puducherry.
 9. The contractor, whose tender is accepted will be required (unless exempted) to furnish by way of security deposit for the due fulfillment of his contract such sum as will amount to:-
 - i) 5% of the tendered value as security deposit.
 - ii) An amount equal to 5% of the tendered value as performance security.(Totally 10% of the tendered value)
- The security deposit and performance security will also be accepted in cash or in the form of Government securities. Fixed Deposit receipt and guarantee bonds of scheduled bank and State Bank of India will also be accepted for this purpose, provided confirmatory advice is forthcoming from the Reserve bank of India.
10. The acceptance of a tender will rest with the Executive Engineer-I, Electricity Department, Puducherry-605 001 who does not bind himself to accept the lowest tender, and reserves to himself the authority to reject any or all of the tenders received without the assignment of a reason. All tenders in which any of the prescribed conditions are not fulfilled on or incomplete in any respect are liable to be rejected.
 11. Canvassing in connection with tender is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
 12. All rates shall be quoted on the proper forms of the tender alone.

13. On acceptance of the tender the name of accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-charge shall be communicated to the Engineer-in-charge.
14. The undersigned does not bind himself to accept the lowest or any tender and reserves to himself the right of accepting to whole or any part of the tender and the tenderers shall be bound to perform the same at the rate quoted.
15. Sales Tax or any other tax on material in respect of this contract shall be payable by the contractor.
16. The contractor must produce Income Tax clearance certificate in the required form along with the tender.
17. No Engineer of Gazetted or other Gazetted Officer employed in Engineering of Administrative duties in an Engineering Department of the Government of India/Government of Puducherry/Any other State Government is allowed to work as a contractor for a period of two years of his retirement from Government Service without the previous permission of Government of India. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of Government of India as aforesaid before submission of the tender of engagement in the contractor's service.
18. The tender for works shall remain open for acceptance for a period of ninety days from the date of opening of tenders. If any tenderer withdraws his tender before the said period or makes any modification, in the terms and conditions of the tender which are not acceptable to the Department, then the Government shall without prejudice to any other right of remedy, be at liberty to forfeit the EMD.
19. Where the rate quoted by the contractor in figures and in words tally but the amount is not worked out correctly, the rate quoted by the contractor will be taken as correct and not the amount.
20. Tenderers are requested to furnish the exact location of their factories & Service centres with detailed postal address and pin code, telephone and Fax Nos. etc in their tenders so as to arrange inspection by the department, if considered necessary. The successful Tenderer should have the facility of Service Centre at Chennai/Puducherry.

21. DESTINATIONS-WHERE MATERIALS ARE REQUIRED:

The prices quoted should be on FOR Destination basis for delivery anywhere in the area under the jurisdiction of purchase organization.

22. INFORMATION REQUIRED AND CLARIFICATIONS:

22.1 In the process of examination, evaluation and comparison of tender offers, the DEPARTMENT may, at its discretion, ask the Tenderer for a clarification of his offers. All responses to requests for clarifications shall be in writing to the point only. No change in the price or substance of the offer shall be permitted.

22.2 The Tender offers shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award/rejection is made by the Tender Accepting Authority to the tenderers.

The Tenderers shall not make attempts to establish unsolicited and unauthorized contact with the Tender Inviting Authority, Tender Accepting Authority or Tender Scrutiny Committee after the opening of the tender and prior to the notification of the award and any attempt by any tenderers to bring to bear extraneous pressures on the Tender Accepting Authority shall be sufficient reason to disqualify the tenderer.

23. EVALUATION AND COMPARISON OF THE TENDER OFFERS:

23.1 The tenders will be evaluated strictly.

23.2 The tender offers received will be examined to determine whether they are in complete shape, all required Data have been furnished, properly signed and generally in order and conforms to all the terms and conditions of the Specification without any deviation.

24. For the purpose of evaluation of tender offers, the following factors will be taken into account for arriving the evaluated price:

- (a) The quoted price will be corrected for arithmetical errors.
- (b) In case of discrepancy between the price quoted in words and figures, lower of the two shall be considered.
- (c) The evaluated price will include Ex-works price, Excise Duty, freight & insurance and will also include sales tax etc.,
- (d) The amount of Sales Tax & Surcharge and percentage of Sales Tax & Surcharge shall be indicated in the offer.

25. VALIDITY:

25.1. The tender offer shall be kept valid for acceptance for a period of 90 days from the date of opening of offers.

25.2. Further, the tenderer shall agree to extend the validity of the Bids without altering the substance and prices of their Bid for further periods, if any, required by the DEPARTMENT.

26. RIGHTS OF THE DEPARTMENT:

26.1. Notwithstanding any thing contained in this Specification, the DEPARTMENT reserves the rights :

(a) to recover losses , if any, sustained by DEPARTMENT, from the supplier who pleads his inability to supply and backs out of his obligation after award of contract. The security deposit paid shall, be forfeited.

(b) to cancel the orders for not keeping up the delivery schedule.

(c) to accept the lowest tender.

(d) To revise the quantities at the time of placing orders.

(e) To reject any or all the tenders or cancel without assigning any reasons there for.

(f) to relax or waive or amend any of the conditions stipulated in the tender Specification wherever deemed necessary in the best interest of the DEPARTMENT.

26.2. The purchaser reserves the right to request for any additional information and also reserves the right to reject or accept the proposal of any tenderer, if in the opinion of the purchaser, the qualification data is incomplete or in the opinion of the purchaser, the bidder is found not qualified to satisfactorily perform the contract.

SECTION - IV

GENERAL TERMS AND CONDITIONS

I. Scope:- This section covers the general terms and conditions of this contract, for Design, Engineering, Manufacture, assembly, Stage testing, inspection and testing before supply and delivery at site, Erection, Installation, testing & Commissioning of Ring Main units outdoor type SF6 (with 2 numbers Load break Isolators for 11 KV Incoming & Out going cables and SF6/Vacuum Breaker for Distribution Transformer) with combinations of 1 No. RMU consisting of 1 No. of load break switch and 2 Nos. of SF6/Vacuum circuit breakers at MANDI RMUYARD in Puducherry Town.”

II. Visit of site by contractor:- The tenderer is advised to visit the site to acquaint himself with the site conditions, approaches, availability of raw materials camping facilities for his labour force, geological and weather conditions and all other relevant information required for tendering before submitting his tender.

III. Tender clarifications:- The tenderer shall note that if any clarifications regarding specifications, conditions of contract, schedule of quantities or scope of work are required, he should contact the office of the Executive Engineer-I, Electricity Department, Puducherry-605 001. No claim on account if any ambiguity in any respect will be entertained.

IV. Comparisons of the biddings:-

- a) The tenderers shall offer their bidding in the prescribed bidding schedule attached with this tender for all the activities mentioned therein.
- b) The quantities given under the bidding schedule of this tender are tentative. The Department reserves the right to order the final quantities, for which the unit rates quoted in the tender by the tenderer, shall be considered as valid.

V. completeness of the contract:- Any fittings or accessories which may not have been specifically mentioned in the specifications but which are usually necessary in the equipment of similar plant or for efficient working of the plant shall be deemed to be included in the contract and shall be provided by the contractor without extra charges. All plant and apparatus shall be completed in all details whether such details are mentioned in the specifications or not.

VI. Bidding:-

The tenderer must quote in quadruplicate the lump sum firm rates for all the activities described in bidding schedule without fail. If the bidding is done otherwise, it will be rejected straight away. The variation in the bidding rates will not be allowed on any ground such as mistake, misunderstanding etc. after the tender has been submitted.

VII. Award of work:- The tenderer shall either possess or engage a person who is in possession of Contractor 'A' grade licence issued by the Licensing Board of the Union Territory of Puducherry for erection and commissioning works.

VIII Standards:-

- a) Unless otherwise specified, all the materials/equipments and the work shall comply in all respects with the requirements of the specifications attached with this tender documents.
- b) Where necessary the successful tender will have to submit the design/drawings/test reports in respect of Electrical and Civil works to the Engineer-in-charge of the department for approval before taking up the works for execution.

IX. Line Clear:- Erection of line/structure/equipment near the existing electrical installations and modifications to the existing installation shall be carried out after obtaining proper line clear from Electricity Department authorities by the contractor of main representative. For such works (which require line clear) requisition for line clear indicating the date and duration shall be given at least three days in advance. The work has to be arranged and completed on the date and duration indicated by Electricity Department in the line clear which will be arranged depending on the power supply condition. Notwithstanding the above, if line clear is required to be returned by Engineer-in-charge at any stage of work, the work shall be stopped immediately and the line/equipment is to be made ready for charging and the line clear returned after clearing of all men and equipment employed for the work.

X. Place of manufacture & Inspection:- The tenderer shall state in his tender the places of manufacture, testing and inspection of the various portions of the works included in the contract, Authorized representatives of the department shall be present at the time of all tests and the tenderer shall provide all necessary facilities for the same. Representative of the purchaser shall

be entitled to access to the contractor or sub-contractor's work at any time during the working hours for the purpose of inspecting and testing the manufacture of materials, equipments and building plant.

XI. Failure to meet Guarantees and Requirement of specification:-

The factory tests or the operation of any piece of apparatus under service/conditions show that it does not meet the guarantees and/ or the requirements of this specifications it shall be optional with the purchaser to accept or reject the equipment/machinery and direct the tenderer to at once proceed to furnish such new parts as may be necessary to make it meet the guarantees and requirements. All expenses of furnishing and of installations new parts or alternations to existing parts and all test made necessary by failure if the apparatus to the guarantees and other requirements of the specification shall be borne by the tenderer.

XII. Co-coordinating:- In the event of a tenderer offering items manufactured by different manufactures, it will be his responsibility to fully co-ordinate the activities of each manufacturer in such a way that the complete equipment contracted is supplied in accordance with the contract. No extra charges shall be payable for these services.

XIII. Financial Resources and Experience:- The tenderer shall submit a statement of facts in detail as to his previous experience in performing similar or comparable work and of the business and technical organization, financial resources furnish the list of important consumers for which material were supplied and/or erected in India and also testing facilities available at contractor's work.

XIV. Deviations:- Any deviations from the specifications, if found necessary by the tenderer, shall be clearly set such deviations. The advantages claimed, if any due to such deviation shall be clearly indicated.

XV. Insurance:- This is a works contract. The tenderer shall take open insurance policy for the erection, to cover the risks by/of damages to property or person in the execution of the contract including third party liability. This insurance shall include switchgear and its associated equipments also.

The contractor shall indemnify the department against loss to materials issued to him by the department for this work by taking an indemnity shall not be responsible for any damage or compensation payable by law in consequence of any accident to workmen or others in the employment of the contractor.

XVI Guarantee:- The contractor shall warrant that the work is carried out in accordance with the specification. The equipment, structures etc. supplied shall be free from defects in materials and workmanship. The contractor shall furnish performance guarantee for a period of **eighteen months** from the date of commissioning.

XVII. Completion period:- The time allowed for completion for all the works covered under this contract shall be 60 days from the fifteenth day after the date of written orders to commence this work. The period includes monsoon.

XVIII Payments:- 90% payment will be made after supply of equipment and the remaining 10% will be paid after erection, testing and commissioning of the equipments. Income Tax/ work tax if any shall be deducted in the bills as per the rules in force.

XIX. BAR OF JURISDICTION: Puducherry civil court.

XX. All the intending tenderers are requested to note that in the event of the documents furnished with the offer being found to be bogus or the documents contain certain false particulars, the EMD paid by such tenderers will be forfeited in addition to black listing them for future tenders/contracts in Electricity Department.

XXI. The successful tenderer shall comply with all the provision of Minimum Wages Act 1948. Contract Labour (Regulation and Abolition) Act and Rules framed there under and other labour laws affecting contract labour that may be brought into force from time to time.

SECTION-V
TECHNICAL SPECIFICATION FOR 11 KV RING MAIN UNIT SWITCHGEAR.
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TECHNICAL SPECIFICATION FOR MAINTENANCE FREE OUT DOOR 11 KV RING MAIN UNIT SWITCHGEAR

1.0. SCOPE

Design, Engineering, Manufacture, assembly, Stage testing, inspection and testing before supply and delivery at site, Erection, Installation, testing & Commissioning of Ring Main units outdoor type SF6 (with 2 numbers Load break Isolators for 11 KV Incoming & Out going cables and SF6/Vacuum Breaker for Distribution Transformer) with combinations of load break isolators & breakers as below 1 no 1RMU with 1 Load Break Switch & 2 Circuit Breakers.

The unit should be suitable for outdoor and resistive to saline effect. The RMUs should be provided with necessary take off terminal units for future connecting additional units and all these units are shielded in an outdoor metal body with a dielectric media of SF6 gas with provision of additional load break switches and circuit breakers extensible in future wherever required. Dismantling the existing 11KV Outdoor Oil RMU, Erecting the new SF6 RMU on necessary concrete foundations and transporting all the dismantled items in as and where it is condition to the PED stores. The work also include supply, erection, installation, testing & commissioning of Terminations for the Incoming, Outgoing lines & Transformer Cables (RMU side & DT HV side).

All the above said works are to be executed under **TURNKEY** basis including civil and earthing works.

1.1 This Specification provides for design, manufacture, inspection and testing before despatch, packing and delivery F.O.R.(Destination) of SF6 insulated RMUs with necessary take off terminal units for future automations, other accessories and auxiliaries equipments and mandatory spares, described herein and required for their satisfactory operation for PED.

1.2. The objective of the RMUs is for extremely small construction width, Compact, maintenance free, independent of climate, easy installation, operational reliability, Safe and easy to operate, minimum construction cost, minimum site work and minimum space requirement.

1.3. The RMUs shall conform in all respects to high standards Of Engineering design, workmanship and latest revisions of relevant standards at the time of offer and purchaser shall have the right to reject any work or material which in his judgment is not in full accordance therewith.

1.4. The type of the 11 KV circuit breaker shall be either SF6/Vacuum and insulating medium for load break isolators, Earth switch, 11 KV Buses and other associated equipments should be SF6 gas.

2.0 GENERAL

The Ring Main Unit shall be installed at 11 KV junction point to have continuous supply by isolating faulty sections. The RMU shall be extensible and consists of the combinations with 1 load break switch and 2 Circuit breakers (as mentioned by PED) for a nominal voltage of 12 KV using SF6 gas/Vacuum as insulating and SF6 as arc quenching medium.

The RMU and combination shall be erected at outdoor, tropicalised and outdoor metal enclosed type. The RMU metal parts shall be of high thickness high tensile steel which must be grit/short blasted, thermally sprayed with Zinc alloy, phosphate and subsequently painted with polyurethane based powder paint, the overall paint layer thickness shall be not less than 150 microns.

Relevant IE rules for clearances, safety and operation inside the enclosure shall be applicable. The enclosure shall be IP 54 and type tested for weather proof at EREDA/CPRI.

All live parts except for the cable connections and busbar interconnections shall be insulated with SF6 gas. The SF6 enclosure shall be made of robotically welded stainless steel/Metallised Cast Resin.

The cubicle shall be metal enclosed with a sheet steel of high thickness and provided with a pressure relief arrangement away from operator.

Both the load break switches and the tee off circuit breaker shall be suitable for modernization in future.

Any accidental over pressure inside the sealed chamber shall be limited by the opening of a pressure-limiting device in the rear/top part of the enclosure. Gas will be release to the rear of the switchboard away from the operator to ensure safety of the operating personnel and all the manual operations will be carried out on the front of the switchboard.

The Entire units of RMU shall be in a single compact metal clad, outdoor type suitable for all weather conditions. The switchgear and bus bar except bus bar interconnections shall all be filled with SF6 at 0.5 bar IEC/IS Standards relative pressure to ensure the insulation and breaking functions. The enclosure must be sealed for life and shall meet the "sealed pressure system" criterion in accordance with the IEC 298 standard. The RMU must be a system for which no handling of gas is required throughout the 25 years of service life.

The enclosure for switchgear and metallic RMU housing shall have a design such that in the event of an internal arc fault, the operator shall be safe. This should be in accordance with IEC 298 and relevant Test certificates shall be submitted.Suitable temperature rise test on the RMU with enclosure shall be carried out & test reports shall be submitted.

Each switchboard shall be identified by an appropriately sized label, which clearly indicates the functional units and their electrical characteristics.

The switchgear and switchboard shall be designed so that the position of the different devices is visible to the operator on the front of the switchboard and operations are visible as well.

The entire system shall be totally encapsulated. There shall be no access to exposed conductors. In accordance with the standards in effect, the switchboards shall be designed so as to prevent access to all live parts during operation without the use of tools.

The contractor/Bidder should connect the associated power cables (cables shall be provided by PED) with the RMU and distribution transformer. The entire 11 KV RMU are insulated by inert gas (SF6) suitable for operating voltage up to 12 KV respectively. The 11 KV circuit breakers must be SF6 breaker/vacuum. It is necessary to fit an absorption material in the tank to absorb the moisture from the SF6 gas to regenerate the SF6 gas following arc interruption. The SF6 insulating medium shall be constantly monitored via a temperature compensating gas pressure indicator offering a simple indication. All the combination of the RMUs should have the required SF6 insulation by providing necessary gas chamber capacity.

The Contractor shall carry out the erection of the RMUs etc at Change of location if PED insists on.

Sulphur Hexa fluoride Gas(SF6 GAS)

The SF6 gas shall comply with IEC 376,376A,and 376B and shall be suitable in all respects for use in 11 KV panels under the operating conditions. The SF6 shall be tested for purity, dew point air hydrolysable fluorides and water content as per IEC 376,376A and 376B and test certificate shall be furnished to the owner indicating all the tests as per IEC 376 for each Lot of SF6 Gas.

3.0 STANDARDS

Unless otherwise specified elsewhere in this Specification, the RMU, Switchboard (Switchgear), Load break isolators, Instrument Transformers and other associated accessories shall conform to the latest revisions and amendments thereof of the following standards.

- 1) IEC 60 298/IEC 62 271-200/IS 12729:1988 - General requirement for
Metal Enclosed Switchgear
- 2) IEC60129/IEC62271-102/IS 9921 - Alternating current disconnectors
(Load break isolators) and earthing switch
- 3) IEC 62 271-100/IEC 60 056/IS 13118:1991 - Specification for alternating
IEC 62 271-200 current circuit breakers.
- 4) IEC 62 271-1/IEC 60694 - Panel design, SF6/Vacuum Circuit Breakers
- 5) IEC 60044-1/IEC 60185/IS 2705:1992 - Current Transformer
- 7) IEC 60265/IS 9920:1981- High voltage switches.
- 8) IEC 376 - Filling of SF6 gas in RMU.
- 9) IEC 60273/IS :2099 - Dimension of Indoor & Outdoor post insulators
with voltage > 1000 Volts.
- 10)IEC 60529/IS 13947(Part-1) - Degree of protection provided by
enclosures for low voltage switchgear and
control gear.

11) Indian Electricity Rules.

Equipment meeting with the requirements of any other authoritative standards, which ensures equal or better quality than the standard mentioned above shall also be acceptable. If the equipments, offered by the Bidder conform to other standards, salient points of difference between the standards adopted and the specific standards shall be clearly brought out in relevant schedule. In case of any difference between provisions of these standards and provisions of this specification, the provisions contained in this specification shall prevail. One copy of such standards with authentic English Translations shall be furnished along with the offer.(Hard copy)

4.0. THE STANDARDS MENTIONED ABOVE ARE AVAILABLE FROM:

REFERENCE/ ABBREVIATION	NAME AND ADDRESS FROM WHICH THE STANDARDS ARE AVAILABLE
IEC	INTERNATIONAL ELECTRO-TECHNICAL COMMISSION, BUREAU CENTRAL DE LA COMMISSION, ELECTRO TECHNIQUE INTERNATIONALE, 1, RUE DE VEREMBE, GENEVA, SWITZERLAND.
ISO	INTERNATIONAL STANDARD ORGANISATION

5.0. CLIMATE CONDITIONS

The climatic conditions under which the equipment should operate satisfactory are as under:

Maximum ambient air temperature	: 50° C
Minimum ambient air temperature	: 10° C
Maximum daily average ambient air temperature	: 40° C
Maximum humidity	: 100%
Max. wind pressure(Kg/sq.m)	: 200
Average thunder storm days per annum	: 50

6.0. RMU OUTDOOR METAL CLAD

The RMU enclosure must be a metallic, it follows an industrialized process of manufacturing. The RMU shall be of single bus bar SF6 gas insulated outdoor, tropicalised and metal enclosed type. The RMU metal parts shall be made of high thickness high tensile steel which must be grit/short blasted, thermally sprayed with Zinc alloy, phosphate and subsequently painted with polyurethane based powder paint, the overall paint layer thickness shall be not less than 150 microns. The rating of enclosure shall be suitable for operation on three phases, three wire, 11 KV, 50 cycles, A.C. System with short-time current rating of not less than 20KA for 3 seconds.

7.0. TAKE OFF TERMINAL UNITS FOR FUTURE AUTOMATION:

The RMU should be provided with necessary take off terminal units for future automations.

8.0. ISOLATORS (LOAD BREAK TYPE)

The load break isolators for Incoming and Outgoing supply must be provided and the load break isolators are fully insulated by SF6 gas. The load break isolators shall have continuous of not less than 630 Amp. Rating and consist of fault making/load breaking spring assisted ring switches, each with integral fault making earth switches. The switch shall be naturally interlocked to prevent the main and earth switch being switched 'ON' at the same time. The selection of the main and earth switch is made by a lever on the facia, which is allowed to move only if the main or earth switch is in the off position. The load break isolators should have the facility for future remote operation. Each load break switch shall be of the triple pole, simultaneously operated, non-automatic type with quick break contacts and with integral earthing arrangement.

8.1. EARTHING OF ISOLATORS AND DISTRIBUTION TRANSFORMER BREAKERS (EARTH SWITCH)

Necessary arrangements are provided at Load break isolators/Distribution Transformer Breaker for selecting Earth position. Mechanical interlocking systems shall prevent the RMU function from being operated from the 'ON' to 'Earth On' position without going through the 'OFF' position.

9.0. DISTRIBUTION TRANSFORMER BREAKER (SF6 / VACUUM)

The Distribution Transformers (DT) shall be provided by PED along with the associated power cables, which have various capacities of 315/500/630/1000 KVA. **(The contractor shall erect both the RMUs and termination kits at RMU side.)**

The SF6/Vacuum breaker for the controlling of DT must be provided inside the outdoor metal clad and insulated by SF6 gas.

The SF6/Vacuum circuit breaker must be a spring assisted three positions with integral fault making earth switch. The selection of the main/earth switch lever on the facia, which is allowed to move only if the main or earth switches is in the off position.

The manual operation of the circuit breaker shall not have an effect on the trip spring. This should only be discharged under a fault (electrical) trip; the following manual reset operation should recharge the trip spring and reset the circuit breaker mechanism in the main off position.

The circuit breaker shall be fitted with a mechanical flag, which shall operate in the event of a fault (electrical) trip occurring. The 'tripped' flag should be an unambiguous colour differing from any other flag or mimic.

Both the circuit breaker and ring switches shall be operatable by the same unidirectional handle.

The protection on the circuit breaker shall comprise of the following components: The circuit breaker unit fitted with protection CT's, a low burden trip coil and auxiliary switch assembly allowing the use of a **self powered (No external DC or AC source required) IDMT protection relays (Numeric/Micro processor based)** 3 x over current and earth fault element shall be Definite Time type relay. The protection system should be suitable for protecting transformers of rated power from 250 KVA on wards. The relay should be housed within a pilot cable box accessible. A facility of provision for the delay of transformer in-rush current shall be provided on relay to avoid nuisance tripping.

10.0. BUSHINGS

The units are fitted with the standardized bushings that comply with IEC standards. All the bushings are the same height from the ground and are protected by a cable cover.

11.0. CABLE BOXES

All the cable boxes shall be air insulated suitable for dry type cable terminations. The cable boxes at each of the ring switches suitable for accepting HV cables of sizes 3c x 400 sq.mm/3c x 300sqmm/3c x 120sqmm/3c X 95sqmm/3c X 50 sq.mm and circuit breaker cable suitable up to 3c x 300 sq.mm. Necessary Right angle Boot should be supplied to the cable terminations .***The type of the Right angle Boot should be cold applied insulating Boot.***

12.0. CABLE TESTING FACILITY

It shall be possible to test the cable without opening the cable boxes.

13.0. VOLTAGE INDICATOR LAMPS AND PHASE COMPARATORS

The RMU shall be equipped with a voltage indication to indicate whether or not there is voltage on the cable. There should be a facility to check the synchronization of phases with the use of external device. It shall be possible for the each of the function of the RMU to be equipped with a permanent voltage indication as per IEC 601958 to indicate whether or not there is voltage on the cables.

14.0. EXTENSIBLE

Each combination of RMU shall have the provision for extension by load break isolators / breakers in future, with suitable trunking chamber and accessories and necessary Bus Bar. Extensible isolators and circuit breakers shall be individually housed in separate SF6 gas enclosures. Multiple devices inside single gas tank / enclosure will not be acceptable. In case of extensible circuit breakers, the Breaker should be capable of necessary short circuit operations as per IEC at 20 KA, and the Breaker should have a rated current carrying capacity of 630 A.

15.0. WIRING & TERMINALS:

The wiring should be of high standard and should be able to withstand the tropical weather conditions. All the wiring and terminals (including take off terminals wiring for future automation, DC, Control wiring), Spare terminals shall be provided by the contractor. The wiring cable must be standard single-core non-sheathed, Core marking (ferrules), stripped with non-notching tools and fitted with end sleeves, marked in accordance with the circuit diagram with printed adhesive marking strips.

The wiring should be of high standard and should be able to withstand the tropical weather conditions. All wiring shall be provided with single core multistrand copper conductor wires with P.V.C insulation and shall be flame retardant low smoke type.

The wiring shall be carried out using multi-strand copper conductor super flexible PVC insulated wires of 650/1100V Grade for AC Power, DC Control and CT circuits. Suitable colored wires shall be used for phase identification and ferrules shall be provided at both ends of the wires for wire identification. Terminal should be suitably protected to eliminate sulphating. Connections and terminal should be able to withstand vibrations. The terminal blocks should be disconnecting link type terminals for CT leads with suitable spring washer and lock nuts.

Flexible wires shall be used for wiring of devices on moving parts such as swinging Panels (Switch Gear) or panel doors. Panel wiring shall be securely supported, neatly arranged readily accessible and connected to equipment terminals, terminal blocks and wiring gutters. The cables shall be uniformly bunched and tied by means of PVC belts.

The position of PVC wires should not give any hindrance for fixing or removing relay casing, switches etc., Wire termination shall be made with solderless crimping type of tinned copper lugs. Core identification plastic ferrules marked to correspond with panel wiring diagram shall be fitted with both ends of each wire. Ferrules shall fit tightly on the wire when disconnected. The wire number shown on the wiring shall be in accordance with the IS.375.

All wires directly connected to trip circuits of breaker or devices shall be distinguished by addition of a red color unlettered ferrule.

The wiring shall be in accordance to the wiring diagram for proper functioning of the connected equipment. Terminal blocks shall not be less than 650V grade and shall be piece-molded type with insulation barriers.

The terminals are to be marked with the terminal number in accordance with the circuit diagram and terminal diagram. The terminals should not have any function designation and are of the tension spring and plug-in type.

16.0. EARTHING

The RMU outdoor metal clad, Switch Gear, Load break isolators, Distribution Transformer., shall be equipped with an earth bus securely fixed along the base of the RMU.

The contractor must provide separate earthing pits and earth bus for the following and the same shall be interconnected by using M.S. Flats

- 1. RMU Outdoor metal body, (Switch Gear & Load break isolators) Distribution Transformer tank and other metal parts,**
- 2. Distribution Transformer Neutral.**

When several units of the RMU(Extra Isolators / Breakers) are mounted adjoining to each other, the earth bus shall be made continuous and necessary connectors and clamps for this purpose shall be included in the scope of supply. The size of the earth bus shall be as per IEC/IS standards with **copper flat for RMU, and M.S.Flat for Distribution Transformer and neutral earthing.** Provision shall be made one end of RMU for connecting the earth bus to the earth grid by erecting suitable 2 Nos. of earth pipes of 50mm dia G.I. Pipe 3 mts. in pits. Both the earth pipes are also to be connected in a grid formation. Necessary terminal clamps and connectors shall be included in the scope of supply.

NOTE: If there are two or more Distribution Transformers, separate Earth Pipes in a pit should be provided for each Transformer Neutral and it shall be connected with the earth grid.

All metal parts of the switchgear which do not belong to main circuit and which can collect electric charges causing dangerous effect shall be connected to the earthing conductor made of **copper** having area of minimum 150 sq.mm". Each end of conductor shall be terminated by equivalent quality and type of terminal for connection to earth system installation. Earth conductor location shall not obstruct access to cable terminations. The following items are to be connected to the main earth conductor by rigid or **copper** conductors having a minimum cross section of 150 Sq.mm" (a) earthing switches (b) Cable sheath or screen (c) capacitors used in voltage control devices, if any.

All metallic cases of the relays, instruments and other panel mounted Equipment's shall be connected to the earth bus by independent copper wires of size shall be made of IEC/IS standards. The colour code of earthing wire shall be green. Earthing wires shall be connected on the terminals with suitable clamp connectors and soldering shall not be permitted.

17.0 CIVIL WORKS

The work shall include the following

- 1)Mass plinth foundation for mounting RMU and associate combination of Isolators and Breakers
- 2)Mass plinth foundation for LT Feeder Pillar boxes.
- 3)Foundation at water logging area shall be elevated, additional cost will not be provided.

18.0. ACCESSORIES & SPARES:

The following spares and accessories shall be supplied along with the main equipments at free of costs.

- 1) Charging lever for operating load break isolators & circuit breaker of each RMU
- 2) Kit for identifying SF6 gas leakage – 1 number
- 3) Necessary SF6 gas filling tank with adopter and tools etc for filling SF6 gas at Site - 2 Nos.
- 4) Necessary gas cylinders with SF6 Gas and adopter, pressure gauge for storage of SF6 gas –2 Nos. (Preferably 20 Kg.)
- 5) Any other spares & Tools, which are all essentially required at the time of emergency and routine maintenance.

Provision shall be made for padlocking the load break switches/ Circuit breaker, and the earthing switches in either open or closed position with lock & master key.

19.0. TESTING OF EQUIPMENT & ACCESSORIES:

Provision for testing CTs, Relays, Breakers and Cables shall be made available. Procedure and schedule for Periodical & Annual testings of equipments, relays, etc. shall be provided by the supplier.

20.0. TESTS:

20.1. TYPE TEST

The Tenderers should, along with the tender documents, submit copies of all Type test certificate of their make in full shape as confirming to relevant ISS/IEC of latest issue obtained from a Govt. Lab/Recognized laboratory/CPRI-Bangalore.

The above type test certificates should accompany the drawings for the materials duly signed by the institution who has type test certificate. The details of type test certificate as per Schedule.

20.2. ACCEPTANCE AND ROUTINE TESTS

All acceptance and routine tests as stipulated in the latest IEC- shall be carried out by the supplier in the presence of PED representative. The supplier shall give at least 15 days advance intimation to the PED to enable them to depute their representative for witnessing the tests.

20.3. ADDITIONAL TESTS

The Department reserves the right for carrying out any other tests of a reasonable nature at the works of the supplier/laboratory or at any other recognized laboratory/research institute.

20.4. PRE-COMMISSIONING TESTS

The supplier has to arrange all the pre-commissioning tests in the presence of the PED testing Engineer and necessary drawing manual and periodical test tools shall be arranged to be supplied. Also outdoor test for RMU should be conducted.

The above tests are the responsibility of the contractor till the RMUs are put in to service.

21.0. INSPECTION:

The inspection will be carried out by the PED at any stage of manufacture. The supplier shall grant free access to PED's representative at a reasonable time when the work is in progress. Inspection and acceptance of any equipment under this specification by the PED shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective.

The supplier shall keep PED informed in advance, about the manufacturing programme so that arrangement can be made for inspection. The Department reserves the right to insist for witnessing the acceptance/routine testing of the bought out items. PED has rights to inspect the supplier's premises for each and every consignment for type & routine test.

No material shall be dispatched from its point of manufacture unless the material has been satisfactorily inspected and tested / unless the same is waived by the PED in writing.

22.0. QUALITY ASSURANCE PLAN:

The bidder shall invariably furnish following information along with his the offer.

- (i) Statement giving list of important raw materials including but not limited to
 - (a) Contact material
 - (a) Insulation
 - (c) Sealing material
 - (d) Contactor, limit switches, etc. in control cabinet.

Name of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested, list of test normally carried out on raw materials in presence of Bidder's representative, copies of test certificates.

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

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

iv) Special features provided in the equipment to make it maintenance free.

v) List of testing equipment available with the Bidder for final testing of RMUs and associated combinations vis-à-vis, the type, special, acceptance and routine tests specified in the relevant standards. These limitations shall be very clearly brought out in the relevant schedule i.e. schedule of deviations from specified test requirements. The supplier shall, within 15 days from the date of receipt of Purchase Order submit following information to PED.

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

ii) Necessary test certificates of the raw material and bought out accessories.

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

The supplier shall submit the routine test certificates of bought out items and raw material, at the time of routine testing of the fully assembled breaker. The Department reserves the right to select the make of the bought out items.

23.0 TRAINING:

The supplier shall give rigorous training to at least 2 PED Engineers & staff at the site/factory for 3 days in attending trouble shooting and maintenance works.

24.0. SCADA CONNECTIVITY:

Provision shall be made in all the RMUs with necessary take off terminal units for future automations. Further space for modernization wherever required for future SCADA operation should be provided.

25.0 DOCUMENTATION

All drawings shall conform to relevant International Standards Organization (ISO) Specification. All drawings shall be in ink and suitable for microfilming.

26.0. DRAWINGS

The tenderer shall submit along with his tender dimensional general arrangement drawings of the equipments, illustrative and descriptive literature in triplicate for various items in the RMUs which are all essentially required for future automation.

- i) Schematic diagram of the RMU panel
- ii) Instruction manuals
- iii) Catalogues of spares recommended with drawing to indicate each items of spares
- iv) List of spares and special tools recommended by the supplier.
- v) Copies of Type Test Certificates as per latest IS/IEC.
- vi) Drawings of equipments, relays, control wiring circuit, etc.
- vii) Foundation drawings of RMU and D.T.Structure.
- viii) Dimensional drawings of each material used for item Vii.
- ix) Actual single line diagram of RMU/RMUs with or without Extra combinations shall be made displayed on the front portion of the RMU so as to carry out the operations easily.

The following should be supplied to each consignee cycle along with the initial supply of the equipments ordered.

5 copies of printed and bound volumes of operation, maintenance and erection manuals in English along with the copies of approved drawings and type test reports etc.

3 sets of the manuals as above shall be supplied to The Executive Engineer-I, Puducherry Electricity Department. A soft copy of the all Technical and Drawing shall be furnished in a CD

27.0. NAME PLATE:

Each RMU and its associated equipments shall be provided with a nameplate legible and indelibly marked with at least the following information.

- (a) Name of manufacturer
- (b) Type, design and serial number
- (c) Rated voltage and current
- (d) Rated frequency
- (e) Rated symmetrical breaking capacity
- (f) Rated making capacity
- (g) Rated short time current and its duration
- (h) Purchase Order number and date
- (i) Month and Year of supply
- (j) Rated lightning impulse withstand voltage
- (k) D.C. component of current.
- (l) Feeder name(Incoming and Out going),DTs Structure name,11,000 Volts Dangers etc.

NOTE: Whether the circuit breaker is fitted with closing/tripping devices necessitating an auxiliary supply shall be stated either on the circuit breaker name plate or any other acceptable position.

28.0. ERECTION AND COMMISSIONING:

All the erection works like Transportation, erection of RMUs with necessary take off terminal units for future automations, foundation structures for RMUs, LT Feeder Pillar Boxes which includes civil & concrete works, foundation structures, earthing, Control cable wiring etc. shall be erected, tested & commissioned under turnkey basis. The Distribution Transformers /New Distribution Transformers and the associated power cables alone will be provided by Puducherry Electricity Department.

29.0. FAULT PASSAGE INDICATORS (FPI):

These shall facilitate quick detection of faulty section of line. The fault indication may be on the basis of monitoring fault current flow through the device. The unit should be self-contained requiring no auxiliary power supply. The FPI shall be integral part of RMU, shall be capable of displaying the fault and phase currents. The FPI shall have **LCD/LED display**, automatic reset facility.

30.0. TROPICALISATION

Due regard should be given to the climatic conditions under which the equipment is to work. Ambient temperature normally varies between 20 ° C and 50 ° C, although direct sun temperature may reach 50 °C. The climate is very humid and rapid variations occur, relative humidity between 90% and 100% being frequently recorded, but these values generally correspond to the lower ambient temperatures. The equipment should also be designed to prevent ingress of vermin, accidental

contact with live parts and to minimize the ingress of dust and dirt. The equipment should also be designed to withstand saline effect, since this Union territory is a coastal area. The use of materials which may be liable to attack by termites and other insects should be avoided.

31.0 DISMANTLING AND DEVOLUTION

All the dismantled materials like Oil RMU shall be transported to PED store as is where is conditions.
All cares shall be taken during the dismantling of materials, DTs, etc.

32.0. TECHNICAL SPECIFICATION FOR RMU

I. 11KV Bus Bar

Type of material : Copper
 Current Carrying Capacity : **630 Amps.**
Short time rating current for 3 secs. : 20 KA (not less than)
 Insulation of bus bar : SF6

II. Parameters for Switch Gear of DT and load break isolators

Type : Metal enclosed
 No of Phases : 3
 No. of poles : 3
 Rated voltage :12 KV
 Operating voltage :11 KV(+10% to -20%)
 Rated lightning impulse withstand voltage :**75 KV (Peak)**
 Rated power frequency withstand voltage :28 KV
 Insulating gas :SF6
 Rated filling level for insulation :0.5 bar/As Per IEC.
 Rated short time current :20 KA.
 Rated short time :3s
 Rated peak withstand current :50 KA.(Not less than)
 Operating mechanism: Circuit breaker with spring assisted anti reflex mechanism.
 Rated current (Bus): **:630 A**
 Rated current (breaker) **:630 A**
 Circuit Breaker interrupter **:SF6/Vacuum**
 Rated frequency **: 50 Hz**
 Rated operating sequence **:O-3min- CO**
Number of mechanical/Remote operations for earthing & Ring switches & Number of mechanical/ remote operations for circuit breakers } **As per IEC 60298**

III.PRINCIPAL FEATURES

Sl. No.	DESCRIPTION	DT breaker
1	Circuit label	Yes
2	Mimic diagram	Yes
3	Supply voltage indication	Yes
4	Current Transformer	Yes
5	Self Powered based Microprocessor based Relay (3OL)/EL	Yes
6	Anti –Reflexing Relay	Yes
7	Interlock to defend the operation of the line side earthing when the line side isolator is ON.	Yes
8	Interlock to defend the operation of the earthing when the breaker is in service position and is ON.	Yes
9	Local /Remote Switch	Yes
10	Breaker ON/OFF indication	Yes
11	Spring Charge indication / Spring assisted mechanism.	Yes
12	Fault Tripping indication	Yes
13	Bus bar end caps	Yes
14	Whether the SF6 gas pressure gauge indicator and filling arrangement.	Yes
15	Whether the spring assisted mechanism with operating handle for ON/OFF.	Yes
16	Whether the earth positions with arrangement for padlocking in each position and independent manual operation with mechanically operated indicator are provided	Yes
17	RMUs are provided with necessary take off terminals for future automation.	Yes

IV.3 Load break switch(Isolators)

Type : SF6 load breaking and fault making.
 Rated current : 630 A
 Fault making capacity(KA peak min.) : 50 KA

IV. Earthing switch for 11 KV Line side Isolation and DT

Rated short time current :20 KA.
 Rated short time :3s
 Rated peak withstand current :50 KA
 Interlocking facility: 1) Between 11 KV Line side isolator 'ON'& Earthing.
 2) Between 11 KV DT side breaker on close condition & Earthing.

VI. Current Transformers for breaker

CT Type	: Tape wound
CT Description	:The CTs of DT breaker shall be suitable for sensing the minimum primary variable current in the order of 10-100 A and the secondary current for the CT is 1 A. The CT shall be housed in outside SF6 chamber for testing and Maintenance
Accuracy Class	: class X/5P10 protection
Rated burden	: Suitable for self powered relay.

33.0 TERMINATIONS

The Terminations should be provided by the contractor at the following places in RMU.

- 1) Incoming cable to Isolators
- 2) Outgoing cable from Isolators
- 3) Outgoing cable from Dt Breaker of RMU to the DT HTside

The terminations should be suitable for Indoor of the RMU & outdoor of the DT. The terminations shall be **Heat shrinkable**. Necessary suitable clamps shall be provided. The quantity and size of termination are indicative however the requirement based on the site condition shall be met.

34.0 GUARANTEE:

- 34.1 The supplier shall guarantee that the goods under the contract are new, unused of the most recent or current models and incorporated all recent improvements in design and materials unless provided other wise in the contract. The supplier shall further guarantee that the goods supplied under this contract shall have no defects arising from design, materials of workmanship, installation and erection, if that may develop under normal use of the supplied goods. The supplier shall also guarantee the performance of the works executed by him including the performance of all the materials/goods supplied by him.
- 34.2 This guarantee for goods and works shall remain valid for 18 **months** for the all equipments of Ring Main Unit and for the civil works from the date of commissioning and taking over by the DEPARTMENT.
- 34.3 The purchaser shall promptly notify supplier/Contractor in writing of any claims arising under this guarantee in respect of goods. Upon receipt of such notice, the supplier/contractor shall, with all reasonable speed, repair or replace the defective parts or parts thereof, free of cost at site. All the expenses towards transportation of defective parts to contractor's works and of repaired/replaced parts to site shall be borne by the contractor.

34.4 If the supplier, having been notified, fails to rectify the defects within 3 days, the purchaser will proceed to take such remedial action as may be necessary, at the supplier's risk and expenses and without prejudice to any other rights which the purchaser may have against the supplier under contract. All expenses in this regard will be recovered from the supplier.

34.5 The EMD and SD will be refund only after the Guarantee period.

ANNEXURE – 1
SCHEDULE OF GUARANTEED PARTICULARS FOR OUTDOOR METAL CLAD

01.	Manufacturer's Name and Country of origin	
02.	Manufacturer's Design / Type ref/Model.	
03.	Material used for making the body of the enclosure	
04.	Standards of manufacturing	
05.	Whether painting for RMU metal enclosure is done as per high standards.	
06.	Whether the enclosure is fire resistive, anti-corrosive with resist saline effect.	
07.	Whether the RMU metal clad is provided with sufficient space for integration of b) Minimum 2 numbers load break isolators and 1 number SF6/Vacuum Circuit breaker. e) Sufficient space for inspection, testing, etc f) Earthing arrangements g) Terminal output points for future automation h) Sufficient arrangement for future extension with Load break isolators/Breakers i) Space for modornization of Load break isolators/Breakers in future.	
08.	Maximum temperature with stand of enclosure.	
09.	Spacing between live part to Earth	
10.	Whether the enclosure are designed to withstand the in all weather conditions (Seashore area, Chemical industries polluted area)	
11.	Period of guarantee of the RMU enclosure.	
12.	Over all dimensions of the RMU enclosure (L x B x H)	
13.	Gauge of the Material used for the fabrication of the RMU enclosure	
14.	Whether the RMU enclosure is manufactured as per IEC/IS standards to hold SF6 gas without leakage.	
15.	Whether the RMU enclosure made provision for sensors for temperature compensated pressure measurement in the relevant gas compartment to monitor the pressure of SF6 gas.	
16.	Whether the RMU enclosure is sealed pressure system.	
17.	Weight of RMU complete with operating mechanism.	
18.	RMUs are provided with necessary take off terminals	
19	Whether the gas chamber is made of stainless steel/Metallised Cast Resin	

ANNEXURE – 2
SCHEDULE OF GUARANTEED PARTICULARS FOR DT BREAKER

01.	Manufacturer's Name and Country of origin	
02.	Manufacturer's Design / Type ref/Model.	
03.	Material used for making the body of the breaker	
04.	Standards of manufacturing	
05.	Whether the breakers are manufactured as per IEC/IS standards	
06.	Maximum temperature with stand of the breakers	
07.	1)Spacing between live part to Earth inside the breaker 2)Spacing between poles	
08.	Period of guarantee of the breaker	
09.	Rated frequency	
10.	Rated voltage	
11.	Highest system voltage	
12.	Rated current	
13.	Short time current rating with duration	
14.	Certificate or report of short circuit type test	
15.	Rated operating duty cycle	
16.	Short circuit breaking current (a)Symmetrical (b)Symmetrical at rated voltage (c)Asymmetrical at rated voltage (i)Per Phase (ii)Average (d)DC Component	
17.	Arcing time (At rated breaking current) in ms.	
18.	Opening time	
19.	Total break time in milli sec. (a)At 90% rated interrupting capacity (b)At rated interrupting capacity	
20.	Breaking Current (a)Rated out of phase current (b)Rated cable charging current (c)Rated kilometric fault level (d)Rated capacitor breaking current	
21.	Make time in ms.	
22.	Maximum temperature rise over ambient (a)Main contacts Terminals	
23.	Rated restriking voltage at 100% and 50% rated capacity. (a)Amplitude factor (b)Phase factor	

	©Natural frequency (d)R.R.R.V.(Volts/micro sec.)	
24.	Dry 1 minute power frequency withstand test voltage (a)Between line terminal and earth KV RMS (b)Between terminals with breaker contacts open KV RMS.	
25.	1.2/50 full wave impulse withstand test voltage (a)Between line terminal and earth KVp. (b)Between terminals with breaker contacts open KVp.	
26.	SF6 / interrupter make	
27.	Contact separation distance	
28.	Type of main contacts	
29.	Contact pressure	
30.	Contact resistance	
31.	Life of the interrupter (in number of operations)	
32.	(i)Tripping at rated current (ii)Tripping at maximum fault current. (Allowable maximum erosion 3 mm) (iii)Mechanical operations.	
33.	Details of main contacts making contact with the breaker truck with the panel	
34.	Control circuit voltage AC/DC.	
35.	Whether trip free or not	
36.	Whether all the interlocks provided	

ANNEXURE – 3

SCHEDULE OF GUARANTEED PARTICULARS FOR LOAD BREAK ISOLATORS & EARTHING ARRANGEMENTS

SL.NO.	DESCRIPTION	ISOLATORS	EARTHING SWITCH FOR DT & ISOLATOR
01.	Manufacturer's Name and Country of origin		
02.	Manufacturer's Design / Type ref/Model.		
03.	Material used for making the body of the isolators .		
04.	Standards of manufacturing		
05.	Whether the isolators & earth positions are manufactured as per IEC/IS standards		
06.	Maximum temperature with stand of the isolators & earth switches		
07.	1)Spacing between live part to Earth 2)Spacing between fixed and moving contacts in the open position.		
08.	Period of guarantee of the isolators		
09.	Rated frequency		
10.	Rated voltage		
11.	Highest system voltage		
12.	Rated current		
13.	Short time current rating with duration		
14.	Certificate or report of short circuit type test		
15.	Rated operating duty cycle		
16.	Short circuit breaking current		
17.	Arcing time (At rated breaking current) in ms.		
18.	Opening time		
19.	Whether all the interlocks provided		
20.	Whether Sufficient arrangements are made to operate the isolators through SCADA in future, also to be ensured for provision of space for accommodation of motor in future		
21.	Fault passage indicator 1)Type/Model 2)Self powered Yes/No 3)Current readings 4)Fault currents 5)Phase currents		

ANNEXURE – 4
SCHEDULE OF GUARANTEED PARTICULARS FOR CURRENT TRANSFORMERS

01.	Manufacturer's Name and country of origin	
02.	Manufacturer's design ref / model	
03.	Applicable Standards	
04.	1)Type of CT 2)Ratio	
05.	Rated Primary current	
06.	Rated secondary current	
07.	Rated frequency	
08.	Transformation ratio	
09.	Number of cores	
10.	Rated output (a) For Core-I	
11.	Class of insulation	
12.	Class of accuracy For Protection	
13.	Short time current rating and its duration	
14.	Secondary resistance at 90 °C	
15.	Continuous over load (percentage)	
16.	One minute power frequency dry withstand voltage	
17.	1.2/50 micro sec. impulse withstand test voltage	
18.	One minute power frequency withstand test voltage on secondary	
19.	Instrument safety factor	
20.	Type of primary winding	
21.	Literature/leaflets pamphlets about the current transformer offered	
22.	Period of guarantee	

ANNEXURE – 5
SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS FOR SELF POWERED
MICRO PROCESSOR BASED NUMERICAL RELAYS

01.	Manufacturer's Name and Country of origin		
02.	Manufacturer's design / Ref. Type		
03.	Applicable Standards		
04.	CurrentSetting range for (a)Overcurrent relay	IDMT	
	(b)Earthfault Element	Definite Time	
05.	Whether the relay has the in-built facilities of IDMT, OL, EL		
06.	Details of IDMT Characteristics		
07.	Accuracy for different settings and limits of errors		
08.	Whether Alpha numeric / LED display		
09.	Whether compatible for 1 A CT Secondary		
10.	Whether draw out type		
11.	Types of case		
12.	Reset time		
13.	Burden of relay		
14.	Maximum and Minimum, operating ambient air temp.		
15.	Whether technical literature pamphlets about the relay offered.		
16.	Period of guarantee.		
17.	Certificate of Proof for Electro Magnetic Interference.		

ANNEXURE – 6
SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS FOR DRAWINGS.

The contractor shall supply the following drawings.

01.	RMU	
02.	General arrangement drawing of panels in station	
03.	Engineering drawing for each panel including foundation details	
04.	Wiring schedule	
05.	Terminal block arrangement drawing	
06.	Descriptive operation and maintenance manual for individual items such as relays, meters, switches recorders etc.	
07.	Any other drawing required for complete understanding of the equipments supplied.	
08.	i)Foundation drawings of RMU and R.S.Joists ii)Dimensional drawings of each materials used.	

Three copies of the drawings shall be submitted to this office for approval.

Six copies of the approved drawings and pamphlets shall be supplied to this office. One copy of the approved drawing and pamphlets for the panels pertaining to each substation shall be supplied to the field Engineers. These drawings and pamphlets shall be supplied in a neat bound book suitable for easy reading and frequent use. In addition reproduceable tracing of the various drawings shall be supplied to this office.

CHECK LIST FOR BID QUALIFICATION

Sl. No.	Particulars	Bidders's response
1.	Name and Address of the Firm/Company	
2.	Address of the Registered office, Phone Nos. etc	
3.	Address of the Factory/Works, Phone Nos. etc.	
4.	Fax No. for correspondence	
5.	(a) Confirm whether the tenderer is a manufacturer of the tendered material (b) If yes, whether documentary evidence is enclosed (c) If so, list the documentary evidence	Yes/No
6.	Whether the bidder is old supplier to the PED	Yes/No
7.	Whether the copies of orders executed during the last five years in respect of materials tendered to State Electricity/Boards/DEPARTMENTS/Power utilities enclosed.	Yes/No
8.	Whether the copies for having erected 100 nos. RMUs.	Yes/No
9.	Whether performance certificates from the end users enclosed	Yes/No
10.	Annual Turn over of the Bidder for the last three years 2006-2007 2007-2008 2008-2009	
11.	a) Whether documentary evidence produced for the annual turn over. b) If so, whether certificate from auditor furnished or copies of audited annual statement of accounts furnished	Yes/No

DATE :
PLACE:

SIGNATURE OF THE TENDERER
NAME :
STATUS IN THE COMPANY
(AFFIX SEAL OF THE COMPANY)

CHECKLIST FOR TECHNICAL TERMS.

Sl. No.	Particulars	Bidder's Response
1.	i) Whether the equipment offered is exactly as per technical specification of the office/Department. ii) If not, give details of technical deviation in the deviation schedule .	Yes/No
2.	i) Whether the tendered equipment is type tested as per the specification of the office/Department.	Yes/No

DATE :

SIGNATURE OF THE TENDERER

PLACE:

NAME :

STATUS IN THE COMPANY

(AFFIX SEAL OF THE COMPANY)

**SCHEDULE - `A1'- PRICE SCHEDULE
(To be filled in by the Tenderer)
ALL AMOUNT IN RUPEES ONLY**

Sl. No.	Description of Materials	Qty in Nos.	Unit price				Unit Sales Tax In % and amount	F.O.R(D)** Price Including ED,F&I,P&F, SalesTax, unloading at stores / site	
			Ex-works Price	Excise Duty in% and amount	F&I*	P & F		UNIT PRICE	TOTAL VALUE (includes Erection,Testing and commissioning)
1	Supply, erection, testing and commissioning of outdoor type RMU with necessary take off terminal units for future automations contains two numbers load break isolators, one number breaker and associated accessories, equipments, and the scope includes civil works also.	1 Unit							

Sl. No.	Description of Materials	Qty in Nos.	Unit price				Unit Sales Tax In % and amount	F.O.R(D)** Price Including ED,F&I,P&F, SalesTax, unloading at stores / site	
			Ex-works Price	Excise Duty in% and amount	F&I*	P & F		UNIT PRICE	TOTAL VALUE (includes Erection,Testing and commissioning)
2	Supply, erection, testing and commissioning of extensible outdoor type Load break Isolators which shall be individually housed in separate SF6 gas enclosures with trunking chamber, Bus bar, accessories with necessary adequate SF6 insulation, etc., for extension and associated accessories, with necessary take off terminal units for future automations. (The scope includes civil works also)	1 No							

Sl. No.	Description of Materials	Qty in Nos.	Unit price				Unit Sales Tax In % and amount	F.O.R(D)** Price Including ED,F&I,P&F, SalesTax, unloading at stores / site	
			Ex-works Price	Excise Duty in% and amount	F&I*	P & F		UNIT PRICE	TOTAL VALUE (includes Erection,Testing and commissioning)
3	Supply, erection, testing and commissioning of extensible outdoor type Distribution Transformer circuit Breakers which shall be individually housed in separate SF6 gas enclosures with trunking chamber, Bus bar, accessories with necessary adequate SF6 insulation, etc., for extension with necessary take off terminal units for future automations. (The scope includes civil works also.)	2 Nos							
4	Supply, erection, testing and commissioning of suitable heat Shrinkable Terminations. (Both the end terminations) (Along with necessary support clamps for cable termination)								

Sl. No.	Description of Materials	Qty in Nos.	Unit price				Unit Sales Tax In % and amount	F.O.R(D)** Price Including ED,F&I,P&F, SalesTax, unloading at stores / site	
			Ex-works Price	Excise Duty in% and amount	F&I*	P & F		UNIT PRICE	TOTAL VALUE (includes Erection,Testing and commissioning)
	(a) 11 KV 400 Sq.mm XLPE/ PILC (b) 11 KV 95 Sq.mm XLPE/PILC	2Nos 4Nos							
5	Materials for total Earthing . (Earth Spike, MS Pipe, MS Flat etc.)as required for the proposed combinations.	LS							
6	Dismantling of existing unit and its related works.	LS							

COMPANY SEAL :

SIGNATURE :
DESIGNATION :
COMPANY :
DATE :

P & F – Packing and Forwarding.

* Freight and Insurance charges including unloading at stores/site, Inland charges & storage

** For supply at the Destination Stores/Electricity Department, Puducherry.

SCHEDULE – B1

DEVIATION FROM TECHNICAL SPECIFICATION

All technical deviations from the specification shall be filled in by the Tenderer, clause by clause, in the Schedule.

SECTION NO.	CLAUSE NO.	DEVIATION

The Tenderer hereby certifies that the above mentioned are the only deviations from the TECHNICAL Specification and the tender confirms to the specification in all other respects.

COMPANY SEAL:

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE – B2

DEVIATION FROM COMMERCIAL TERMS

All deviations from the commercial terms shall be filled in by the Tenderer, clause by clause, in the Schedule.

SECTION NO.	CLAUSE NO.	DEVIATION

The Tenderer hereby certifies that the above mentioned are the only deviations from the Commercial terms of the Specification.

COMPANY SEAL:

SIGNATURE :
DESIGNATION :
COMPANY :
DATE :

SCHEDULE – B3

**STATEMENT OF SUPPLY ORDERS EXECUTED/UNDER EXECUTION DURING THE
PAST FIVE YEARS AS ON THE DATE OF TENDER.**

Sl.No	Name and address of the organization	Name of material	P.O.No. & Date	Qty.	Value of order in Rs. Lakhs	Scheduled date of completion of order	Actual date of completion of order
1.	2.	3.	4.	5.	6.	7.	8.

COMPANY SEAL:

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE – B4

STATEMENT OF TYPE TEST PARTICULARS AS PER RELEVANT IECs)

(To be filled in by the Tenderer)

Sl. No.	Name of Test	Name of Lab	Date of Test
01.	Short time current withstand test and peak current withstand test.		
02.	Lightning Impulse voltage withstand test		
03.	Short Circuit current making and breaking tests		
04.	Power frequency voltage withstand test (dry)		
05.	Temperature rise test		
06.	Mechanical Endurance Test confirming to IEC /		
07	Capacitive current switching test confirming to IEC		
08	Measurement of the resistance of the main circuit.		
09	Other type & routine tests insists by IEC for RMU		
	Checking of degree of protection		
	Switch, circuit breaker, earthing switch making /breaking Capacity		
	Internal arc withstand test		

Yours faithfully,

COMPANY SEAL :

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

NOTE :

The above type tests should have been conducted in a Govt. Lab / Recognized Laboratory within five (5) years from the date of Tender Opening as per relevant IECs.