RAJASTHAN SOLAR PARK DEVELOPMENT COMPANY LIMITED

(CIN NO. U40102RJ2011SGC036861)
Reg. Office: **E-166, Yudhisthir Marg, C-Scheme, Jaipur-302001**
Tel: 2225859, 2229341 **email**: solar.rrec@gmail.com Website: www.rrecl.com

NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

Tenders are hereby invited in e-tender system for design, supply, installation and commissioning of ABT energy meters & its associated system, acquisition of data and its communication / transmission to designated remote locations. Tenders are to be submitted online in electronic format on website http://eproc.rajasthan.gov.in. The tender document / specification can be downloaded from above mentioned website.

GENERAL DETAILS:

A.	**NIT No.**	**TN-04**
B.	**Cost of Tender Specification**	**Rs. 2500.00 (Non refundable)**
C.	**Processing Fee of RISL**	**Rs. 1,000.00 (One Thousand Only)**
D.	**Bid Security**	**2% of the estimated tender value (i.e. Rs. 1.53 Lakhs (Rupees One lakh Fifty Three Thosand only).**
E.	**Validity**	**120 days after the date of tender opening**
F.	**Price**	**'FIRM'**

IMPORTANT DATES:

S.No.	Events	Date & Time	Location
(i)	Pre-bid conference	05.04.2016 (11:30 hrs)	Office of The Managing Director, RSDCL, E-166, Yudhisthir Marg, C-Scheme, Jaipur
(ii)	Date of downloading of tender specification	From 21.03.16 (11:00 Hours) to 24.04.2016 (18:00 Hours)	http://eproc.rajasthan.gov.in
(iii)	Deposit of Cost of Tender Specification, Processing Fee, Bid Security including BG in original, in physical form	Up to 22.04.2016 (15.00 Hours)	Office of The Managing Director, RSDCL, E-166, Yudhisthir Marg, C-Scheme, Jaipur.
(iv)	Last date & time of submission of electronic bid	24.04.2016 (18:00 Hours)	http://eproc.rajasthan.gov.in
(v)	Opening of Technical Bid	25.04.2016 (11.30 Hours)	http://eproc.rajasthan.gov.in
(vi)	Opening of Price Bid	To be intimated separately to the qualified bidders	http://eproc.rajasthan.gov.in

NOTE:-

1. The bidders are requested to submit their bids prior to last date of submission to avoid Non-submission of their bids up to prescribed date due & time to non-availability of/ hanging of website at last moments or any reason whatsoever. The last date of submission of bids will not be extended if system is hang up in last hours or congestion.

2. Furnishing of Bid security (DD/ Banker's Cheque and in the shape of BG) for an amount as specified in this specification and proof for deposit of Bid Security, e-tender processing fee & cost of tender specification before techno-commercial bid opening are essential otherwise the techno-commercial bid in electronic form (cover-II) will not be opened.

3.(i) The bidder will have to deposit prescribed cost of tender specification by DD/Banker's Cheque payable in favour of RSDCL, Jaipur up to stipulated date & time in the office of the Director (Technical), E-166, Yudhishthir Marg, C-Scheme, RSDCL, Jaipur and shall upload the photo copy of DD/Banker's Cheque along with their online bid.

(ii) The bidder will have to deposit 20% amount of prescribed Bid Security by DD/Banker's Cheque payable in favour of RSDCL, Jaipur along with Bid security Bank Guarantee in original of balance 80% amount as specified in the specification in the office of the Director (Tech), E-166, Yudhishthir Marg, C-Scheme, RSDCL, Jaipur on the Rajasthan State Non Judicial Stamp Paper of Rs.100/- purchased in name of the executant's Bank duly authenticated either by a first class Magistrate or Notary Public or directly confirmed by the issuing Bankers & shall be valid for 120 days with the grace period of 90 days (Bid Bank Guarantee format is enclosed at Annexure-IV, Vol-I or tenderer may also furnish entire amount of Bid Security by DD/Banker's Cheque up to stipulated date & time in the office of the Director (Tech), E-166, Yudhishthir Marg, C-Scheme, RSDCL, Jaipur and obtain a receipt thereof.

(iii) The bidder will have to submit prescribed Processing Fee by crossed DD/Banker's cheque in favour of M.D., RISL payable at Jaipur with the Director (Tech), E-166, Yudhishthir Marg, C-Scheme, RSDCL, Jaipur and obtain a acknowledgement thereof and shall also upload the photo copy of DD/Banker's Cheque along with their online bid .

4. Technical and Commercial deviations, if any, shall only be mentioned in **Schedule-IV** "Departure from the Specification" attached with this specification. Mentioning of such deviations elsewhere in the offer will not be considered as deviation. The printed terms and conditions of firms, if any, attached with the tender will not be considered. RSDCL shall have right to accept or reject these deviations.

5. Offers of bidders without Schedule-I to IV & the Price Schedules i.e. Schedule-A to B and without relevant documents as mentioned at clause No.10 of ITB with respect to qualifying requirements shall not be considered.

6. Any cutting/over writing in the figures of tendered documents should also be clarified / indicated in the words duly signed.

7. The prices quoted for all the items as mentioned in ITB Clause No.16.0 shall be firm only i.e. without any variation.

8. RSDCL reserves the right to wave/ accept minor deviation (s), if they do not materially affect the capability of the bidder to perform the contract.

9. Deviation of any kind shall "not" be quoted in the price bid and if found quoted, the same shall be ignored.

10. The purchaser will respond in writing to any request for clarification on bidding documents which it receives not later than 15 days prior to deadline for submission of bid, after which no correspondence shall be entertained.

11.(i) The contractor shall arrange free of charges, suitable accommodation and transport facility for local journey to RSDCL's representative nominated for inspection, if the PO cost is more than 50.00 lakhs.

(ii) Supplier shall arrange "To and Fro" Air tickets of economy class for journey of inspecting officer(s) from nearest airport of the work place of inspecting officer to their works or the place where inspection is to be carried out and back at suppliers cost after coordinating with the inspecting officer(s). Suitable transport facility for the inspecting officer(s) from his work place to the nearest airport for "to and fro" journey will also be arranged by the supplier.

In case, if place of inspection is not connected through Air, the supplier will arrange "To and Fro" Air tickets of economy class at their cost up to the nearest Airport of the place of inspection and onward journey from nearest airport to place of inspection and back by suitable means i.e. Taxi/ Train (IInd A.C. class) at the cost of supplier.

In case the place of inspection is within 500 KMs. distance from the headquarter of the inspecting officer, the supplier will make suitable travelling arrangement up to the destination of inspection and back by Taxi/ Train (IInd A.C. class) at supplier's cost.

No deductions towards air fare/ travelling expenses will be made by the payment making authority if the inspection is waived by the competent authority.

12. The bidders are required to furnish the clarification/ confirmation/ documents sought subsequent to opening of bid within specified time failing which, the case shall be finalized/decided on the basis of available information. The responsibility of being ignored on account of delay in furnishing of desired information/documents shall be of the bidder.

13. The tender documents can be downloaded from web site **http://eproc.rajasthan.gov.in** up to stipulated date & time. Details of this tender notification can also be seen in NIT exhibited on website **www.rrec.com.** Tenders are to be submitted online in electronic format **only** on website **http://eproc.rajasthan.gov.in**.

14. Bidders who wish to participate in this tender will have to register on **http://eproc.rajasthan.gov.in** . To participate in online tenders, Bidders will have to procure Digital Signature Certificate (Type-II or Type-III) as per Information Technology Act-2000 using which they can sign their electronic bids. Bidders can procure the same from any CCA approved certifying agency i.e. TCS, Safecrypt, Ncode etc. or they may contact e-Procurement Cell, Department of IT & C, Government of Rajasthan for future assistance. Bidders who already have a valid Digital Certificate need not to procure a new Digital Certificate.

Contact No. 0141 – 4022688 (Help desk 10.00 AM to 6.00 PM on all working days)

e-mail: eproc@rajasthan.gov.in
Address : e-Procurement Cell, RISL, Yojana Bhawan, Tilak Marg, C-Scheme, Jaipur.

15. Bidder shall submit their offer online in electronic formats both for technical and financial proposals. However, cost of specification, Bid security (for 20% amount in the form of DD/Bankers Cheque) in the office of Director (Tech) and Bid Security for remaining 80% amount in the form of BG (as per the format enclosed at Annexure-IV, Vol-I of this specification), in the office of Director (Tech) and Processing Fee with Director (Tech) should be submitted physically at E-166, Yudhishthir Marg, C-Scheme, RSDCL, Jaipur.

16. Before electronically submitting the tenders, it should be ensured that all the tender papers including conditions of contract are digitally signed by the tenderer.

17. Bidders are also advised to refer "Bidders Manual" available under "Downloads" section for further details about the e-tendering process.

18. The online tenders will have to be digitally signed and submitted in time specified on **http://eproc.rajasthan.gov.in** in the following manner:-

ONLINE SUBMISSION:

The tenderer have to submit their bid in 3 covers comprises of:-

(a) Cover 1 (.pdf):

It shall contain scanned copy (ies) of (i) Tender specification Cost DD/ Banker's Cheque of Rs. 2500.00 payable in favour of M.D., RSDCL, (ii) DD/ Banker's Cheque of Rs. 1000.00 against processing fee in favour of M.D., RISL payable at Jaipur & (iii) DD/ Banker's Cheque (20%) payable in favour of MD, RSDCL & BG (80%) payable in favour of M.D., RSDCL against Bid Security as per Bid documents.

(b) Cover 2 (.pdf): TECHNO-COMMERCIAL BID (scanned copies) as per clause No.10 (B) of ITB**.**

The techno-commercial information has to be prepared very carefully as indicated in the clause No.10 (B) of ITB provided with this specification since it will be the basis for the pre-qualification of bidders under TN-04. Only relevant and to the point information/ documents should be uploaded. Tenderers should neither upload information not requested in the specification nor make any comments. Failure to provide any required information, may lead to the rejection of the offer. Tenderer must read the specification very carefully before signing on it. After filling requisite information/details desired in the specification & PQR (Pre Qualifying Requirement), the same shall be uploaded with their bid.

(c) Cover 3 (.xls & .pdf):
(a) PRICE BID: BOQs (.xls) (As per clause No.10 (C) of ITB)

This cover consists of price schedules i.e. Schedule-A (BOQ1) for supply of material and Schedule-B (BOQ2) for erection, testing and commissioning of metering system. Further, the bidders are advised to read the instructions as indicated on the top of these price schedules and quote the prices accordingly in the prescribed manner.

These schedules must be digitally signed by authorized representative of the firm.

19. Payment shall be made to supplier/contractor through RTGS/NEFT for quick and safe transfer of funds across the country. The charges for transfer through RTGS/NEFT shall be on the part of supplier/ contractor. The supplier / contractor shall furnish particulars to the payment making authorities of RSCDL in prescribed format to be provided by the purchaser.

20. All the required information shall be furnished strictly in prescribed Schedules/Formats only. Any information indicated other than the prescribed schedules/formats shall not be entertained. The bid shall be evaluated on the basis of information furnished in the prescribed Schedules/Formats.

21. This specification includes Volume-I (along with Schedules) and Volume-II.

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RAJASTNAN SOLAR PARK DEVELOPMENT COMPANY LTD
(A GOVT. OF RAJASTHAN UNDERTAKING COMPANY)

TURNKEY PROJECT FOR

DESIGN, SUPPLY, INSTALLATION AND COMMISSIONING OF ABT ENERGY METERS & ITS ASSOCIATED SYSTEM, ACQUISITION OF DATA AND ITS COMMUNICATION / TRANSMISSION TO THE DESIGNATED LOCATIONS.

Volume-I
(Part-I)

SPECIFICATION
NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

INSTRUCTIONS TO BIDDERS

(ITB)

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

VOLUME-I

PART-I

INSTRUCTIONS TO BIDDERS

1.0 GENERAL INSTRUCTIONS

1.1. THE RAJASTHAN SOLAR PARK DEVELOPMENT COMPANY LTD (RSDCL), JAIPUR herein after called 'OWNER' will receive bids in respect of design, supply, installation and commissioning of ABT energy meters & its associated system, acquisition of data and its communication / transmission to designated remote sites. Bidders shall prepare bids in accordance with these instructions and furnish their offer.

2.0 QUALIFYING REQUIREMENT OF BIDDER

Bidder shall be required to fulfill qualifying requirements detailed here under:

2.1 TECHNICAL CRITERIA:

EXPERIENCE:

The bidder must be a manufacturer of energy meters including ABT meters having manufacturing experience of at least 2 years during last seven years immediately preceding the date of opening of Technical part of the bid. The bidder is also required to furnish a performance certificate of at least 6 Nos. ABT meters from user (s) for successful performance for a minimum period of one year during last seven years immediately preceding the date of opening of Technical part of the bid.

OR

The bidder must have executed the work of at least one telemetering scheme at EHV substation during last seven years by installing at least ABT meters, RTU/ DCU, Modem with GPRS/ other system, PC etc. and have transmitted the data to remote location successfully.

2.2 FINANCIAL CRITERIA:

For the purpose of bid, bidders shall have to meet the following minimum financial criteria:-

FINANCIAL CRITERIA	Turn-over (Rs. in Lakhs)
Minimum average annual turn-over for the best 3 financial years of last 5 financial Years.	**100.00**

2.3 SUPPORTING DOCUMENTS EVIDENCING CAPABILITIES:-

To be qualified for award, bidder shall provide satisfactory evidence to the owner towards their capacity and adequacy of resources to implement the contract effectively. Bids shall include the following information:

a) In order to establish compliance of above technical & financial criteria, the bidder shall furnish original/notarized copy of C.A. certificate. The C.A. certificate should also have the membership No. and the address of the Chartered Accountant issuing such certificate. The certificate should be signed by the bidder or by authorized representative of the firm and then scanned copy must be uploaded along with online bid. Self attested **c**opies of Purchase orders, Work orders, commissioning certificates **/** taking over certificates**/** performance certificates from the user/owner shall also be acceptable for evaluating technical criteria.

b) Authority to seek reference from the bidder's banks.

c) Information regarding any current litigation in which the bidder is involved, the parties concerned and disputed amount.

d) The successful bidder shall be required to submit the plan for carrying out the work.

2.6 OTHER DISQUALIFICATION CRITERIA:

(a) Even though the bidder meets the above qualifying criteria, they are subject to be disqualified if they have:

i) made misleading or false representation in the forms, statements and attachments submitted in proof of the qualification requirements and/ or

ii) record of poor performance such as incompletion of projects awarded in past / inordinate delays in completing the contract earlier awarded by RSDCL or litigation history or blacklisting etc.

(b) A bidder can submit only one tender in this tender enquiry. In case, any bidder furnishes more than one tender in this tender enquiry then all such multiple bids are liable to be rejected.

2.7 The above stated requirements are a minimum and the owner reserves the right to request for any additional information. Company also reserves the right to reject the proposal of any Bidder, if in the opinion of the owner, the qualification details are incomplete or the Bidder is found not qualified to satisfactorily perform the contract then his price bid shall not be opened.

2.8 Company reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

2.9 Company does not bound itself to accept the lowest or any of the bids and reserves the right to accept any bid or reject any or all bids without assigning any reason thereof.

2.10 Not withstanding anything stated above, the owner reserves the right to assess Bidder's capability and capacity to perform the contract, should circumstances warrant such an assessment in the overall interest of the owner.

3.0 COST OF BIDDING

3.1 The Bidder shall bear all costs and expenses associated with preparation and submission of its bid including post bid discussions, technical and other presentation etc. and the Owner will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. THE BIDDING DOCUMENTS

4.0 CONTENTS OF BIDDING DOCUMENT

4.1 The goods and service required, bidding procedures and contract terms are prescribed in the Bidding Document.
In addition to the invitation for bids, the bidding document is a compilation of the following sections:

a) Instruction to Bidders-Section ITB (Volume-I)
b) General Conditions of Contract - Section GCC (Volume-I)
c) Bid Form and Price Schedules (Volume-I)
d) Technical Specifications for metering system (Volume-II)

5.0 UNDERSTANDING OF BID DOCUMENTS

5.1 A prospective Bidder is expected to examine all instructions, forms, terms and specifications in the Bid Document and fully inform himself as to all the conditions and matters which may in any way affect the scope of work or the cost thereof. Failure to furnish all information required by the Bid Document or submission of a Bid not substantially responsive to the Bid Document in every respect will be at the Bidder's risk and may result in the rejection of its bid.

6.0 CLARIFICATIONS ON BID DOCUMENTS

6.1 If the prospective bidder finds discrepancies or omissions, in the specifications and document or is in doubt as to the true meaning of any part, he shall at once make a request, in writing, for an interpretation/ clarifications to the Owner. The Owner, then will issue interpretation and clarifications as he may think fit in writing. After receipt of such interpretations and clarifications the bidder may submit his bid but within the time & date as specified in the invitation to bid. All such interpretations & clarifications shall form a part of the Bidding Documents and shall accompany the Bidder's proposal. A prospective bidder requiring any clarification on bidding document may notify the owner in writing. The owner will respond in writing to any request for such clarification of the bidding Document which it receives not later than fifteen (15) days prior to the deadline for submission of bids prescribed by the owner. Written copies of the owner's response (including an explanation of the query but without identifying its source) will be sent to all prospective bidders which have received the bidding document.

Submission of the Bid shall be deemed to be the conclusive proof of the fact that the Bidder has acquainted himself and is in agreement with all the instructions, terms and conditions governing the specification, unless otherwise specifically indicated/ commented by him in the Bid.

6.2 Verbal clarifications and information given by the owner or his employee(s) or his representative(s) shall not in any way be binding on the owner.

7.0 AMENDMENT TO BIDDING DOCUMENT

7.1 At any time prior to the deadline for submission of bids, the owner may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding document by amendment(s). Such revision or amendment, if any will be communicated to all the Bidders through corrigendum(s) on **http://eproc.rajasthan.gov.in** **as** amendment or addenda to this invitation of the tender and it shall be binding on them.

7.2 Tenderers are required to immediately download any such amendment. It will be assumed that the information contained therein has been taken into account by the Tenderer in its tender.

7.3 In order to afford prospective bidders reasonable time to take the amendment into account in preparing their bids, the owner may, at its discretion extend the deadline for the submission of bids in which case, the Company will notify all tenderers on website of the extended deadline, for submission of tenders.

7.4 Such amendments, clarifications etc, shall be binding on bidders and will be given due consideration by the bidders while they submit their bids and invariably enclose such documents as a part of the bid.

C. PREPARATION OF BIDS

8.0 LANGUAGE OF BID

The bid prepared by the bidder and all correspondence and documents relating to the bid, exchanged by the bidder and the owner, shall be written in the English/Hindi language, provided that any printed literature submitted by the bidders may be written in other language so long as accompanied by an English/Hindi translation of its pertinent passages. Failure to comply with this may disqualify a bid. For purposes of interpretation of the bid, the English/Hindi translation shall govern.

9.0 LOCAL CONDITIONS

9.1 It will be imperative on each bidder to fully inform himself of all local conditions and factors of sites, including condition of all locations under consideration. The owner shall not entertain any request for clarification from the bidders, regarding such local conditions of sites.

9.2 It must be understood and agreed that such factors have properly been investigated and considered while submitting the proposals. No claim for financial adjustment to the Contract awarded under this specification and documents will be entertained by the owner. Neither any change in the time schedule of the contract nor any financial adjustments arising thereof shall be permitted by the owner, which are based on the lack of such clear information or its effect on the cost of the works to the bidder. Any information thus had or otherwise obtained from the purchaser or the Engineer shall not be in any way relieve the Contractor from his responsibility for the supplying of the equipments and executing the work in terms of the contract including all details and incidental works and supply all accessories or apparatus which may not have been specifically mentioned in the contract but necessary for ensuring complete erection, safe and efficient working of metering system, without any extra cost/charges, if he shall have any doubt as to the meaning of any portion of the general condition and specification, he shall before signing the contract or commencement of work, whichever is earlier, set- forth the particulars thereof and submit them to the Engineer in writing in order that such doubt may be removed.

10.0 DOCUMENTS COMPRISING THE BID TO BE UP-LOADED ON WEBSITE

The Bid shall be accompanied with the following schedules, documents and the fact of their having been uploaded should be as per tender specification. All tenders and accompanying documents will have to be digitally signed and submitted in time as specified on **http://eproc.rajasthan.gov.in.** The Bid which is not accompanied by any or all of the following schedules, documents or is accompanied by incomplete Annexures /Schedules is liable for rejection:

A. Cover-1 (.pdf) : FEE (scanned copies)

(i) Proof of depositing cost of tender specification.
(ii) Proof of submitting processing fee.
(iii) Proof of depositing of complete Bid Security (through DD/Banker's Cheque) and in the form of Bank Guarantee for an amount as specified in the specification.

B. Cover-2 (.pdf): TECHNO COMMERCIAL BID (scanned copies to be uploaded)

i) **Status of the Bidder** i.e. Confirmations regarding the status of the Bidder as per the provisions of the Qualification Requirements of the tender documents.

ii) **Details of Past Experience** i.e. Details of Past experience of manufacturing of meters including ABT meters or having executed the work of telemetering scheme as per Qualification Requirements of the tender documents.

iii) **Performance criteria** i.e. Performance certificates in respect of required number of ABT meters as specified in the Qualification Requirements of tender documents or a document establishing the execution of work of telemetering scheme to be arranged from owner/ purchaser.

iv)**Assured access** i.e. Confirmation regarding bidder having the assured access for supply of various equipments /material as specified in the tender documents.

v)**Financial Criteria**: – Details regarding meeting the financial criteria in respect of minimum average Annual turn-over for the best three financial years of last 5 financial years. The scanned copies of supporting documents for the same shall be uploaded as detailed below:-

(a) C.A. Certificate indicating the Annual turnover of the firm for best 3 years in the last five years. The C.A. certificate should have membership number and address of the Chartered Accountant issuing such certificate.
(b) Audited Financial Statement of the firm including Balance sheet, Profit & Loss and its annexures, for last five years.

vi) **Schedule-II**--Confirmations regarding validity of offers, Prices, Quantities, completion period and the terms & conditions as well as technical stipulations of the tender specification.

vii) **Bid –Form**-As per Schedule-II.

viii) Information required from bidders along with their Techno-Commercial Bid as per Schedule-III.

ix) **Current Litigation**:- Information regarding any current litigation in which the bidder is involved, the parties concerned and disputed amount involved.

x) **Details of infrastructure**:-Details to have all infrastructures, tools & tackles, testing equipments along with experienced project manager and qualified erection engineers etc.

xi) **Schedule-IV**:-Deviations from Purchaser's specification (Technical and Commercial) in Schedule-IV of Tender Documents. Deviations indicated elsewhere will be ignored.

xv) **GTP**:- GTP of various equipment/ items for metering system are to be furnished by the bidder.

xvi) **Bidder's contact details**- Name & correspondence address of the bidder along with phone /Fax No. & e-mail address.

xvii) Other details/information, if bidder require to furnish.

The above information should be prepared very carefully since it will be the basis for the pre-qualification of bidders. Only relevant and to the point information shall be indicated. Failure to provide any required information may lead to the rejection of the offer. All above documents are to be digitally signed on each & every page by the authorized representative of the firm after filling requisite information/details desired in the specification & PQR. Departure from specification (Technical & Commercial) shall only be given in Schedule-IV. Deviations indicated elsewhere will be ignored.

C. Cover-3 (.xls) : (a) PRICE BID: PRICE SCHEDULES (.xls)

(Schedule-A (BOQ1) for supply of material/equipments and Schedule-B (BOQ2) for erection, testing & commissioning of metering system)

This cover consists of price schedules (BOQs) i.e. BOQ1 and BOQ2 (Schedule-A and B) The tenderer must quote the prices for supply of material/ equipments and erection, testing & commissioning in the manner as indicated in the Price schedules as per specification, failing which tender is liable for rejection.

These schedules must be digitally signed by the authorized representative of the firm. The opening date for this shall be intimated later on.

11.0 SCOPE OF THE PROPOSAL

11.1 The scope of the proposal shall be on the basis of a single bidder completely covering design, engineering, supply of material, equipments, its successful erection, testing and commissioning as specified under the accompanying commercial and technical specification. It will include the following:-

a) All design, engineering of ABT meters and associated equipments/ items.
b) Providing of all type of engineering, drawings related to metering system & technical data for owner's approval.
d) Vendor & subcontractor's name for owner's approval.
e) Complete manufacture, assembly including shop testing, inspection and testing of material and equipments (before supply and delivery).
f) Packing and transportation of equipments, material from manufacturer works to desired sites.
g) Receipt, storage, preservation and conservation of equipments at sites.
h) Pre assembly if any, erection, testing and commissioning of all equipments.

11.3 Bids not covering the above entire scope of works may be treated as incomplete and hence rejected.

12.0 BID PRICE

12.1 (a) The bidder shall quote prices on FOR Destination basis for supply of material/equipments in respective schedule of prices, (Schedule-A i.e. BOQ1) available in cover-3 (.xls) of

specification. For supply of material/ equipments, the bidder shall quote the same Ex-works. The rates / prices quoted shall include the following:

(i) Packing and forwarding charges.
(ii) Insurance charges.
(iii) Freight charges including unloading & stacking.
(iv) All duties & Taxes.

For the supply items which are to be manufactured and supplied by the bidders, all components of prices and Taxes (ED, CST/VAT, ET if applicable) and F&I etc. shall be indicated as per the schedules enclosed.

For bought out items, total FOR site price (inclusive of all taxes / duties, etc.) shall be quoted. The ex-works price shall be inclusive of all cost as well as duties and tax (viz. custom duties & levies, Excise duties, Sales tax/VAT etc.) but exclusive of entry tax and Freight & Insurance charges. The entries of column for Excise duty and CST/VAT for bought out items must be kept as 0.00%. However, the bidder should clearly indicate the Freight & Insurance charges & Entry Tax of bought-out items also in the respective column of the price schedules.

(b) For Erection/ installation, Testing & commissioning, the bidder should quote their unit prices including all taxes/duties & other charges except service tax which shall be quoted in the respective column as per ITB in the respective price schedule i.e. Schedule-B (BOQ2-Erection/ installation, Testing & Commissioning), available in cover 3 (.xls) of specification. Though the AMC charges will not be considered for bid evaluation but bidders are required to quote the charges along with service tax in the respective columns for which the RSDCL may place a separate order if it is deemed appropriate.

13.0 ALTERNATE PROPOSALS

The bidder shall quote their proposals strictly conforming to the technical details, design as specified in the specification. Any offer based on the alternate design shall not be considered. Alternative proposals, if any, shall be clearly stated in the covering letter and shall accompany each copy of the Bid.

14.0 PRICE BASIS

14.1 The bidder shall quote price for the entire scope of works covered under the technical and commercial specification as required in the bid proposal sheets. The prices of all items are required to be quoted on “FIRM” basis independent of any variation.

14.2 Bidder shall indicate bid prices in Indian Rupees only. Prices indicated in foreign currency will be rejected out rightly.

15.0 TAXES, DUTIES & LEVIES:

15.1 All custom duties, excise duties, sales taxes, entry tax and other taxes duties/ levies as per Govt. rules payable by the bidders in respect of the transaction between the bidder and their vendors/sub suppliers while procuring any components sub assemblies, raw-materials and equipment shall be included in the bid price and no extra claim on this behalf will be entertained by the owner.

15.1.1 The RST/ CST & VAT shall be applicable as per prevailing Govt. rules. The bidder shall furnish the following certificate for payment of CST/ RST:

"Certified that the goods on which Sales Tax has been charged, have not been exempted under the Central Sales Tax Act or the State Sales Tax Act or the rules made therein, and that the sales tax as charged or billed on these goods are correct under the provisions of the relevant act or the rules made therein, and that in case of supplies against regular contract, the relevant contract includes a specified provision that the sales tax is payable by the RSDCL."

"Certified further that we _____are registered as a dealer in the State of _____ and registration No._____ and No._____ for the purpose of Central/ State Sales Tax."

15.1.2 In case the sales tax assessment of the contractor become due before completing the entire supplies against the order, certificate for VAT and C form(s) for concessional rate of VAT & CST respectively, if applicable for RSDCL, for the supplies made shall be issued on specific request of the supplier made at least 15 days before the due date of sales tax assessment on fulfilling the requirement of sub clause(s).

15.2 Sales tax as applicable as per sales tax Act, excise duty, entry tax , local taxes and other levies in respect of the transactions between the owner and the contractor under the contract, if any shall be included in the bid price.

Whenever ex-works price is quoted exclusive of Excise duty and/or VAT on the transaction between the owner and the contractor, then the due credit under the CENVAT (Central value Added Tax)/ VAT scheme as per the relevant Government policies wherever applicable, shall be taken into account by the bidder while quoting bid price.

In respect of bought-out finished items, which shall be despatched directly from the sub-vendor's works to the Company's site (sale-in-transit), ex-works price shall be inclusive of all cost as well as duties and tax (viz. custom duties & levies, Excise duties, Sales tax/VAT etc.) paid or payable. While quoting the ex-works price, inclusive of excise duty and/or VAT, the due credit under the CENVAT (Central value Added Tax)/ VAT scheme as per the relevant Government policies wherever applicable, shall be taken into account by the bidder.

15.3 For bought out items, the billing may be done against requisite form on transfer of document basis so as to avail the facility of concessional sales tax, if applicable. The payment would be released against the certificates issued by the concerned representative of Company that the "material have been brought at site by the contractor" as would be done in case of other supply items.

15.4 <u>VAT-47 Forms: Not applicable.</u>

15.5 The TDS Income tax and surcharge on Income tax will be deducted from the bills/invoices of the contractor at the prevailing rates and as per the applicable laws on the composite value of contract consisting of prices for supply of material/ equipments and erection, testing & commissioning charges. However, necessary TDS certificate(s) shall be issued by Company's Paying Authority. Any liability arising on account of income tax will be to the contractor's account. Any statutory variation in the Income tax will be to the contractor's account.
Besides, if any other existing tax is payable, same shall be on contractor's account.

15.6 Entry tax, Service tax & Work contract tax :

15.6.1 The following taxes are applicable on the supply/ works under consideration:

15.6.2 Work Contract tax

The work contract tax will be deducted from the bills/ invoices of the contractor at the applicable rates on the composite value of the contract consisting of prices for supply of material/ equipments and erection/ installation, testing & commissioning charges. Any liability arising on account of work contract tax will be to the contractors account. Any statutory variation in the work contract tax will be to the contractor's account. The bidder shall quote the prices inclusive of applicable work contract tax.

15.6.3 Service tax

The bidder shall quote the prices and applicable service tax for erection testing and commissioning part. Any statutory variation in the service tax during the scheduled commissioning period will be to the RSDCL's account. The bidder shall give service tax registration number. Service Tax will be deducted at source on reverse charge basis as per applicable laws. The Service tax with appropriate authority within stipulated period shall be the bidder's liability.

15.6.4. Entry tax

The Rajasthan Government has imposed entry tax on certain goods. The entry tax is applicable on total FORD price of the goods. The entry tax will be deposited by RSDCL to Govt. of Rajasthan. However, an amount equivalent to applicable entry tax will be deducted from the bills of bidder /contractor as per prevailing Govt. rules. The bidder shall quote the prices inclusive of impact of entry tax.

15.7 All contracts / Contractors with the Government shall require registration of workers under the Building & other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and extension of benefit to such workers under the Act. Deductions of cess at source will be made as per provisions of the said Act, in force from time to time.

15.8 Any new taxes and duties (except in case of supply of bought out items), if imposed by the Govt. after submission of tender but during contractual completion period shall be paid by RSDCL at actual against documentary proof. After contractual completion period, any new taxes and duties, levies shall be borne by the contractor and not by RSDCL.

In case of bought out items, any new taxes & duties imposed by the Govt. shall be borne by the contractor.

15.9 The payments of Excise duty & Cess, thereon and sales tax / VAT (in case of items manufactured by the bidder) shall be made against the documentary proof/ evidence, at the rate applicable on scheduled date or actual date of despatch, which-ever is lower. These shall also be subjected to the provision under clause 15.9.1 below.

15.9.1 For supply of material being manufactured by the bidder, Excise Duty & Cess thereon and sales tax / VAT in case of direct transactions between the owner and contractor, shall be paid as applicable during contractual delivery period or actual delivery period whichever is lower against submission of documentary evidence.

15.9.2 In case of bought out items, all taxes and duties shall be included by the bidder in their quoted Ex-works prices in the price schedules. No statutory variation in taxes and duties in case of supply of bought out items shall be paid by RSDCL.

16.0 **PRICE ADJUSTMENT:** All the prices shall be “firm” only.

17.0 **TIME SCHEDULE:**

17.1 The basic consideration and the essence of the Contract shall be strict adherence to the time schedule for completing the specified works.

17.2 The owner’s requirements of completion schedule for the works are mentioned in the Specification.

17.3 The completion schedule as stated in the Specification shall be one of the major factors in consideration of the bids.

17.4 The owner reserves the right to request for a change in the work schedule during pre award discussions with successful bidder.

17.5 The purchaser reserves the right to defer the completion period. The period so deferred shall not be reckoned as delay in completion of contract in terms of clause 'Recovery for Delay in completion of contract.'

17.6 Non availability/ scarcity/ non-allocation of raw material shall not constitute as a `force majeure condition ' in any case and it will be sole responsibility of the Contractor to arrange the raw material for timely execution of the order.

17.7 If the basic scope of work undergoes changes during execution stage resulting into additional scope over that originally provided for which the contractor insists for additional/separate completion period/schedule, such extra completion schedule for the same shall be finalized in consultation with the contractor.

17.8 In case the scope of work does not change but the contractual completion period is extended because of delay in commencement/execution of the work on account of non-fulfillment of obligations by RSDCL or any other reason not attributable to the contractor, the schedule shall be suitably revised as per the extended completion period.

18.0 **CONTRACT QUALITY ASSURANCE**

18.1 The bidder shall include in his proposal, the quality Assurance programme containing the overall quality management and procedures which he proposes to follow in the performance of the works during various phases as detailed in relevant clause of the Specification.

19.0 **INSURANCE**

The bidder's insurance liabilities pertaining to the scope of works are detailed out in clauses titled insurance in General terms and conditions of contract of this volume I . Bidder's attention

is specifically invited to these clauses, bid price shall include all the cost in pursuance of fulfilling all the insurance liabilities under the contract.

20.0 **BID SECURITY**

20.1 The Bidder shall furnish as part of its bid, bid security in cash/DD and in shape of B.G. for an amount as specified in the Specification.

20.2 The bid security is required to protect the Owner against the risk of Bidder's conduct which would warrant forfeiture of bid security, in pursuant to para 20.7.

20.3 The bid security shall be denominated in Indian Rupees only and shall be furnished in the shape of B.G. from an Indian scheduled/nationalized bank of 80% amount of Bid Security (which shall be in the favour of MD, RSDCL) on the Rajasthan State Non Judicial Stamp Paper of Rs.100/- or as per Govt. Rules, purchased in name of the executant's Bank duly authenticated either by a first class Magistrate or Notary Public or directly confirmed by the issuing Bankers shall be furnished valid for 180 days with the grace period of 90 days (Bid bank guarantee format is enclosed at Annexure-IV, Vol.I). The balance 20% amount shall be deposited in cash or by Crossed Bank draft in favour of RSDCL**,** Jaipur payable at Jaipur for the amount as specified in the Specification**.** The tenderer may also furnish entire amount of Bid Security in cash, if he so desires.

20.4 Any Bid not accompanied by a copy of receipt for Bid Security/ crossed bank draft/Bid bank guarantee (Original) shall be rejected and the Bid will not be opened. Any bid not secured in accordance with para 20.1 and 20.3 above will be rejected by the Owner as non responsive.

20.5 In case of unsuccessful bids, the Bid Security will be refundable after finalization of the Bid.

20.6 The Successful Bidder's bid security will be discharged upon the Bidder, executing the Contract and furnishing the security & performance Guarantee as per Specification.

20.7 The bid security may be forfeited:

a) If a bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Form; or

b) In the case of a successful Bidder, if the Bidder fails:
i) to sign Contract agreement or
ii) to furnish the security & performance Guarantee.

20.8 The proof for furnishing bid security shall be submitted along with the bid. Any bid not accompanied by the required bid security in accordance with provisions of this clause will be rejected by the Owner and shall not be opened.

20.9 No interest shall be payable by the Owner on the above bid security.

21.0 **PERIOD OF VALIDITY OF BIDS**

21.1 Bids shall remain valid for a minimum period of 120 days after the date of opening of techno-commercial bids**.** A bid valid for a shorter period will be rejected by the Owner as non responsive.

21.2 In exceptional circumstances, the Owner may solicit the Bidder's consent to an extension of the period of validity. The request and the response thereto shall be made in writing (including cable or telex or Fax).The period for return of bid security amount provided under clause 20.0 shall also be extended by the same period as the extension in the validity of the bid. A bidder may refuse the request without forfeiting his bid security. A bidder granting the request will not be required or permitted to modify its bid.

22.0 BID FORMAT, SUBMISSION AND OPENING OF BIDS.

(a) Bidder shall submit their bid in electronic format digitally signing the same. Bidder shall procure Digital Signature Certificate (DSC) as per IT Act - 2000.

(b) The documents listed in ITB (Instructions To Bidders) clauses, along with addendum's issued till the date & time of bid submission, shall be filled by the bidder to bind the bidder to contract. All pages of the bid shall be stamped and digitally signed.

(c) All omissions in the price schedule will be serially numbered and digitally attested by the officer opening the bids, so as to make further dispute impossible on this score.

(d) Bidders who have to participate in this tender will have to register on http://eproc.rajasthan.gov.in. Further, Bidders who have to participate in online tenders will have to procure digital signature certificate as per IT act so that they can sign their electronic bids.

(e) Before electronic submission of tender, it should be ensured that all documents, schedules, annexures, certificates, informations etc. of the tender specification are digitally signed by the tenderer.

(f) All tenders, in which any of the prescribed conditions are not fulfilled or which have been vitiated by errors in calculations, totaling or other discrepancies or which contain over writing in figures or words or corrections not initialed and dated, may be liable to rejection.

(g) The electronically received bids will be opened in the office of the Director (Tech.)/ Conference Room on stipulated date & time in the presence of such tenderers or their authorized representative, who choose to be present. The system does not permit electronic submission of late tenders after the due date & time.

(h) The Bids shall not be witnessed by a bidder who himself have not participated.

(i) Should the date fixed for opening of the Bids is declared as a public holiday, the Bids shall be opened on the next date on which office re-open after such holiday(s).

23.0 **SIGNATURE ON BIDS**

The Bid must contain the name, designation and place of business of the person or persons making the Bid and must be submitted online, placing them in 3 covers after filling & signing digitally with his DSC (Digital signature.

24.0 DEADLINE FOR SUBMISSION OF BIDS

24.1 Bids must be received **on line** by the owner on the website http://eproc.rejasthan.gov.in up to the specified date & time as mentioned in the cover pages but not later than the time and date mentioned in the invitation to bid.

24.2 The Owner may, at its discretion, extend this deadline for the submission of bids by amending the bidding document in which case all rights and obligations of the owner and bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

25.0 MODIFICATION AND WITHDRAWAL OF BIDS

The bidder will not be allowed to withdraw its bid/offer after its submission. However, the bidder may modify its bid prior to the deadline prescribed for submission of bids.

26.0 INFORMATION REQUIRED WITH THE PROPOSAL

26.1 The bids must clearly indicate the name of manufacturer, the type of model of each principal item of equipment proposed to be furnished and erected. The bid should also contain drawings and descriptive materials indicating general dimensions, materials from which the parts are manufactured, principals of operation, the extent of pre assembly involved , major construction equipment proposed to be deployed, method of erection and the proposed erection organisational structure.

26.2 The above information shall be provided by the bidder in the form of separate sheets, drawings, catalogues, etc.

26.3 Bid must contain sufficient descriptive material to describe accurately the equipment proposed. Such descriptive material and drawings submitted by the bidder will be retained by the owner. Any major departure from these drawings and descriptive material submitted will not be permitted during the execution of the contract without specific written permission of the owner.

26.4 Oral statements made by the bidder at any time regarding quality, quantity or arrangement of the equipment or any other matter will not be considered.

26.5 Standard catalogue pages and other documents of the bidder may be used in the bid to provide additional information and data as deemed necessary by the bidder.

26.6 In case the "proposal" information contradicts specification requirements, the specification requirements will govern, unless otherwise brought out clearly in the technical commercial deviation schedule (Schedule-IV). Deviations indicated elsewhere except these schedule shall not be considered.

26.7 In the event of order, the contractor shall furnish the original/notarized photostat copies of the latest type test certificates from a Govt./a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accreditation Co-operation (in case of foreign laboratories) or the certificate of type test conducted at manufacturer's works duly witnessed by representative of any Electricity Board/Company/ Govt. agency/PGCIL/NTPC (wherever specified in technical specification for particular items) or the certificate of type test conducted in the manufacturer's own lab located in the foreign country duly witnessed by independent agency for all

the type tests wherever prescribed in the relevant latest editions of Indian standards/International standards. The type test certificates should not be older than 7 years from the date of bid opening. However, no separate type test charges shall be paid to the bidders.

26.8 In case of any specific alternative requirement of type test the same shall be furnished as per specification.

26.9 The Bidder/supplier shall be required to furnish the routine/manufacturer(s) factory test certificate(s) for the test carried out during manufacture in accordance with the latest standard specifications.

E. BID OPENING AND EVALUATION

27.0 OPENING OF BIDS BY OWNER

27.1 The owner will open bids (Techno-commercial) on line on specified date & time on the website as mentioned in the cover pages.

27.2 The price bid of only technically & commercially qualified bidders shall be opened **on line** on subsequent date. The time & date of opening of price bid shall be conveyed to the qualified bidders separately.

28.0 CLARIFICATION OF BIDS

To assist in the examination, evaluation and comparison of bids the owner may, at its discretion, ask the bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in the price or substance of the bid shall be sought, offered or permitted.

29.0 PRELIMINARY EXAMINATION

29.1 The Owner will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

29.2 Before opening the price bid of competent bidders, the competency of bidders shall be decided on the basis of their past experience, meeting the specified qualifying requirement, commercial & technical specification.

29.3 If any arithmetical error(s) is found in price bid, the same shall be rectified for the purpose of evaluation & comparison of bids and for placing orders. If there is discrepancy between the quoted unit price / the total price and the unit price/total price worked out on the basis of quoted ex-works price plus indicated taxes, quantities, F&I etc. then the price that is beneficial for Company shall be considered. Rates of taxes, if quoted more than the maximum applicable rates for RSDCL then the same shall be corrected up to the maximum applicable rates for RSDCL. In case present applicable Excise duty inclusive of Cess & CST/VAT is quoted less than the maximum rate, then the Excise duty inclusive of Cess & CST/VAT shall be absorbed by the bidder up to the maximum rate during the currency of the contract. If the bidder does not accept the correction of the errors as above, his bid will be rejected and the amount of bid security forfeited.

The bidder should ensure that the prices furnished in various price schedules are consistent with each other. In the case of any inconsistency in the prices furnished in the specified price

schedules to be identified in Bid Form for this purpose, the owner shall be entitled to consider the highest price for the purpose of evaluation and for the purpose of award of contract use the lowest of the prices in these schedules.

29.4 Prior to the detailed evaluation, the owner will determine the substantial responsiveness of each bid to the bidding document. For purpose of these clauses, a substantially responsive bid is one which conforms to all the terms and conditions of the bidding document without material deviations. A material deviation is one which affects in any way the prices, quality, quantity or delivery period of the equipment or which limits in any way to the responsibilities or liabilities of the bidder of any right of the owner as required in these specifications and documents. The Owner's determination of a bid's responsiveness shall be based on the contents of the bid itself without re-course to extrinsic evidence.

29.5 A bid determined as not substantially responsive will be rejected by the owner and may not subsequently be made responsive by the bidder by correction of the non conformity.

29.6 The owner may waive any minor informality or non or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any bidder.

30.0 **EVALUATION & COMPARISON OF BIDS**

30.1 The bids shall be compared on the basis of prices (i.e. for supply portion and price for services to be rendered as quoted by the bidder) for the entire scope of the proposal as defined in the bidding document, in respect of supply portion & the prices for the erection/ installation, testing, commissioning as mentioned by the bidders in the schedules.

30.2 All evaluated bid package prices of all the bidders shall be compared among themselves to determine the lowest evaluated bid and, as a result of this comparison, the lowest bid will be selected for the award of the Contract.

30.3 In case, it is found in the price bid that the bidder has not quoted for some of the item(s) indicated in the BOM of specification in that case no loading for such item(s) shall be done for the purpose of evaluation and comparison of bids. In the event of order, prices of such item(s) will be treated ‘Zero’ and no payment will be made for such item(s).

F. AWARD OF CONTRACT

31.0 **AWARD CRITERIA**

31.1 The owner will award the contract to the successful bidder whose bid has been determined to be substantially responsive and has been determine as the lowest evaluated bid, provided further that the bidder's determined to be qualified to perform the contract satisfactorily. The owner shall be the sole judge in this regard.

32.0 **OWNER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS.**

The owner reserves the right to accept or reject any bid, to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the owner's action.

33.0 NOTIFICATION OF AWARD

33.1 Prior to the expiration of the period of bid validity and extended validity period, if any, the owner will notify the successful bidder(s) in writing by registered letter or by cable or telex or FAX/ mail, to be confirmed in writing by registered letter, that its bid has been accepted.

33.2 The notification of award will constitute the formation of the contract.

34.0 SIGNING OF CONTRACT

34.1 At the same time as the owner notifies the successful bidder that its bid has been accepted, the owner will send the bidder the detailed letter of Award, incorporating all agreements between the parties. The Contractor shall have to execute the contract documents within a period of **15 days** from the date of issue of the order in triplicate, in prescribed form (copy enclosed) on Rajasthan State Non- judicial stamp paper of worth Rs. 5000/- or as applicable as per stamp duty in Govt. of Rajasthan along with copy of the order, copy of General Conditions of Contract etc. including Technical specification. It is advised that each and every page of relevant documents is to be signed by authorized person. It may however be ensured that one copy of the order and other documents as above, are signed by an authorized person holding valid power of attorney and returned to the Director (Tech.), RSDCL, Jaipur. The power of attorney on non judicial stamp paper worth Rs. 100/- (attested by the Notary Public) in favour of person signing these documents, duly notarized in original be also submitted along with the above documents.

34.2 No payment shall be released without acceptance of the contract agreement, performance bank guarantee, security bank guarantee**.**

34.3 The bidder will prepare the Contract Agreement as per the proforma enclosed at Annexure-III to this Volume-I and the same will be signed within 15 (fifteen) days from the date of issue of order.

34.4 The Contractor and COMPANY shall as soon as possible, unless otherwise agreed upon, enter into a signed agreement for the proper fulfillment of the contract. The expenses of completing and stamping the agreement shall be paid by the Contractor and the COMPANY shall be furnished free of charge with an executed stamped agreement after the Bid has been accepted by the COMPANY. All orders/ instructions to the Contractor shall, except as herein otherwise provided, be given by the Engineer on behalf of the COMPANY.

35.0 SECURITIES (DEMAND DRAFT/ BANK GUARANTEES)

COMMON FOR ALL TYPES OF BANK GUARANTEES

a) All the bank guarantees towards Security Deposit & performance security shall have to be furnished from an Indian scheduled/nationalized bank on the Rajasthan State Non judicial stamp paper of Rs.100.00 (purchased in the name of guarantor/issuing bank) duly authenticated either by a first class Magistrate or Notary Public or directly confirmed by the issuing Bank towards Security/Performance security in favour of "The MD, RSDCL, Jaipur". All the Bank Guarantees shall be submitted to the purchaser.

b) The bank guarantees should remain valid upto the last day of calendar month and be furnished in whole rupees.

c) The contractor shall keep the Bid Bank Guarantee valid till the Performance Security submitted by him is accepted by the purchaser.

d) Bank charges or any other charges, if any, shall be to the Contractor's account. If the Contractor fails to provide the Security within the period specified, such failure shall constitute a breach of the Contract and the COMPANY shall be entitled to make other arrangements at the risk and expenses of the Contractor and the Earnest money deposited by the Contractor shall stand forfeited by the Company.

e) All the bank guarantees towards Security Deposit & Performance security shall be paid to COMPANY on first demand without conditions or proofs.

f) The Bank Guarantees shall be furnished by the bidder/ contractor, after checking the same correctly.

36.0 CONTRACT PERFORMANCE GUARANTEE

36.1 As a contract performance security, the successful bidder, to whom the work is awarded, shall be required to furnish within a period of 15 (Fifteen) days from the date of issue of the order a performance guarantee from an Indian scheduled/ nationalised bank, in the form attached as Annexure-II to this Volume-I in favour of the owner. The guarantee amount shall be equal to ten percent (10%) of the total contract price including prices of supply order, erection/ installation, testing & commissioning charges**.** The Performance Security shall be kept initially valid till the expiry of the 12 months from the date of contractual commissioning and taking over of the complete system and shall be extended, without any extra charges to COMPANY, from time to time on intimation from the purchaser till 12 months beyond actual date of taking over of the system required under the contract and it shall guarantee the faithful performance of the contract in accordance with the terms and conditions specified in these documents and specifications. The warrantee/ guarantee shall be valid up to 90 days after the end of warrantee period.

36.2 The Performance Guarantee shall cover additionally the following guarantees to the Owner:

a) The successful bidder guarantees the successful and satisfactory operation of the equipment furnished and erected under the contract as per the specification and documents.

b) The successful bidder further guarantees that the equipment provided and installed by him shall be free from all defects in design, material and workmanship and shall upon written notice from the owner fully remedy free of expenses to the owner such defects as developed under the normal use of the said equipment within the period of guarantee specified in the relevant clause of the General Terms and Conditions of contract.

36.3 The contract performance guarantee is intended to secure the performance of the entire contract. However, it is not to be construed as limiting the damages under clause entitled "Equipment Performance Guarantee" in Technical Specifications, Volume-II and damages stipulated in other clauses in the Bid documents.

36.4 The performance guarantee will be returned to the contractor without any interest after expiry of guarantee period as indicated in GCC, after adjustment of recoveries, if any under the contract, unless the guarantee period is further extended as per requirement.

37.0 SECURITY GUARANTEE

In order to secure/assure due fulfilment of the contract, successful bidder, to whom the contract is awarded, shall be required to furnish within a period of 15 (Fifteen) days from the date of issue of the order security bank guarantee equivalent to 2% (two percent) of the total contract value including prices of supply order and erection/ installaion, testing & commissioning charges in cash or by crossed Bank draft (no interest shall be payable on such deposits) or by way of Bank Guarantee from an Indian scheduled/ nationalised bank, in the proforma attached at Annexure-I in favour of the owner. The security bank guarantee shall remain valid for a period of 90 (ninety) days after commissioning and handing over of the complete metering system to RSDCL complete in all respect and if required by the RSDCL, the validity of the Bank guarantee shall be extended, without any extra charges to RSDCL, for the period as desired.

Unless otherwise specifically required to be retained/forfeited by the RSDCL, the Security deposit shall be refunded on request of the Contractor after three months on completion of the entire work of metering system and handing over after commissioning to the satisfaction of the RSDCL.

If the Contractor fails or neglects to observe or perform any of his obligation under the contract, it will be lawful for the RSDCL to forfeit either in whole or in part at his absolute discretion, the Security deposit in the form of B.G / Demand Draft furnished by the Contractor.

38.0 GENERAL

a) The Contractor shall treat the details of the specification and other Bid documents as private and confidential and shall not reproduce without the written authorization of the RSDCL.

b) RSDCL does not bind itself to accept the lowest or any Bid or any part of the Bid and shall not assign any reason(s) for the rejection of any Bid or a part thereof.

c) The fact of submission of Bid to the RSDCL shall be deemed to constitute an agreement between the Bidder and RSDCL whereby such Bid shall remain open for acceptance by the RSDCL and Bidder shall not have option to withdraw his offer, impair or derogate the same. If the Bidder is notified during the period of validity of Bid that his Bid is accepted by the RSDCL, he shall be bound by the terms of agreement constituted by his Bid and such acceptance thereof by the RSDCL, until formal contract of the same Bid has been executed between him and the RSDCL in replacement of such agreement.

d) The successful Bidder shall have to execute the contract documents/agreement for the proper fulfillment of the contract. This shall be done by him and shall furnish such an executed stamped agreement free of charge.

e) Type test charges if required, the same shall be considered as in built in the quoted prices.

VOLUME-I

PART-II

GENERAL CONDITIONS OF CONTRACT

A. INTRODUCTION

1.0 DEFINITION OF TERMS

1.1 'The contract' means the agreement entered into between owner and contractor as per the contract agreement signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference there-in.

1.2 “Owner” or “purchaser” or “Company” shall mean the RSDCL, Jaipur, India and shall include their legal representatives, successors and assigns.

1.3 'Contractor' or 'Manufacturer' shall mean the bidder whose bid will be accepted by the owner for the award of the works and shall include such successful bidder's legal representatives, successors and permitted assigns.

1.4 'Sub-contractor' shall mean the person named in the contract for any part of the works or any person to whom any part of the contract has been sublet by the Contractor with the consent in writing of the Engineer and will include the legal representative , successors and permitted assigns of such person.

1.5 ‘Engineer’ shall mean the officer appointed in writing by the Owner/ RSDCL to act as Engineer from time to time for the purposes of the contract.

1.6 'Consulting Engineer' /'consultant' shall mean any firm or person duly appointed as such from time to time by the owner.

1.7 The terms 'Equipment', 'Stores' and 'Materials' shall mean and include equipment , stores and materials to be provided by the contractor under the contract.

1.8 'Works' shall mean and include the furnishing of equipment, labour and services, as per the specifications and complete erection/ installation, testing and putting into satisfactory operation including all transportation, handling, unloading and storage at the site as defined in the contract.

1.9 'Specifications' shall mean the specification and bidding document forming a part of the contract and such other schedules and drawings as may be mutually agreed upon.

1.10 'Site' shall mean and include the land and other places on, into or through which the works and the related facilities are to be erected or installed and any adjacent land, paths, street or reservoir which may be allocated or used by the owners or contractor in the performance of the contract.

1.11 The term 'Contract price' shall mean the lumpsum price quoted by the contractor in his bid with additions and 'or' deletions as may be agreed and incorporated in the letter of Award, for the entire scope of the works.

1.12 The term 'Equipment Portion' of the contract price shall mean the ex-works value of the equipment.

1.13 The term 'Erection portion' of the contract price shall mean the value of field activities of the Works including erection/ installation, testing and putting into satisfactory operation including successful completion of performance and guarantee test to be performed at site by the contractor including cost of insurances.

1.14 'Manufacturer's Works' or 'Contractor's Works'. shall mean the place of work used by the manufacturer, the contractor, their collaborators/associate or sub- contractors for the performance of the contract.

1.15 'Inspector' shall mean the owner or any person nominated by the owner from time to time, to inspect the equipment, stores or works under the contract and/or the duly authorised representative of the owner.

1.16 'Notice of Award of Contract/'Letter of Award'/'Telex of award' shall mean the official notice issued by the owner notifying the contractor that his bid has been accepted.

1.17 'Date of contract' shall mean the date on which notice of award of contract/letter of Award has been issued.

1.18 ‘Month’ shall mean the calendar month. 'Day' or ‘days 'unless herein otherwise expressly defined shall mean calendar day or days of 24 hours each.
A 'week' shall mean continuous period of seven (7) days.

1.19 ‘Writing’ shall include any manuscript, type written or printed statement, under or over signature and/or seal as the case may be.

1.20 When the words 'Approved'. 'Subject to Approval’, 'Satisfactory', ‘Equal to’,'proper'. 'requested', 'As directed'. 'where directed', 'when directed', 'determined by' ,'accepted ' , 'permitted', or words and phrases of like importance are used the approval, judgement, direction etc. is understood to be a function of the owner/Engineer.

1.21 Test on completion shall mean such tests as prescribed in the contract to be performed by the contractor before the work is taken over by the owner.

1.22 ' Start up' shall means the time period required to bring the equipment covered under the contract from an inactive condition, when construction is essentially complete, to the state ready for trial operation. The start up period shall include preliminary inspection and checkout of equipment and supporting sub-system, initial operation of the complete equipment covered under the contract to obtain necessary pre-trial operation data, perform calibration and corrective action, shut down, inspection and adjustment prior to the trial operation period.

1.23 'Initial operation' shall mean the first integral operation of the complete equipment covered under the contract with the sub-system and supporting equipment in service or available for service.

1.24 'Trial operation', Reliability test', Trial run', 'Completion test', shall mean the extended period of time after the start up period. During this trial operation period the unit shall be operated over

the full load range. The length of trial operation shall be as determined by the Engineer, unless otherwise specified elsewhere in the contract.

1.25 'Performance and guarantee test' shall mean all operational checks and tests required to determine and demonstrate capacity, efficiency and operating characteristics as specified in the contract documents.

1.26 The term 'Final Acceptance/Taking over' shall mean the owner's written acceptance of the works performed under the contract, after successful commissioning/completion of performance and guarantee tests, as specified in the accompanying Technical specification or otherwise agreed in the contract.

1.27 'Commercial operation' shall mean the conditions of operation in which the complete equipment covered under the contract is officially declared by the owner to be available for continuous operation at different loads upto and including rated capacity, such declaration by the owner, however, shall not relieve or prejudice the contractor of any of his obligations under the contract.

1.28 'Guarantee Period'/Maintenance period' shall mean the period during which the contractor shall remain liable for repair or replacement of any defective part of the works performed under the contract.

1.29 'Latent Defects' shall mean such defects caused by faulty design, material or workmanship which cannot be detected during inspection, testing etc. based on the technology available for carrying out such tests.

1.30 'Drawings'. 'Plans' shall mean all:

a) Drawings furnished by the owner/consultant as a basis for bid/ proposals.

b) Supplementary drawings furnished by the owner/consultant to clarify and to define in greater detail the intent of the contract.

c) Drawings submitted by the contractor with his bid provided such drawings are acceptable to the owner/ consultant.

d) Drawings furnished by the owner/consultant to the contractor during the progress of the work and

e) Engineering data and drawings submitted by the contractor during the progress of the work provided such drawings are acceptable to the Engineer/ owner.

1.31 ‘Codes’ shall mean the following, including the latest amendments, and/or replacements if any:

a) Indian Electricity Act.2003, and Rules and Regulations made thereunder.
b) Indian Factory Act.1948, and rules and regulations made thereunder.
c) Indian Explosive Act.1884, and rules and regulations made thereunder.
d) Indian Petroleum Act,1934, and rules and regulations made thereunder.
e) A.S.M.E.Test codes.
f) A.I.E.E.Test codes.

g) American Society of Materials Testing codes.
h) Standards of the Indian Standards Institution.
i) Other Internationally approved standards and or rules and regulations touching the subject- matter of the contract.

1.32 Words imparting the singular only shall also include the plural and vice-versa where the context so requires.

1.33 Words imparting 'person' shall include firms, companies, corporation and associations or bodies of individuals, whether incorporated or not.

1.34 Terms and expressions not herein defined shall have the same meanings as are assigned to them in the Indian Sales of Goods Act(1930), falling that in the Indian Contract Act(1872) and falling that in the General clauses Act (1897) including amendments thereof if any.

1.35 In addition to the above the following definitions shall also apply.

a) 'All equipment and materials' to be supplied shall also mean 'Goods'
b) 'Constructed' shall also mean 'erected and installed'
c) 'Contract Performance Guarantee' shall also mean 'Contract Performance Security'.

2.0 APPLICATION

These General conditions shall apply to the extent that they are not superseded by provisions in other parts of the contract.

3.0 STANDARDS

The goods supplied under this Contract shall conform to the standards mentioned in the Technical Specification, and, when no applicable standard is mentioned, to the authoritative standard appropriate to the good and such standards shall be the latest issued by the concerned institution.

4.0 LANGUAGE AND MEASURES

All documents pertaining to the contract including specification, schedules, notices, correspondence, operating and maintenance instructions, drawings or any other writing shall be written in English language. The Metric system of measurement shall be used exclusively in the contract.

5.0 CONTRACT DOCUMENTS

5.1 Notwithstanding anything stated elsewhere in the bid documents, the contract to be entered into will be treated as a supply and erection contract. The supply portion of the contract will relate to the supply of equipment and materials and the erection portion will relate to the handling at the site, storage, erection, construction, testing, commissioning of metering system as defined in the bid documents. The owner will pay the sales tax for the supply of equipment and materials in accordance with law as mentioned in the specification. The sales tax should be included in the bid price in the proposal and indicated separately.

5.2 The contract shall in all respects be construed and governed according to Indian laws.

6.0 JURISDICTION OF CONTRACT

6.1 The term contract documents shall mean and include the following which shall be deemed to form an integral part of the contract.

a) Invitation of Bid including letter forwarding the bidding documents, instructions to bidders, general terms and conditions of contract and all other documents included in Volume I.

b) Contract agreement duly executed in proforma at Annexure-III, Vol.I.

c) Specifications of the equipment to be furnished and erected under the contract and specification of erection testing commissioning as brought out in the accompanying Technical specifications (Vol.II).

d) Contractor's bid proposal and the documents attached thereto including the letters of clarifications thereto between the contractor and the owner/consultant prior to the Award of Contract except to the extent of repugnancy.

e) All the materials, literature, data and information of any sort given by the contractor along with his bid, subject to the approval of the owner/ consultant.

f) Letter of Award, detailed POs, work orders and any agreed variations of the conditions of the documents and special terms and conditions of contract, if any.

6.2 In the event of any conflict between the above mentioned documents, the matter shall be referred to the Managing Director, RSDCL whose decision shall be considered as final and binding upon the parties.

7.0 USE OF CONTRACT DOCUMENTS AND INFORMATION

7.1 The contractor shall not, without the Owner's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the owner in connection therewith, to any person other than a person employed by the contractor in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

7.2 The contractor shall not, without the owner's prior written consent, make use of any document or information enumerated in various contract documents except for purpose of performing the contract.

7.3 The contractor shall not communicate or use in advertising, publicity, sales releases or in any other medium, photographs or other reproduction of the Works under this contract, or descriptions of the site, dimensions, quantity, quality or other information, concerning the works unless prior written permission has been obtained from the owner.

7.4 Any document, other than the contract itself, enumerated in various contract documents shall remain the property of the owner and shall be returned (in all copies) to the owner on completion of the contractor's performance under the contract if so required by the owner.

8.0 CONSTRUCTION OF THE CONTRACT

8.1 The laws applicable to the Contract shall be the laws in force in India. The courts of JAIPUR shall have exclusive jurisdiction in all matters arising under this contract.

9.0 ENFORCEMENT OF TERM

10.1 The failure of either party to enforce at any time any of the provisions of this contract or any rights in respect thereto or to exercise any option therein provided shall in no way be construed to be a waiver of such provisions, rights or options or in any way to affect the validity of the contract. The exercise by either party of any of its rights herein shall not preclude or prejudice either party from exercising the same or any other right it may have under the contract.

11.0 COMPLETION OF CONTRACT

11.1 Unless otherwise terminated under the provisions of any other relevant clause, this contract shall be deemed to have been completed on the expiry of the guarantee period as provided for under the clause entitled 'Guarantee' in this section of the Volume-I.

B. GUARANTEES AND LIABILITIES

12.0 TIME -THE ESSENCE OF CONTRACT

12.1 The time and the date of completion of the contract as stipulated in the contract by the owner without or with modifications, if any, and so incorporated in the letter of Award, shall be deemed to be the essence of the Contract. The contractor shall so organize his resources and perform his work as to complete it not later than the date agreed to.

13.0 EFFECTIVENESS OF CONTRACT

The contract shall be considered as having come into force from the date of the Notification of Award unless otherwise provided in the Notification of Award.

14. DELAY IN DELIVERY / COMPLETION

14.1 The time and the date of delivery/ completion period specified in the purchase/work order shall be deemed to be the essence of the contract and the work of metering system shall have to be completed not later than the period specified in the specification or any extension thereof. Should the contractor fail to complete the work (testing and commissioning/taking over of the metering system on order or any part thereof within the specified completion period, the contractor shall pay recovery to the owner towards delay in completion of metering system, a sum equivalent to half percent (0.5%) of the contract price (material and erection/ installation, testing & commissioning) as a recovery for such default, for each week or part thereof of delay, until actual completion upto a maximum recovery of 10% of the total contract price (material and erection, testing & commissioning). The payment or deduction of such recovery shall not relieve the contractor from its obligation to complete the works or any other obligations and liabilities under the contract.

14.2 Any financial liability arising from and consequent upon the failure of the contractor to adhere to the stipulated completion schedule shall be to the contractor's account.
Note: Contract price shall mean *"Ex-works price of material/ equipments* including freight, insurance, taxes & duties *and total cost of erection/ installation, testing & commissioning"*.

14.3 Equipment and materials will be deemed to have been delivered only when all its components, parts are also delivered. If certain components are not delivered in time, the equipment and materials will be considered as delayed until such time the missing parts are also delivered.

14.4 The recovery for not meeting the performance guarantees during the performance and guarantee test shall be assessed and recovered from the contractor as detailed in specification. Such recoveries shall be without any limitation whatsoever and shall be in addition to recoveries if any payable under any other clause of conditions of contract.

14.5 The recovery for delay in completion of works shall be applicable for complete contracts (Supply of material and equipments and erection testing & commissioning) and all these recoveries will run concurrently.

14.6 COMPANY may without prejudice to any other method of recovery, deduct the amount of such recovery from any of dues or to become due to the Contractor including final 10% payment (retention money).

15 GUARANTEE:

15.1 The contractor shall guarantee that all the equipments will be new, unused and in accordance with the contract documents and free from defects in material and workmanship for a period of twelve (12) calendar months commencing immediately upon the handing over of complete metering system to RSDCL by the contractor, after satisfactory commissioning of all equipments, completion of metering system. However, the guarantee period of ABT meters shall be 5 years from its satisfactory commissioning in the system or five & half years from its supply at site, whichever is earlier.

The contractor's liability shall be limited to the replacement of any defective parts in the equipment of his own manufacture or those of his sub-contractors, under normal use and arising solely from faulty design, materials and/or workmanship provided always that such defective parts are repairable at the site and are not in meantime essential in the commercial use of the equipment. Such replaced/defective parts shall be returned to the Contractor unless otherwise arranged. No repairs or replacement shall normally be carried out by the Engineer when the equipment is under the supervision of the Contractor's supervisory Engineer.

15.2 In the event of any emergency where in the judgment of the Engineer, delay would cause serious loss to RSDCL or damages to the owner’s equipments/works, repairs or adjustments may be made by the RSDCL Engineer or a third party chosen by the Engineer without advance notice to the contractor and the cost of such work shall be paid by the contractor to the owner. In the event such action is taken by the Engineer, the contractor will be notified promptly and he shall assist wherever possible in making necessary corrections. This shall not relieve the contractor of his liabilities under the terms and conditions of the contract.

15.3 If it becomes necessary for the contractor to replace or renew any defective portions of the equipments/works, the provision of this clause shall apply to portion of the works/ items so replaced or renewed until the expiry of twelve (12) months from the date of such replacement or renewal for all equipments/items. If any defects are not remedied within a reasonable time, the Engineer may proceed to do the work at the contractor's risk and cost, but without prejudice to any other rights which the owner may have against the contractor in respect of such defects.

15.4 The repaired or new parts will be furnished and erected free of cost by the contractor. If any repair is carried out on his behalf at the site, the contractor shall bear the cost of such repairs.

15.5 The cost of any special or general overhaul rendered necessary during the maintenance period due to defects in the equipment or defective works carried out by the contractor, the same shall be borne by the contractor.

15.6 The acceptance of the equipment by the Engineer shall in no way relieve the contractor of his obligations under this clause.

15.7 In the case of those defective parts which are not repairable at site but are essential for the commercial operation of the equipment, the contractor and the Engineer In-charge of RSDCL shall mutually agree to a programme of replacement or renewal which will minimise interruption to the maximum extent, in the operation of the equipment.

15.8 At the end of the Guarantee Period, the contractor's liability ceases except for latent defects. For latent defects, the contractor's liability as mentioned in clause No.14.1 through 14.7 above, shall remain till the end of 5 years from the date of completion of Guarantee period. In respect of goods supplied by sub-contactors to the contractor where a longer guarantee (more than 12 months) is provided by such sub-contractor, the owner shall be entitled to get benefit of such longer guarantee.

16.0 TAXES, PERMITS AND LICENCES

The Contractor shall be liable and pay all non-Indian & Indian taxes, duties, levies, lawfully assessed against the Owner or the Contractor in pursuance of the Contract. In addition the Contractor shall be responsible for payment of all Indian duties, levies and taxes lawfully assessed against the contractor for his personal income and property.

17. REPLACEMENMT OF DEFECTIVE PARTS AND MATERIALS

17.1 If during the performance of the Contract, the Engineer shall decide and inform in writing to the contractor that the contractor has manufactured any equipment, material or part of equipment unsound and imperfect or has furnished any equipment inferior to the quality specified, the Contractor on receiving details of such defects or deficiencies shall at his own expense make it good, proceed to alter, reconstruct or remove such works and furnish fresh equipment/materials upto the standards of the specifications within 15 days of receipt of notice from RSDCL. In case the contractor fails to do so within 15 days of receipt of notice, the Engineer may on giving the contractor seven (7) days notice in writing of his intentions to do so, proceed to remove the portion of the Works so complained and at the cost of the contractor perform all such work or furnish all such equipment/material provided that nothing in this clause shall be deemed to deprive the owner or affect any rights under the contract which the owner may otherwise have in respect of such defects and deficiencies.

17.2 The contractor's full and extreme liability under this clause shall be satisfied by the payment to the owner of the extra cost, of such replacement procured including erection as provided for in the Contract, such extra cost being the ascertained difference between the price paid by the owner for such replacements and the contract price by portion for such defective equipment/materials/works and repayments of any sum paid by the owner to the contractor in respect of such defective equipment/material. Should the owner not so replace the defective equipment/materials the contractor's extreme liability under this clause shall be limited to

repayment of all sums paid by the owner under the contract for such defective equipment/materials.

18.0 DEFENCE OF SUITS

If any action in Court is brought against the owner or Engineer or an officer or agent of the owner, for the failure, omission or neglect on the part of the Contractor to perform any acts , matters, covenants or things under the contract , or for damage or injury caused by the alleged omission or negligence on the part of the contractor, his agents, representatives or his Sub-Contractors, or in connection with any claim based on lawful demands of sub-contractors, workman, suppliers or employees, the contractor shall in all such cases indemnify and keep the owner, and the Engineer and/or his representative, harmless from all losses, damages, expenses or decrees arising of such action.

19.0 LIMITATION OF LIABILITIES

The final payment by the owner in pursuance of the contract shall mean the release of the Contractor from all his liabilities under the contract. Such final payment shall be made only at the end of the Guarantee/Warranty period, and till such time as the contractual liabilities and responsibilities of the contractor, shall prevail. All other payments made under the contract shall be treated as on-account payments.

20.0 ENGINEER'S DECISION

20.1 In respect of all matters which are left to the decision of the Engineer including the granting or with loading of the certificates , the Engineer shall, if required to do so by the Contractor, give in writing a decision thereon.

20.2 If, in the opinion of the contractor, a decision made by the Engineer is not in accordance with the meaning and intent of the Contract the Contractor may file with the Engineer, within fifteen (15) days after receipt of the decision, a written objection to the decision . Failure to file an objection within the allotted time will be considered as an acceptance of the Engineer's decision and decision shall become final and binding.

20.3 The Engineer's decision and the filing of the written objection thereto shall be a condition precedent to the right to request to the settlement committee (Shall be formed by RSDCL). It is the intent of the Agreement that there shall be no delay in the execution of the works and the decision of the Engineer as rendered shall be promptly observed.

21.0 POWER TO VARY OR OMIT WORK

21.1 No alterations, amendments, omissions, suspensions or variations of the works (hereinafter referred to as 'variation') under the contract as detailed in the contract documents, shall be made by the contractor except as directed in writing by the Engineer, but the Engineer shall have full powers subject to the provisions hereinafter contained, from time to time during the execution of the contract, by notice in writing to instruct the contractor to make such variation without prejudice to the contract . The contractor shall carry out such variation and be bound by the same conditions as far as applicable as though, the said variations occurred in the contract documents. If any suggested variations would, in the opinion of the contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the contract, he shall notify the Engineer thereof in writing and the Engineer shall decide forthwith whether or not, the same

shall be carried out and if the Engineer confirms his instructions, the contractor's obligations and guarantees shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such variation shall be added to or deduced from the contract price as the case may be.

21.2 In the event of Engineer requiring any variation, a reasonable and proper notice shall be given to the contractor to enable him to work his arrangement accordingly, and in cases where goods or materials are already prepared or any design, drawings or pattern made or work done requires to be altered, a reasonable and agreed sum in respect thereof shall be paid to the contractor.

21.3 In any case in which the contractor has received instructions from the Engineer as to the requirement of carrying out the alterations or additional or substituted work which either then or later on, will in the opinion of the contractor, involve a claim for additional payment, the contractor shall immediately and in no case later than thirty (30) days, after receipt of the instructions aforesaid and before carrying out the instructions, advise the Engineer to that effect. But the Engineer shall not become liable for the payment of any charges in respect of any such variations, unless the instructions for the performance of the same shall be confirmed in writing by the Engineer.

Extra/Additional works, if any shall be carried out by the bidders as per provisions of technical specification.

21.4 If any variation in the works results in reduction of contract price, the parties shall agree, in writing, so to the extent of any change in the price, before the contractor proceeds with the change.

21.5 In all the above cases, in the event of a disagreement as to the reasonableness of the said sum, the decision of the Engineer shall prevail.

21.6 Notwithstanding anything stated above in this clause, the Engineer shall have the full power to instruct the contractor , in writing during the execution of the contract to vary the quantities of the items or groups of items in accordance with the provisions of clause entitled 'Change of quantity' in section GCC of this Volume-I. The Contractor shall carry out such variations and be bound by the same conditions as though the said variations occurred in the contract documents. However , the contract price shall be adjusted at the rates and the prices provided for the original quantities in the Contract.

22.0 ASSIGNMENT AND SUB-LETTING OF CONTRACT

The contractor may, after informing the owner and getting his written approval, assign or sublet the contract for erection work and / or civil work of metering system or any part thereof. The experience list of such sub contractors for erection / installation works under consideration by the contractor for this contract shall be furnished to the owner for approval within 15 days from the date of issue of detail award prior to commencement of erection / civil work. Such assignment/sub-letting shall not relieve the contractor of any obligation, duty or responsibility under the contract. Any assignment as above, without prior written approval of Engineer, shall be void.

23.0 CHANGE OF QUANTITY :

23.1 During the execution of the contract, the owner reserves the right to increase or decrease the quantities of items under contract but without any change in unit price or other terms and

conditions. Such variations unless otherwise specified in the accompanying specifications, shall not be subjected to any limitations for the individual items.

23.2 The contract price shall accordingly be adjusted based on the unit rates available in the contract for the change in quantities as above. The unit rates, as identified in the contract shall however remain constant during the currency of the contract. In case the unit rate are not available for the change in quantity, the same shall be subject to mutual agreement.

i) Application for payment alongwith two copies (original plus one copy) of invoice, with receipted challan, inspection/despatch clearance certificate, packing list, insurance certificate & other despatch documents to the Director (Tech), RSDCL, Jaipur.

ii) Copy of application form for payment alongwith copy of invoice, packing list, despatch document i.e. LR, despatch clearance, test certificate to the site Engineer Incharge.

iii) Copy of application form for payment alongwith copy of invoice, receipted challan, despatch clearance, insurance certificate, packing list & copy of other despatch documents to the Director (Tech.), RSDCL, Jaipur.

24.0 PACKING, FORWARDING AND SHIPMENT

24.1 (i) Unless otherwise mutually agreed upon, the material/equipment on order shall be required to be dispatched by road transport on 'Freight Paid' basis.

(ii) The purchaser, however, reserves the right to agree to any alternative mode of transport.

(iii) The entire responsibility for freight of goods/material right from the manufacturer's premises/purchaser's store house to work site shall be of the Contractor and he shall make and complete all necessary formalities as well as arrangements for the same.

24.2 The contractor shall notify the owner of the date of each shipment from his works, and the expected date of arrival at the site for the information of the owner.

24.3 The contractor shall also give all shipping information concerning the weight, size and content of each packing including any other information the owner may require.

24.4 The following documents shall be sent by registered post to the owner within 7 days from the date of shipment, to enable the owner to make progressive payments to the contractor:

24.5 The contractor shall prepare detailed packing list of all packages and containers bundles and loose material forming each and every consignment despatched to site . The contractor shall further be responsible for making all necessary arrangements for loading, unloading and other handling right from his works upto the site and also till the equipment is erected, tested and commissioned. He shall be solely responsible for proper storage and safe custody of all equipment.

24.6 The entire responsibilities for freight of goods/material right from the manufacturer's premises/Purchaser's store house to work site shall be of the contractor and he shall make and complete all necessary formalities as well as arrangements for the same as this is total turnkey contract.

25.0 COOPERATION WITH OTHER CONTRACTORS AND CONSULTING ENGINEERS:

The contractor shall agree to cooperate with the owner's other contractors and consulting Engineers and freely exchange with them such technical information as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of efforts. The Engineer shall be provided with three copies of all correspondence addressed by the contractor to other contractors and consulting engineers of the owner in respect of such exchange of technical information.

26.0 **NO WAIVER OF RIGHTS**

Neither the inspection by the owner or the Engineer or any of their officials, employees, or agents nor any order by the owner or the Engineer for payment of money or any payment for or acceptance of, the whole or any part of the works by the owner or the Engineer, nor any extension of time, nor any possession taken by the Engineer shall operate as a waiver of any provision of the contract, or of any power herein reserved to the owner or any right to damages herein provided nor shall any waiver of any breach in the contract be held to be a waiver of any other or subsequent breach.

27.0 **CERTIFICATE NOT TO AFFECT RIGHT OF OWNER AND LIABILITY OF CONTRACTOR**

No interim payment certificate of the Engineer, nor any sum paid on account by the owner, nor any extension of time for execution of the works granted by the engineer shall affect or prejudice the rights of the owner against the contractor or relieve the contractor of his obligation for the due performance of the contract, or be interpreted as approval of the works done or of the equipment furnished and no certificate shall create liability for the owner to pay for alterations, amendments, variations or additional works not ordered, in writing, by the Engineer or discharge the liability of the contractor for the payment of damages whether due, ascertained, or certified or not or any sum against the payment of which he is bound to indemnify the owner, nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect or prejudice the rights of owner against the contractor.

28.0 **TRAINING OF OWNER'S PERSONNEL: If desired by owner/ purchaser.**

28.1 The contractor shall undertake to train free of cost, engineering personnel selected and sent by the owner at the works of the contractor unless otherwise specified in the Technical Specifications. The period and the nature of training for the individual personnel shall be agreed upon mutually between the contractor and the owner. These engineering personnel shall be given special training in the shops, where the equipment will be manufactured and/or in their collaborator's works and where possible, in any other plant where equipment manufactured by the contractor or his collaborator is under installation, operation, or testing to enable those personnel to become familiar with the equipment being furnished by the contractor. The details of the Nos. of persons to be trained, period of training, nature of training etc. shall be as mutually agreed.

28.2 All travelling and living expenses for the engineering personnel to be trained during the total period of training will be borne by the owner. These engineering personnel, while undergoing training, shall be responsible to the contractor for discipline.

28.3 The owner shall not be entitled for any rebate whatsoever on any account in the event of his failing to avail of the training facilities, for any reason.

29.0 TAKING OVER

Upon successful completion of all the tests to be performed at site on equipments supplied and erected/ installed by the contractor and on completion of all the works of the metering system as per the specification, the engineer shall issue to the contractor a taking over certificate as a proof of the final acceptance of the equipment. Such certificate shall not unreasonably be withheld nor will the engineer delay the issuance thereof on account of minor omissions or defect which do not affect the commercial operation and / or cause any serious risk to the equipment/ works. Such certificate shall not relieve the contractor of any of his obligations which otherwise survive, by the terms and conditions of the contract after issue of such certificate. The taking over certificate shall be issued by concerned Engineer and shall be counter signed by Director (Tech) RSDCL.

CONTRACT SECURITY AND PAYMENTS

30.0 CONTRACT PERFORMANCE GUARANTEE

The contractor shall furnish contract performance guarantee (s) for the proper fulfilment of the contract in the prescribed form within fifteen (15) days **"**from the date of issue of order(s)**"**. The performance guarantee (s) shall be as per terms prescribed in section ITB, Conditions of Contract Vol.I.

31.0 CONTRACT PRICE & ESCALATION/VARIATION

No price escalation shall be allowed as the bidders have to quote "FIRM" prices independent of any variation for all the items/ works.

32.0 PAYMENT

32.1 The payment to the contractor for the performance of the works under the contract will be made by the owner as per the guidelines and conditions specified herein. All payment made during the contract shall be on account payments only. The final payment will be made on completion of all works and on fulfilment by the contractor of all his liabilities under the contract.

32.2 Due dates for payment

Owner will make progressive payment as and when the payment is due as per the terms of payment. Progressive payments shall be payable by the owner within a reasonable period from the date of receipt of contractor's bill/invoice/debit note by the owner, provided the documents submitted are complete in all respects and contractor have fulfilled all contractual formalities. The purchaser will take all possible efforts to make payment to the contractor within thirty days. But in case of delay in payment, the purchaser shall not be liable to pay any interest on the outstanding amount to the contractor.

32.3 Mode of payment

Payment shall be made to supplier/contractor through RTGS/NEFT for quick and safe transfer of funds across the country (both local and outstation). The charges for transfer through RTGS/NEFT shall be on the part of supplier/ contractor. The supplier/contractor shall furnish

particulars to the payment making authorities of RSDCL in prescribed format to be provided by the purchaser.

FOR SUPPLY OF MATERIAL AND ERECTION/ TESTING/ COMMISSIONING:-

32.3.1 Payment due on despatch of equipment shall be made by the owner through owner's bank or directly to the contractor as per the payment schedule.

32.3.2 a) The Payment shall be made by Paying authority within a reasonable period from the date of receipt of the Contractor's bills/invoices from the consignee duly verified and submission of other documents by the contractor to him complete in all respect and supported by the requisite documents, if any duly verified and completion of all contractual formalities as per requirement of the purchase order. All the payment shall be released to the Contractor directly. The purchaser will take all possible efforts to make payment to the contractor within thirty days. But in case of delay in payment, the purchaser shall not be liable to pay any interest on the outstanding amount to the contractor.

b) The contractor shall forward invoices as well as challans to the consignee in Four (4) copies (including original challan) mentioning copy No. on each invoice and challan.

c) The consignee/ site engineer will verify all the copies of challans in token of acceptance of the material in good condition and as per specification given in the purchase order in the prescribed format. The consignee/ site engineer will retain one copy of receipted challan alongwith copy of invoice for reference and further accounting at his end. One copy of receipted challans will be endorsed Director (Tech). Remaining two (2) copies of receipted challans and invoice (including original challans) will be forwarded by the Director (Fin) RSDCL, Jaipur.

d) No documents are to be routed through Bank. Documents other than invoices and challans will be sent by the contractor directly to the Paying authority, a copy to purchaser.

e) The GTR shall be drawn in favour of the consignee/ site Engineer and shall be despatched immediately.

33.0 **Terms of payment**

33.1 The payments for the material/equipment/erection work shall be made as under only after execution of the contract agreement and furnishing of security bank guarantee of 2% of total contract value (valid upto 90 days from the date of handing over of the complete metering system after commissioning), Performance Bank guarantee of 10% of total contract value (valid upto one year from the date of handing over of the complete metering system after commissioning) as per the following relevant clauses.

33.2 The payment terms for various components of Supply and Services shall be as under:

(A) Ex-Works Price Component for Main Equipments:

a) Payment equal to 70% (Seventy percent) of ex-works value of the material / equipment shall be made to the contractor on receipt of material / equipment at site on the basis of certificate issued by engineer in-charge that this much quantity has been brought by contractor at site. However, before despatch of material / equipment at site, contractor shall be required to get it inspected and cleared from RSDCL. Material at site will remain in the

custody of the contractor and he shall be liable for theft, damage or deterioration if any. It will be the responsibility of the contractor to get the material / equipment at site duly insured at his cost.

b) Further 20% (Twenty percent) payment of ex-works value of the material / equipment will be paid after submission of verification / certification by RSDCL's engineer that equipment / material has been erected/ installed.

c) Final 10% (ten percent) payment of ex-works price of equipment/material shall be made after submission of taking over certificate after adjustment of due recoveries/ damages, if any and proof of submission of required number of reproducible, O&M manuals, approved drawings, data sheets, test reports, pamphlets and manuals of spares, maintenance and testing equipment of the metering system, if any.

(d) The payment of the bills, upto the order value will be released without limiting to the individual item quantity.

34.0 TAXES AND DUTIES:

In case of direct transactions between the owner and the contractor, taxes and duties, shall be paid at actuals as applicable during contractual delivery period or actual delivery period, which will be lower, against submission of invoices and documentary evidence. In case of bought items, taxes and duties shall be included by the bidder in the quoted Ex-work prices. In respect of bought-out finished items, which shall be despatched directly from the sub-vendor's works to the Company's site (sale-in-transit), the ex-works price is inclusive of all cost as well as duties and taxes (viz., custom duties & levies, duties, sales tax/VAT etc.) paid or payable and any such taxes, duties, levies additionally payable.

(B) Erection/ installation & commissioning works Price Component:

(a) Payment equal to Ninety percent (90%) of the total Erection/ installation & commissioning@ works price component shall be paid after successful erection/ installation and commissioning of all the equipments/ items at all the sites/ locations and certification by the RSDCL's Engineer that the complete scheme has become operational & providing/ transmitting the required data at all the designated locations and also Bills are being generated as per specification.

@ "Commissioning" for the purpose of payments shall mean satisfactory completion of all supplies, erection/ installation, inspection, commissioning checks and successful completion of all site tests and continuous energisation of the equipment/ materials at site as per the Contract and to the satisfaction/ approval of Company.

b) Final 10% (ten percent) payment of Erection/ installation & commissioning of equipment/material shall be made after submission of taking over certificate after adjustment of due recoveries/ damages, if any and proof of submission of required number of reproducible, O&M manuals, approved drawings, data sheets, test reports, pamphlets and manuals of spares, maintenance and testing equipment of the metering system, if any.

35.0 PRICES

35.1 In respect of prices (Firm only), following may be noted:

i) No separate price shall be allowed for transportation of material to work spot. These shall be absorbed in the rates given in price schedules for each type of erection work involved.

ii) No separate price shall be allowed for the tools and plants etc. required in the erection/ installation work. These shall be arranged by the contractor at his own cost.

iii) Quantities indicated in the price schedules are tentative/ provisional.

iv) All wastages, damages, losses etc. in any materials and equipment while supply, transportation up to site, handling, erection/ installation, testing and commissioning etc. will be to the Contractor's account and no payment is admissible for the same. If payment is made for the same during supply etc., then the same will be adjusted from the Contractor's balance payment.

v) The unit rates quoted shall include minor items/details which are obviously and fairly intended, and which may not have been included in these documents but are essential for the satisfactory completion of the various works.

vi) The unit rate quoted shall also be inclusive of deployment of all plant equipment, men, material, skilled and unskilled labour etc. essential for satisfactory completion of various works.

vii) Payment towards contract price shall be made in Indian Currency.

35.2 For the items of which unit rates are given but their cost not included in the contract price, the payment shall be made at the unit rates indicated in the price schedules as per quantities finally approved by the purchaser.

35.3 If any income-tax, surcharge on income tax or any other corporate tax is attracted under the law then the same shall be paid by him as per Government rules /deducted from his bills/invoices at the prevailing rate and if such tax is not applicable, then the contractor can claim reimbursement of the same from the relevant competent authority. However, necessary TDS certificate(s) shall be issued by RSDCL's Paying Authority.

35.4 The scope of supplies under this contract shall also include all such items which are not specifically mentioned in the Bidding documents and/or in the bid of the bidder but are necessary for the successful erection, testing and commissioning of metering system, without any extra cost to the purchaser, unless otherwise specifically excluded in the bidding documents.

36.0 TYPE TESTS:

a) In the event of order, valid type test reports of the equipments under supply shall be furnished as per requirement of specification by the bidder from a Govt./a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accredation Co-operation (in case of foreign laboratories) or the certificate of type test conducted at manufacturer's works duly witnessed by representative of any Electricity Board/ Company/ Govt. agency/ PGCIL/ NTPC (wherever specified in technical specification for particular items) or the certificate of type test conducted in the manufacturer's own lab located in the foreign country duly witnessed by independent agency as per relevant standards**.** The type test

certificates should not be older than 7 years as on the date of bid opening**.** However, no separate type test charges shall be paid to the bidders.

b) In case of any specific alternative requirement of type tests, the same shall also be furnished.
c) The supplier shall be required to furnish the routine/manufacturer(s) factory test certificate (s) for the tests carried out during manufacture in accordance with the relevant standard specifications.

37.0 FINAL ACCOUNT:

i) Within 3 (three) months after the date of completion of works, the Contractor shall submit a draft statement of final account and supporting document to the Engineer/Engineer's representative showing therein the details, the value of the works done in accordance with the contract, together with all further sums which the contract upto the date of the maintenance certificate (hereinafter called the "Contractor's Draft Final Account").

ii) Within 3 (three) months after receipt of the Contractor's Draft Final Account and of all information reasonably required for its verification, the Engineer/Engineer's representative shall determine the value of all matters to which the Contractor is entitled to under the contract. The Engineer/Engineer's representative shall then issue to the Contractor a statement showing the final amount, to which the Contractor is entitled to, under the contract. The Contractor shall sign the Engineer's statement of Final Account as an acknowledgement of the full and final value of the work performed under the contract and shall promptly submit a signed copy of the same to the Engineer/Engineer's representative.

h) FINAL CERTIFICATE:

i) On receipt of the final Account, the Engineer/Engineer's representative shall promptly prepare and issue to the Director (Tech), RSDCL, Jaipur and the Contractor a Final payment certificate, certifying any further amount due to the Contractor in respect of the contract.

ii) After issue of the certificate(s) by the engineer, the Contractor shall claim as per procedure given above.

38.0 **INSURANCE**

38.1 The contractor at his cost shall arranged, secure and maintain all insurance as may be pertinent to the works and obligatory in terms of law to protect his interest and interests of the owner against all perils detailed herein. The form and the limit of such insurance as defined herein together with the under-writer in each case shall be acceptable to the owner. However, irrespective of such acceptance, the responsibility to maintain adequate insurance coverage at all time during the period of contract shall be of contractor alone. The contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations. The insurance covers to be taken by the contractor shall be in a **joint name** of the owner and the contractor. The contractor shall, however, be authorised to deal directly with insurance company or companies and shall be responsible in regard to maintenance of all insurance covers. Further, the insurance should be in freely convertible currency.

38.2 Any loss or damage to the equipment during handling, transportation, storage, erection, putting into satisfactory operation and all activities to be performed till the successful completion of commissioning of the equipment shall be to the account of the contractor. The contractor shall

be responsible for preference of all claims and make good the damages or loss by way of repairs and/or replacement of the equipment, damages or lost. The transfer to title shall not in any way relieve the contractor of the above responsibilities during the period of contract. The contractor shall provide the owner with copy of all insurance policies and documents taken out by him in pursuance of the contract. Such copies of documents shall be submitted to the owner immediately after such insurance coverage. The contractor shall also inform the owner in writing at least sixty (60) days in advance regarding the expiry/cancellation and/or change in any of such documents and ensure revalidation, renewal etc. as may be necessary well in time.

38.3 All costs on account of insurance liabilities covered under the contract will be on contractor's account and will be included in contractor price. However, the owner may from time to time, during the pendency of the contract , ask the contractor in writing to limit the insurance coverage, risks and in such a case, the parties to the contract will agree for a mutual settlement, for reduction in contract price to the extent of reduced premia amount. The contractor, while arranging the insurance shall ensure to obtain all discounts on premia which may be available for higher volume or for reason of financing arrangement of the project.

38.4 The clause entitled 'insurance' under this section, covers the additional insurance requirements for the portion of the works to be performed at the site.

a) On receipt of an order, the supplier shall be required to get the material/equipment on order fully insured from the General Insurance Corporation of India or any other Nationalized Insurance Company against any loss, damage, and/or pilferage in transit from the place of despatch to the destination station(s) and for further period of 60 days after receipt of material/equipment at destination.

b) The supplier shall be responsible for safe arrival at destination and receipt of material/equipment by the consignee(s).

c) In case of any loss/damage/pilferage etc. the supplier shall replace free of cost such missing/damaged or lost material on receipt of the report thereof from the consignee(s). Such reports shall be made to the supplier by the consignee(s) within a period of 30 days from the date of receipt of each consignment by him/them.

d) The replacement of shortages/damages/losses shall be made or defects rectified at the consignees store(s) within a period of 60 days from the date of such reports, failing which the purchaser reserves the right to forfeit the security deposit and/or operate the performance bank guarantee, if any and/ or take any other appropriate action as may be expedient.

e) The defective damaged material/equipment shall be returned to the supplier at his cost only after replacement thereof has been made to the satisfaction of the consignee(s)/purchaser.

f) In case the damaged/defective material/equipment or a part thereof warrants return at the supplier's work for necessary rectification, the Contractor shall be required to furnish a Bank guarantee from any Scheduled / Nationalized bank equivalent to the value of such materials plus taxes as claimed by the supplier. The period for return of rectified material/ equipment as well as validity of the Bank guarantee shall be as mutually agreed upon, without affecting the date of contractual completion period (including approved extension thereof, if any).

39.0 SUSPENSION OF WORK

a) The Contractor shall on the written order of the Engineer, suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work, so far it is necessary in the opinion of the Engineer. The extra cost incurred by the Contractor in giving effect to the Engineer's instructions under this clause shall be borne and paid by the owner, unless such suspension is:

i) otherwise not provided for in the contract.
ii) necessary by reason of some default on the part of the Contractor or.
iii) necessary by reason of climatic conditions on the site or.
iv) necessary for the proper execution of the works or for the safety of works or any part thereof in so far as such necessity does not arise from any act or default by the Engineer/Engineer's representative or from any of the expected risks defined in clause No. 38 of GCC.

b) Provided that the Contractor shall not be entitled to recover any such extra cost unless he gives written notice of his intention to claim to the Engineer within thirty days of the Engineer's order. The Engineer shall settle and determine such extra payment and/or extension of time under clause No. 59.4 below to be made to the Contractor in respect of such claim as shall in the opinion of the Engineer be fair and reasonable.

40.0 **CONTRACTOR'S DEFAULT**

40.1 a) If the Contractor shall neglect to execute the work with due diligence and expedition or shall refuse or neglect to comply with any reasonable orders given to him in writing by the engineer in connection with the work or shall contravene the provisions of contract the purchaser may give notice in writing to the Contractor calling upon him to make good the failure, or neglect contravention complained of.

b) Should the Contractor fail to comply with such notice within a period considered reasonable by the purchaser from the time of service thereof, in the case of being made good within the time, or otherwise within such time as may in the opinion of the purchaser be reasonably necessary for making it good, then and in such case the purchaser shall have the option and be at liberty to take the work wholly or in part out of Contractor’s hands and may carry on the work necessary to complete the work envisaged in the contract, either by himself or through his agents or may re-contract at reasonable price with any other person or persons to execute the same or any part thereof and provide any other materials, tools, tackles or labour for the purpose of completing the works or any part thereof. In such event the purchaser shall have free use of all Contractor’s materials, tackles or other things that may have been at the time on the site in connection with the work without being responsible to the Contractor, for fair wear and tear of the same be entitled to seize and take precession and to the exclusion of any right of the Contractor over the same and the purchaser shall be entitled to retain and apply and balance sum which may otherwise be then due on the contact by him to the Contractor or such part thereof as may be necessary, to the payment of the cost of execution of such work aforesaid or of completing of works as the case may be.

c) If the cost of executing the work as aforesaid shall exceed the balance due to the Contractor and Contractor fails to make good the defects the said materials tools, tackles, construction plant or other things, the property of the Contractor as may not have been used up in

the completion of works, may be sold by the purchaser and proceeds applied towards the payment of such difference and the cost of the incidental to such sale. Any outstanding balance existing after crediting the proceeds of such sale be paid by the Contractor on the certificate of the engineer but when all expenses costs and charges incurred by the purchaser in the completion of the work are paid by the Contractor, all such materials, tools, tackles, construction plant or other things not used up in the completion of the works and remaining unsold shall be removed by the Contractor. If the proceeds of the above sale of the Contractor's materials, tools, tackles, construction plant etc. are insufficient to cover the cost of executing the aforesaid work, the balance remaining, after crediting the proceeds of such sale shall be recoverable from the Contractor by the action of law, or operating bank guarantees furnished or security deposits available with the purchaser. Such payment of excess amount shall be independent of the recovery for which the Contractor shall have to pay on account of the completion of works is delayed.

40.2 In addition, such action by the owner as aforesaid shall not relieve the contractor of his liability to pay against recovery clause for delay in completion of works as defined in clause 14.0 of this section.

40.3 Such action by the owner as aforesaid the termination of the contract under this clause shall not entitle the contractor to reduce the value of the contract performance guarantee nor the time thereof. The contract performance guarantee shall be valid for the full value and for the full period of the contract including guarantee period.

41.0 TERMINATION OF CONTRACT ON OWNER'S INITIATIVE

41.1 The owner reserves the right to terminate the contract either in part or in full due to reasons other than those mentioned under clause entitled contractor's default. The owner shall in such an event give fifteen (15) days notice in writing to the contractor of his decision to do so.

41.2 The contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and contracts to the extent they are related to the work terminated and terms satisfactory to the owner, stop all further sub-contracting or purchasing activity related to the work terminated, and assist the owner in maintenance, protection and disposition of the works acquired under the contract by the owner.

41.3 In the event of such a termination, the contractor shall be paid compensation, equitable and reasonable, dictated by the circumstances prevalent at the time of termination.

41.4 If the contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the contractor is a partnership concern and one of the partners dies then unless the owners is satisfied that the legal representatives of the individual contractor or of the proprietor of the propriety concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the contract the owner shall be entitled to cancel the contract as to its uncompleted part without being in any way liable to payment of any compensation to the estate of deceased contractor and/or to the surviving partners of the contractor's firm on account of the cancellation of the contract. The decision of the owner that the legal representatives of the deceased contractor or surviving partners of the contractor's firm cannot carry out and complete the contract shall be final and binding on the parties. In the event of such cancellation, the owner shall not hold the estate of the deceased contractor and/or the surviving partners of the contractor's firm liable to damages for not completing the contract.

RESOLUTION OF DISPUTES

42.0 SETTLEMENT OF DISPUTES

(a) All disputes , differences, questions whatsoever so arising between the owner & the contractor upon or in relation to or in connection with contract shall be deemed to have arisen at Jaipur (Rajasthan) only and no courts other than courts in Jaipur shall have jurisdiction to entertain the same.

The RSDCL will constitute the centralized standing committee for settlement of disputed claims under condition of contract relating to RSDCL. The committee shall consider all cases for settlement of disputed claims relating to purchases, works, turnkey contracts and other contracts etc. The committee shall also take decision whether a particular matter is required to be referred to the Board for approval before settlement. The matter for settlement shall only be referred to the centralized standing committee of RSDCL by following the guide lines detailed below:-

(1) Disputes will be referred contract wise.
(2) Disputes involving amount above Rs.1.00 lacs only will be referred/ entertained.
(3) Non-refundable fee shall be deposited by the contractor / firm @ 2% of disputed amount as claimed by the contractor/firm subject to maximum fee of Rs.1.00 lac.
(4) In case of disputes, Application for settlement may be submitted incorporating all detail to the Director (Tech.) RSDCL, Jaipur.

The centralized standing committee fees shall be deposited in cash/demand draft /pay order with the Director (Tech), RSDCL, Jaipur and shall furnish receipt thereof with a request for referring their disputes to the centralized standing committee for decision.

For settlement, the firm shall furnish their application indicating the details of disputes / grievances along with requisite settlement fee within a period of six months after receiving communication from Director (Tech.) RSDCL, Jaipur giving rise to cause of disputes/ grievances.

43.0 INSPECTION AND TESTING

43.1 The engineer and his duly authorised representative shall have at all reasonable times access to the contractors premises of works and shall have the power at all reasonable time to inspect drawing of any portion of the work or examine the materials and workmanship of the plant is being manufactured on other premises, the contractor shall obtain for the engineer and for his duly authorised representative permission to inspect it as if the plant was manufactured on the contractor's own premises.

43.2 The engineer shall on giving seven days, notice in writing to the contractor setting out any grounds of objections which he may have in respect of the work, be at liberty to reject any drawing and all or any plant, or workmanship connected with such work which in his opinion are not in accordance with the contract or are in his opinion, defective for any reason whatsoever.

43.3 The contractor shall state in his tender the places of manufacture testing and inspection of various equipment offered by him. Unless specifically provided otherwise all tests shall be made at the contractor's works before shipment.

43.4 The contractor shall intimate atleast 15 days in advance through notice(s) about the readiness of material for despatch commensurate with specific delivery schedule so as to

enable the purchaser to depute his representative for inspection testing and checking of the material/equipment. For this purpose the date of receipt of the letter in the office of the purchasing authority shall be deemed as the date of call for inspection and not the date mentioned in the letter and the date of despatch. In case, material/ equipment is not found ready by the representative of the purchaser deputed for inspection to with tolerance of (-) 10% or if the inspection is not got carried out to the extent of the quantity indicated in the inspection call by any reason(s) on account of the supplier, an amount of Rs. 1500.00 only for the supplier work located in Rajasthan and an amount of Rs. 5000.00 only for the supplier's works located outside Rajasthan will become payable by the supplier on this account to the Director (Tech), RSDCL, Jaipur. The supplier will deposit the amount with the Director(Tech), RSDCL, Jaipur**,** immediately under intimation to this purchasing authority, failing which the subsequent call for inspection shall not be entertained.

43.5 The material/equipment shall be offered duly packed so as to enable the inspecting officer to seal. The supplier/ Contractor shall provide such packing of the goods as is required to prevent their damages or deterioration during transit to their final destination was indicated in the contract. The packing shall be sufficient to withstand without limitation rough handling during transit to their final destination as indicated in the contract. The packing shall be sufficient to withstand without limitation Rough handling during transit and exposure to extreme temperature salt and precipitation during transport and open storage. Packing case size and weights shall be taken into consideration where appropriate, remoteness of the goods final destination and absence of heavy mechanized handling facilities at all points in transit. The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract or in any subsequent instruction ordered by the purchaser.

43.6 In all cases where the contract provides for tests, whether at the premises of works of the contractor or any sub contractor, test at site the contractor except where otherwise specified shall provide free of charge to the purchaser, such labour, materials electricity fuel water, stores apparatus and instruments as may reasonably be demanded to carry out efficiently such tests of the plant, in accordance with the contract and shall give facilities to the engineer or his authorised representative to accompany such testing.

43.7 The purchaser reserve to himself the right of having any inspection or special test of a reasonable nature at contracts premises or at sites in addition to those prescribed in applicable standards and the enclosed technical specification.

43.8 When the tests have been satisfactorily completed at the contractor's sub-contractors works the engineer shall issue a certificate to that effect but if the tests were not witnessed by the engineer or his representative, the certificate would be issued after the receipt of test certificate by the engineer. No plant shall be shipped before such a certificate has been issued. The satisfactory completion of these tests or the issue of this certificate shall not bind the purchaser to accept the plant, should it on further tests after erection, be found not be comply with the contract.

43.9 The authorised representative of the purchaser shall have at all reasonable times access to the works and premises of the supplier and / or his associates if any, and shall be free to inspect the works, examine and test the product(s) including raw material used and the workmanship employed during/ after manufacture.

43.10 The supplier shall also furnish the latest calibration certificate of the testing instruments / equipment used for the testing of the material / equipments as covered in the purchase order, to

the inspecting officer. The testing instruments / machines should be got calibrated by the supplier from time to time from the manufacture of the testing instruments or any Govt. recognised testing laboratory. The calibration certificate should not in any case, be older than one year at the time of presenting the same to the Inspection Officer. In case however, the supplier fails to comply with the conditions as aforesaid a certificate in writing of the inspector / representative of the purchaser that the supplier has failed to provide the facilities shall be conclusive.

43.11 Unless the inspection is specifically waived, no material shall be despatched without inspection and clearance for despatch by the purchaser's representative.

43.12 The owner reserve the right to reject all or any part of the material being manufactured or awaiting despatch, due to any defect or deviations from the standard specification prescribed as observed during the inspection. In case of any dispute/ difference in this regard the decision of the Director (Tech), RSDCL, Jaipur shall be final and binding.

43.13 The purchaser also reserves the right to get the material/ equipment tested in any recognised Government Laboratory & claiming any compensation or rejecting the material/ equipment, if not found in accordance with the specification. All charges consequent to such rejection and replacement/ rectification shall be borne by the contractor.

44.0 FURTHER CORRESPONDENCE:

All correspondence pertaining to the bidding documents in respect of any clarification required should be addressed to the Director (Technical) Rajasthan Solar Park Development Company Ltd., E-166,Yudhishthir Marg C-Scheme , Jaipur.

45.0 ACCEPTANCE OF THE ORDER:

The order shall be placed in favour of the successful bidder. The successful bidder, on receipt of the order, shall convey the acceptance of order to the Director (Tech) Rajasthan Solar Park Development Company Ltd., E-166,Yudhishthir Marg C-Scheme , Jaipur, within ten days of the receipt of order, failing which, it will be presumed that all the terms and conditions incorporated in the order are acceptable to the successful bidder.

46.0 NODAL OFFICER & GENERAL APPROVALS.

46.1 The Director (Tech) RSDCL shall appoint a nodal officer for site monitoring of electrical and de-bottlenecking, timely completion of mile stones on RSDCL part.

46.2 For taking decisions regarding works beyond scope of contract, prior approval before taking up works from followings shall be required as under:

Electrical works: GM-II in concurrence with Director (Tech.).

47.0 EXTENSION OF TIME FOR COMPLETION OF WORKS:

Should the amount of extra or additional work of any kind or any cause of delay referred to in these conditions or other special circumstances of any kind whatsoever which may occur, other than through a default of the Contractor, be such as fairly to entitle the Contractor to an extension of time for the completion of the works, the engineer shall determine the amount of such extension

and shall notify the owner and Contractor accordingly provided that the Engineer is not bound to take into account any extra or additional work or other special circumstances unless the Contractor has within twenty eight days after such work has commenced, or such circumstances have arisen, or as soon thereafter as is practicable, submitted to the Engineer's representative full and detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

48.0 CLIMATIC AND ISOCERINIC CONDITIONS:

48.1 The equipment offered by you shall conform in all respects to the relevant Indian Standard Specifications except where stated otherwise in the order. Special care shall be taken in the design and manufacture of the Equipment to take into account the tropical conditions such as high temperature, excessive humidity, dust and salt laden atmosphere as detailed below:-

i)	Maximum ambient air temperature in shade.	50° C
ii)	Minimum temperature of air in shade	(-)5° C
iii)	Maximum relative humidity	100%
iv)	Minimum relative humidity	10%
v)	Altitude above Mean sea level varies from	61M to 815M
vi)	Dust storms are liable to occur during the period from	March to July.
vii)	Average No. of thunder storm days per annum	40
viii)	Average No. of tropical monsoon (condition) per annum	4 Months (June to September)
ix)	Average annual Rainfall.	10cms to 100cms
x)	Mean annual temperature	32° C
xi)	Maximum wind pressure	195 Kg/Sq.m
xii)	Seismic level (Horizontal acceleration)	0.3 g
xiii)	Degree of Pollution	Heavy

48.2 TROPICAL TREATMENT:

All the Equipment shall be suitably designed and treated for normal life and satisfactory operation under the Hot and hazardous tropical climatic conditions specified under clause 63.1 above shall be dust and vermin proof. All the parts and surface which are subject to corrosion shall be made of such material and shall be provided with such protective finish as would protect the Equipment installed from any injurious effect of excessive humidity.

49.0 MINOR ACCESSORIES FOR COMPLETION OF THE SUPPLY:

The Contractor shall supply all minor accessories required for the completion of supply which have either not been specifically mentioned in this specification or in Bid offer.

50.0 MATERIAL AND WORKMANSHIP:

All the Equipments/ material shall be of best quality and capable of satisfactory operation under the climatic humid tropical conditions mentioned above. The workmanship shall be of the highest grade and the entire manufacture shall be in accordance with the best modern Engineering practices.

51.0 INDIAN ELECTRICITY ACT:

All the supplies covered by the Contract shall be in accordance with the Indian Electricity Act, 2003 with the latest amendments and the Electricity rules made there under.

52.0 SITE TESTS:

The purchaser reserves the right to carry out any site tests he may decide upon at his own expenses. In case the material is not found as per Purchase order, all expenses incurred during the site testing will be to supplier's account and the material shall be replaced by supplier at site, free of cost.

53.0 AFTER SALES SERVICE:

The material supplied against this order shall be attended by the Contractor at his cost within the Guarantee period.

54.0 LATENT DEFECTS:

Any material or part thereof that develops defects not disclosed prior to the final acceptance by the Purchaser but are disclosed within one year after the material is placed in service shall be promptly replaced by supplier free of charge and all expenses, for the transportation and other incidental charges for such replacements shall be borne by the supplier.

55.0 BANKRUPTCY:

If the Contractor shall die or dissolve or commit any act of bankruptcy or being a Corporation commence to be wound up except for reconstruction purpose of carry on its business under a receiver, the executors successors or other representative in law of the state of the Contractor or any such receiver, liquidator, or any person in whom the Contract may become vested, shall forthwith give notice thereof in writing to the purchaser and shall for one (1) month during which he shall take all reasonable steps responsible to prevent stoppage of the works, have the option of carrying out the contract subject to his or their providing such guarantee, as may be required by the Purchaser but not exceeding the value of the work for the time being remaining as un-executed, provided however, that nothing above said shall be deemed to relieve the Contractor or his successors of his or their obligations under the contract under any circumstances. In the event of stoppage of the works, the period of the option under this clause shall be fourteen (14)days only. Provided that, should the above option not be exercised, the Contract may be determined by the purchaser by notice in writing to the Contractor and it shall be lawful for the Purchaser to take the work full or in part out of the Contractor's hands and re-contract at reasonable prices with any other persons and the Purchaser shall be entitled to retain and supply any balance which may be otherwise due on the Contract by him to the Contractor, or such part thereof as may be necessary to the payment of the cost of executing such work as aforesaid.

ANNEXURE-I

SECURITY BANK GUARANTEE

(On non-judicial stamp paper of requisite value)

Bank Guarantee in lieu of Security deposit on non-judicial stamp paper of Rajasthan Govt. worth Rs-----(stamp paper value as required as per Govt./ RSDCL norms).

The Managing Director,
Rajasthan Solar Park Development Company Ltd..
JAIPUR

In consideration of the Managing Director, Rajasthan Solar Park Development Company Limited , Jaipur (hereinafter called the Purchaser/Owner) having agreed that in respect of order No._____ dated _____ (hereinafter referred to as contract) placed with M/s. _____ having their registered office at _____ (herein after called the contractor) the contractor need not furnish the security deposit in cash and/or Bank Draft. We the _____ (hereinafter called the Bank) undertake to pay the purchaser on demand the sum or sums of money payable as security deposit by the contractor in respect of Order No. _____ dated _____ placed by the RSDCL with the contractor subject to the following terms & conditions.

(1) Payment persuant in this undertaking will be demanded by the purchaser from the Bank and will be met by the Bank without question in the case in which the Contractor, on receipt of the order and/or after the acceptance of this tender has been communicated to him by the purchaser, make default in entering into an agreement or having entered into such Agreement or otherwise the contractor makes default in carrying out the contract thereof. As to whether the occasion or ground is arisen for such demand the decision of the Managing Director, RSDCL shall be final.

(2) The liability of the Bank shall not at any time exceed to Rs. _____ (Rupees _____)

(3) The undertaking will be determined on _____ but will not withstanding such determination, continue to be in force till the expiry of 3 months from the date of completion of work of metering system complete in all respect as per specification against the aforesaid order.

(4) No variation in the terms of tender, acceptance or agreement as between the contractor and the purchaser made without the purchaser's consent shall discharge this undertaking.

(5) No indulgence or grant of time by the purchaser to the contractor without the acknowledgement of the Bank will discharge the liabilities of the Bank under this guarantee.

(6) The guarantee herein contained shall not be affected by any change in the constitution of the contractor.

(7) Notwithstanding anything contained herein before the Bank's liability under this guarantee is restricted to Rs._____ (Rupees _____) and the guarantee shall remain in force upto _____ unless demand or claim in writing is presented on the Bank within 3 months from the date, the Bank shall be released and discharged from all liabilities there under.

8) All disputes arising under the said guarantee between the Bank and the COMPANY or between the contractor and the Company pertaining to the guarantee shall be subject to the jurisdiction of Courts only at Jaipur in Rajasthan.

(9) The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the Managing Director, RSDCL.

IN WITNESS WHEREOF the Bank has executed these presents the day _____ and year _____.

Yours faithfully,

Bankers (EXECUTENT)

Signed by the above named Bank in presence of :-
(Signature with full Name and Address)

Witness :

1._____

2._____

Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

ANNEXURE-II

Performance Bank Guarantee Form
(On Non-judicial Stamp Paper of requisite value)

To,

The Managing Director,
Rajasthan Solar Park Development Company Ltd.
JAIPUR

Dear Sir, .

THIS DEED OF GUARANTEE is made this day _____ of _____ of the year _____ between the Managing Director, Rajasthan Solar Park Development Company Limited (which expression shall unless excluded by or repugnant to the context includes his successors and assignees) of the one part and the _____ hereinafter called "The Bank" (which expression shall unless excluded by or repugnant to the context includes its successors and assignees) of the other part.

WHEREAS MESSERS _____ (hereinafter called contractor) agreed for supply of material and equipments and erection, testing and successful commissioning & execution of civil works & handholding of 220kV GSS _____ _____ (Name of GSS, works) to the Managing Director, Solar Park Development Company Ltd, JAIPUR against order No. _____ dated _____ (hereinafter referred to as the contract).

AND WHEREAS as per the terms of the contract it was provided that the contractors should furnish a Bank Guarantee equivalent to _____% _____of the total contract value (supply of material /equipments, and ETC charges) by way of security for supplying free of cost any material /equipment, carrying out of erection/ commissioning and civil works that may be required due to defect arising from faulty materials, design and workmanship, so as to make it meet the guarantee and requirements of the contract.

AND WHEREAS at the request of the contractors the Bank has agreed to execute these present.

NOW THIS INDENTURE WITNESS AND IT IS HEREBY AGREED AND Rajasthan Solar Park Development Company Limited DECLARED by the and between the parties hereto as follows:

1. The Bank hereby guarantees to the , the fulfillment by the contractors of the various obligations imposed on them under the aforesaid contract including the obligations of the contractors to supply and install materials/equipments and test/ commission the equipments of the good quality and workmanship and the bank further guarantees to the RSDCL that the contractors shall substitute and supply and install, commission free of cost any material, equipment that may be required due to defects arising from faulty material, design and workmanship and the Bank undertakes to indemnity and keep the Managing Director, Rajasthan Solar Park Development Company Ltd JAIPUR indemnified to the extent of Rs._____(in words Rupees _____) against any loss or damage may be caused to or suffered by the

Rajasthan Solar Park Development Company Ltd by reason of any failure by the contractors to supply and install materials/ equipments of good quality, design and workmanship as aforesaid and further undertake to pay to the Managing Director, RSDCL on demand a sum not exceeding Rs._____ (Rupees _____) in the event of the contractor failing or neglecting to perform and discharge the aforesaid duties and obligations on their part to be observed and performed under the said contract indemnified to the extent of Rs._____(in words Rupees _____) against any loss or damage may be caused to or suffered by the Rajasthan Solar Park Development Company Ltd. by reason of any failure by the contractors to supply and install materials/ equipments of good quality, design and workmanship as aforesaid and further undertake to pay to the Managing Director, RSDCL on demand a sum not exceeding Rs._____ (Rupees _____) in the event of the contractor failing or neglecting to perform and discharge the aforesaid duties and obligations on their part to be observed and performed under the said contract
indemnified to the extent of Rs._____(in words Rupees _____) against any loss or damage may be caused to or suffered by RSDCL by reason of any failure by the contractors to supply and install materials/ equipments of good quality, design and workmanship as aforesaid and further undertake to pay to the Managing Director, RSDCL on demand a sum not exceeding Rs._____ (Rupees _____) in the event of the contractor failing or neglecting to perform and discharge the aforesaid duties and obligations on their part to be observed and performed under the said contract.

The decision of the Managing Director , RSDCL as to whether the contractor have failed or neglected to perform or discharge their duties and obligations as aforesaid and as to the amount payable to the Managing Director , RSDCL by the Bank herein shall be final and binding on the Bank.

2. The guarantee herein contained shall remain in full force and effect during the performance period that would be taken for the performance of the said contract and it shall continue to be enforceable till all the obligations to the RSDCL under or by force of the contract have been fully and properly discharged by the said contractor(s), subject however, to the conditions that the RSDCL will have not right under this guarantee after 12 months from the date of handing over of metering system complete in all respect after its successful commissioning provided further that if any, claim arises by virtue of this guarantee before the aforesaid date or extended guarantee period date if any, the same shall be enforceable against this bank notwithstanding the fact that the same is enforced after the aforesaid date.

The general guarantee period for all equipments, items, works etc. (except mentioned in the Technical specification of individual items) against this contract **TN-04** shall be 12 months from completion of work of metering system & its handing over to RSDCL and up to extended guarantee period if any as per provisions of contract.

3. The guarantee herein contained shall not be affected by any change in the constitution of the contractor(s) or Bank.

4. The Managing Director, RSDCL shall have the fullest liberty without affecting the guarantee to postpone for any time and from time to time any of the powers exercisable by the COMPANY against contractor(s) and either to enforce or forebear from enforcing any of terms and conditions of the said contract and the Bank shall not be released from its liability under this guarantee and exercise of the RSDCL of the liberty with reference to the matter raised or by the reasons time being given to the contractor(s) or any other forbearance act or omission on the part of the RSDCL to the contractors or by any other matter or thing whatsoever which under the law

relating to the sureties shall but for this provision have the effect of so releasing the bank from such liability.

5. Managing Director, RSDCL includes any other officer nominated by Managing Director, RSDCL.

6. The Bank further undertake not to revoke the guarantee during its currency except with the previous consent of the Managing Director, RSDCL in writing.

7. All disputes arising under the said guarantee, between the Bank and the Company or between the contractor and the Company pertaining to the guarantee, shall be subject to the jurisdiction of Courts, only at Jaipur in Rajasthan alone.

8. Notwithstanding anything contained herein before, the Bank's liability under this guarantee is restricted to Rs._____ (Rupees _____) and the guarantee shall remain in force upto _____ unless demand or claim in writing is presented on the Bank within six months from that date, the Bank shall be released and discharged from all liabilities thereunder. However the validity of the bank guarantee shall be extended as and when required by the Company.

9. IN WITNESS WHERE OF THE BANK HAS executed these presents the days and year written above.

Yours faithfully,

Bankers (EXECUTENT)

Signed by the above named Bank in presence of :-
(Signature with full Name and Address)

Witness :

1._____

2._____

Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

Annexure III

Rajasthan Solar Park Development Company Ltd. JAIPUR (RAJ.)
(On Rajasthan Government Non-Judicial Stamp of appropriate value)

AGREEMENT

This Indenture made at _____ on _____ this _____ day of the Month of _____ of the year _____ between the Managing Director, Rajasthan Solar Park Development Company Ltd. JAIPUR (RAJ.) Limited (hereinafter referred to as the Purchaser which expression unless the context does not permit includes successors and assigns) of the one part and

(I) To be used in case of Limited Companies

Messers_____ a private/Public Limited Company incorporated_____ under the _____ companies act and having its Registered office at _____ (hereinafter referred to as Contractor which expression unless the context does not permit includes their successors and permitted assigns).

(2) To be used in case of Partnership concerns

Messers _____ a Partnership Firm consisting of the following Partners namely:

(Name)	(Age)	(Residence)	(Occupation)
1.			
2.			
3.			
4.			

(hereinafter referred to as Contractors which expression unless the context does not permit includes their respective heirs, executors, administrators, legal representatives, permitted assigns)of the second part, witness the as follows:-

(1) The contractor, does by these presents agree to supply to the Purchaser and the Purchaser does agree to purchase from the Contractor the material specified in the Purchaser order No. _____ dated _____ and amendment letter No._____ dated _____ appended and on the terms & conditions constrained in the said order and amendment letter. The General terms of the contract appended hereto are considered a part of this agreement.

(2) The Contractor has deposited Rs._____ (In words Rs._____)

(a) In cash, or

(b) by furnishing a Demand Draft No._____dated _____ drawn in favour of _____ or

(c) by furnishing a Bank Guarantee equivalent to ____% of the Contract value, towards security deposit with the Purchaser for the performance of this agreement by the Contractor. The security deposit Receipt duly endorsed in favour of the Purchaser should be lodged to his safe custody.

(d) The contractor has not deposited any amount either in Cash or by furnishing Demand Draft /Bank Guarantee towards Security deposit but has agreed to accept _____% payment of each consignment as per stipulation (specified in clause relating to "Terms of Payment" of the Purchase Order).

(e) The contractor has agreed to deduct the amount Rs. _____ equivalent to _____% of the contract value from their first supply bill (s) towards Security deposit as per stipulations of the Purchase Order.

(3) The Specifications of the materials to be supplied under this agreement shall be as set forth in the Schedule referred to above.

(4) (a) The Contractor is to deliver the material:-

(i) Ex-work _____

(ii) To F.O.R. Destination(s) anywhere in Rajasthan by Goods Train.

(iii) Free delivery at Cotractor's Stores/ Site by Road Transport duly packed in good condition conforming to specification.

(b) Sales tax, duties and charges etc. which may be payable as per clause No. _____ of P.O. would be the contractor's liability and if incurred would be to his account.

(c) If so required by the Purchaser, the contractor will book the consignments by Rail/ Road to any destination stipulated by the Purchaser.

(d) In case the consignments to be insured to cover risks in transit, such insurance charges, if payable would be to the contractor's account.

(e) The Purchaser shall reimburse to the contractor all such expenditure, if any, that may be incurred by the contractor in this behalf under sub clause (b),(c) and (d) of this clause, if applicable as per provisions of contract by payment from time to time on receipt of the bills from the contractor supported by receipt or acknowledgement granted by Purchaser for supplies received.

(5) In case of dispute as to whether any materials supplied are or are not in accordance with specifications set-forth in the schedule, the decision of the Director(tech), RSDCL shall be final and binding on both the parties.

(6) The delivery shall be effected and completed as per clause No. _____ of the P.O. from the date of the Purchase Order and amendment letter No. _____ dt._____. The first installment of supplies will begin as per clause No. _____ of the P.O. and amendment letter No. _____ dt. _____ to the P.O.

(7) Payment of the price for the material supplied under this agreement shall as under :

(a) As per clause No. _____ of the Purchase Order and amendment letter No. _____ dt _____ to the P.O.

(8) The deposit made by the Contractor under clause (2) will be returned to the contractor after due fulfillment of this agreement by them.

(9) If the contractor fail wholly or in part to fulfill this agreement, the Purchaser shall be entitled at his discretion to retain the whole or any part of the deposit made by the contractor under clause (2) and if the loss suffered by the Purchaser exceeds the amount of said deposit, he will be entitled to recover the said loss from the Contractors.

(10) If any sum remains due or becomes recoverable from the contractor on account of the non-fulfillment of this agreement or on account of any other reason, the contractor shall pay the same immediately on demand, the Purchaser shall be entitled to recover the same from the contractor as arrears of Land Revenue.

(11) In witness of the due execution of this agreement the parties have hereunder set their hands the day and the year first above written.

Signed and delivered by

In case of Limited/Partnership Shri_____ (1)Signature
Companies & Firms Designation (2)Signature

For and on behalf of _____ (1)Signature
In presence of witnesses (2)Signature

Signed and delivered by
In case of individuals Shri_____ (1)Signature

Signed and delivered by
In case of Individuals Shri_____ (1) Signature

In the presence of witness:

(1) Shri_____ Designation (1) Signature
(2) Shri _____ Designation (2) Signature

Signed and delivered by the _____ RSDCL by order and on behalf of the MD of the Company.

Rajasthan Solar Park Development Company Ltd. JAIPUR (RAJ.)
(Seal to be affixed)

ANNEXURE-IV

PERFORMA OF BID BANK GUARANTEE
(For Earnest Money)

(Bank Guarantee in lieu of 80% of earnest money on nonjudicial Stamp Paper of Rajasthan Government worth Rs.100.00)

To,
The Managing Director,
Rajasthan Solar Park Development Company Ltd.,
JAIPUR (RAJ.)

1. Whereas ……..(name of the Bidder) (hereinafter called "the Bidder") has submitted its bid dated…….(date of submission of bid) for the construction of ……..(name of contract)(hereinafter called " the Bid").

2. KNOW ALL PEOPLE by these presents that WE……..(name of bank) of ……..(name of country), having our registered office at…….. (addresses of bank) (hereinafter called "the Bank"), are bound unto…….. (name of Purchaser) (hereinafter called " the Purchaser") in the sum of Rs.*_____ for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this ……day of ……20……

3. THE CONDITIONS of this obligation are :

(i) If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Bid Form;

or

(ii)If the bidder refuses to accept the correction of error in his Bid; or

(iii) If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:

(a) fails or refuses to execute the Contract Agreement, if required:

or

(b) fails or refuses to furnish the performance security, in accordance with the General Conditions of Contract.

4. We undertake to pay to the purchaser up to the above amount upon receipt of its first written demand, without the purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or all of the three conditions specifying the occurred condition or conditions.

5.The decision of the Managing Director, Rajasthan Solar Park Development Company Ltd, Jaipur shall be final whether breach has been committed on the right to demand the amount of guarantee from us which has accrued to the purchaser.

6. This guarantee shall not cease or determine, if the purchaser grants time or indulgence or vary the terms of the contract with the Contractor or without our consent or knowledge.
7. The guarantee herein contained shall not be affected by any change in the constitution of the Contractor.

8. We……further undertake not to revoke this guarantee during its currency except with the previous consent of the MD, RSDCL.

9. All disputes arising under the said guarantee between the Bank and the Company or between the Contractor and the Company pertaining to the guarantee, shall be subject to the jurisdiction of Courts in Jaipur, Rajasthan alone.

10. This guarantee will remain in force up to and including one hundred eighty (180) days after the date of the opening of bids, i.e. up to ……., with a further grace period of Ninety (90) days and any demand in respect thereof should reach the Bank not later than the above date.

Yours faithfully,

Bankers (EXECUTENT)

Signed by the above named Bank in presence of :-
(Signature with full Name and Address)

Witness :

1._____

2._____
Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

* The Bidder should insert the amount of the guarantee in words and figures denominated in the currency of bid.

ANNEXURE -V

PROFORMA OF AUTHORISATION LETTER

Rajasthan Solar Park Development Company Ltd. Jaipur (RAJ).

REF.NO.

DATE

To,

M/s._____

_____

_____.

Ref: Contract No._____ dated _____ for _____ awarded by RSDCL

Dear Sir,

Kindly refer to Contract No. _____dated _____ for _____ you are hereby authorised on behalf of RSDCL, having its Registered Office at E-166,Yudhishthir Marg, Jaipur and its project at _____ to take physical delivery of materials/ equipment covered under despatch Document/ Consignment Note No.*_____ dated _____ and as detailed in the enclosed schedule for the sole purpose of successful performance of the aforesaid contract and for no other purpose, whatsoever.

(Signatory of Project Authority)**

Designation _____

Date _____

Encl: As above.

** To be signed not below the rank of G.M.
* Mention LR/RR No.

SCHEDULE-I

(Must be filled in by the Tenderer and to be uploaded with Techno-commercial Bid, cover.2)

To,

The Director (Tech.),
Rajasthan Solar Park Development Company Ltd..
JAIPUR.

Dear Sirs,

With reference to your invitation to the tenderagainstspecification NO. RSDCL/ D(T)/ SOLARPARK/ BHADLA/ PHASE-II/ TN-04, we agree to design, supply and erection/ installation, testing and commissioning of the following direct items of metering system at designated locations on turnkey basis for which required Bid Security has been deposited:-

S.NO.	NAME OF DIRECT SUPPLY ITEMS
(a)	(b)

Note:- It is mandatory for the bidder to fill the above information correctly. All other items will be considered as Bought-out items except the item(s) indicated in column (b) above. For Bought out items, the bidder shall quote the ex-works price inclusive of all taxes & duties in the price schedule- A (i.e. BOQ1). For the bought out items, the bidder should not indicate/mention the rate of Excise duty & Sales tax/VAT in the price schedule- A (i.e. BOQ1).

1.The offer is valid for a period of 120 days after the date of opening of Techno-commercial Bid.

2.The prices of all the items shall be on 'FIRM' basis.

3.It is noted that the quantities as mentioned in the specification are approximate and we agree to supply any quantity as per your requirement.

4.The completion period of work of metering system shall strictly be in accordance with Clause No. 9 of Volume-II (Part I) of this specification. In case, we fail to complete the work of metering system as indicated in the clause No. 9 of Volume-II (Part I), we shall pay penalty as per Clause No. 14 of GCC Part-II, Volume-I of this specification.

5.The material shall conform to your specification No. RSDCL/D (T)/SOLAR PARK/ BHADLA/ PHASE-II/ TN-04 and as per relevant ISS in all respect.

6. We confirm that we agree to all the terms and conditions as well as the technical stipulations of your specification No. RSDCL/D (T)/SOLAR PARK/ BHADLA/ PHASE-II/ TN-04 and there are no deviations other than as specified in the Schedule-IV.

Yours faithfully,

(Signature)
Name & Designation with Seal of the firm

SCHEDULE-II

SPECIFICATION No. RSDCL/ Metering Scheme /TN-04
(To be uploaded with Techno-commercial Bid)

BID FORM

To,
The Director (Tech.),
Rajasthan Solar Park Development Company Ltd.,
JAIPUR-302001.

Sub:- Tender for execution of work of metering system on turnkey basis against Specification No. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04.

.

Dear Sir,

1. We the undersigned bidder have read and examined in detail, the specifications and documents under TN and hereby offer our bid for the supply/erection, testing, commissioning work of metering system at designated locations on "Turnkey Basis" against specification No. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04.

2. PRICE AND VALIDITY:

2.1 All the prices and price components stated in our proposal shall be FIRM in all respect independent of any variation.

2.2. The prices, all terms and conditions in our offer are valid for a minimum period of 120 days from the specified date of Techno-commercial bid opening.

2.3 We do hereby confirm that our FORD bid price as quoted in relevant schedules include all taxes, duties, , entry tax , octroi and other taxes, duties, levies payable by us in respect of transaction between us and our sub vendors in either while procuring any components, raw materials and the equipments for our own use or despatched directly from our sub vendors works (bought out items, equipments) to site, and we shall have no extra claim on this behalf. We also confirm that prices quoted for erection, testing, commissioning include all applicable taxes, duties and other levies like service tax, work contract tax etc. and we shall have no extra claim this regard.

2.4 All taxes such as concessional rate of Sales Tax, if applicable, as per Sales Tax Act, Excise Duty with cess, local taxes, octroi, entry tax and other levies in respect of transaction between you and us for all goods, despatched from our manufacturing works, if any, shall be to our account and have been included in our bid price.

2.5 The necessary sales tax declaration form for all items shall be issued by you on our request to avail concessional sales tax as per sales tax Act, if it is applicable.

2.6 We hereby confirm that if any Income Tax, Surcharge on Income Tax or any other Corporate Tax is attracted under the law, we agree to pay the same.

3. BID PRICING:

We further declare that prices stated in our proposal are in accordance with all relevant commercial terms and conditions specified in volume-I of the specification and we have not taken any deviation.

4. CONSTRUCTION OF THE CONTRACT.

We declare that we are making the offer on the basis of supply cum erection, testing, commissioning contract on single source responsibility basis. The supply portion of the contract relate to supply of the equipments and materials and the erection portion will relate to transportation, insurance, storage, erection, testing and commissioning etc. of equipment and materials as defined in bid documents. We declare that the award of separate supply, erection, testing & commissioning contracts will not in any way dilute our responsibilities for successful operation of equipments as per specifications (Volume- I & II) and that all these contracts will have a cross fall breach clause viz that a breach on one contract will automatically be classified as breach for the other contract which will confer on the OWNER, the right to breach to other contract at our risk and cost.

5. SPECIAL TOOLS AND TACKLES.

We agree that any items of special tools and tackles required for effective erection/ installation, testing, commissioning of metering system upto handing over of same to RSDCL shall also be provided by us at no extra cost to you.

6.0 BID GUARANTEE

We have enclosed a Demand Draft for a sum of Rs._____ in favour of Director (Fin), RSDCL Jaipur and a bank guarantee for a sum of Rs._____ in favour MD, RSDCL Jaipur as a bid security in accordance with bid documents.

7.0 CONTRACT PERFORMANCE GUARANTEE

We further agree that if our proposal is accepted we shall provide an irrevocable Contract Performance Guarantee, of value equivalent to ten percent (10%) of the total Contract value valid upto the end of ninety (90) days after the end of the contract guaranty period in the form of _____

(Please specify the form of Guarantee)

in your favour and enter into a formal agreement with you within fifteen (15) days from the date of issue of order(s) of Contract.

8.0 CONTRACT SECURITY GUARANTEE:

We further agree that if our proposal is accepted we shall provide an irrevocable contract security guarantee, equivalent to 2% of the total contract value valid upto the end of 90 (ninety) days after commissioning and handing over of metering system to RSDCL in the form of _____ (Please specify the form of guarantee) in your favour.

9.0 We, hereby declare that only the persons of firms interested in this proposal as principles are named herein and that no other persons or firms other than those mentioned herein have any interest in this proposal or in the contract to be entered into, if we are awarded the Contract,

and that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion of fraud.

Date this_____day of_____20.

Thanking you, we remain.

Yours faithfully,

Designation_____
(Printed name)

Designation_____
(common seal)_____

Business Address:
Country of incorporation (State or Province to be indicated)
Name and address of Principal Officer.

SCHEDULE-III

INFORMATION REQUIRED FROM FIRMS ALONGWITH THEIR TECHNO-COMMERCIAL BID (COVER.2)

Participating Firms shall furnish following information in separate statement along with Techno Commercial bid which will be opened on scheduled date of tender opening.

---

1. Firm's Details

Name

Address

2. Details to be furnished:

(i) Full Legal Name

(ii) Full Address of

(a) Registered Office

(b) Office where to correspondence to be made :

(iii) Authorised Contact Person (s) :
(Power of Attorney to be enclosed)

(iv) Phone No.

(v) Telex No.

(vi) Telefax No./Email.

(vii) Telegraphic Address :

(viii) Nature of registration of agency.
(Whether sole/Proprietor/Partnership/ Private Limited/Public Limited.)

(ix) Memorandum of Understanding and Articles of Association of the Agency.

3. BASIS OF PARTICIPATION :

The firm shall clearly indicate whether it:

Desires to take up the entire work of design, supply, installation and commissioning of ABT energy meters & its associated system, acquisition of data and its communication / transmission to the designated locations and to be completed as per specification.

4. EXPERIENCE IN EXECUTION OF SUPPLY AND ETC OF METERING SYSTEM
Agencies intending to participate for these works should furnish briefly their past experience.

.

7.**(a)** Indicate the responsibilities undertaken In the field of specialisation undertaken in executing metering system

(i) Design and engineering
(ii) Preparation of specification for procurement items.
(iii) Procurement
(iv) Construction and erection.
(v) Testing and commissioning.
(vi) Performance guarantee(s)
(vii) Operation and maintenance.

8. What was the financing arrangement for above work ? Whether the funding was done by the Agency or through a separate financial institution.

9. FINANCIAL DETAILS.
Agencies are required to furnish details of financial structure of the company and provide Annual Financial Report, Balance sheet, Profit & Loss account of the company for the past 5 (five) years. Further clearance certificate :
a) Annual Financial Report.
b) Balance Sheet.
c) Solvency Certificate.
d) ITCC.

10. Agencies are required to indicate funding proposals for metering system.
(i) Equity proposed to be brought in:
(a) by the single bidder/lead partner of Joint venture.
(b) other collaborators/ Joint venture partners/ Financial Institution(s).

(ii) Debt profile/source of debt.

(a) Indian
(b) Suppliers credit etc.

11. ORGANISATIONAL STRUCTURE AND CAPABILITY.

Agencies should furnish the following information/document in respect of their organisation :

(i) Corporate structure.

Details of various divisions/departments including manpower available and responsibilities undertaken by such divisions/departments.
(ii) List of similar work executed by the agency.
(iii) Proposed organization structures for execution of work under consideration.
(iv) Any other information which the Agency considers relevant.

NOTE : Please furnish documents in support of the above, wherever necessary.

PLACE : STATUS NAME
ADDRESS OF FIRM
DATE: SEAL OF THE FIRM

SCHEDULE-IV

NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

DEVIATION FROM SPECIFICATION

(To be furnished separately for commercial/technical deviations)

All the deviations from this specification No. **NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04** if any, shall be set out by the tender clause in this schedule only. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm to the specification. Deviations mentioned elsewhere in the bid shall not be considered.

S.No.	Clause no.	Existing text	Proposed deviation	Justification/ Reasons
1	2	3	4	5

NOTE: Deviations mentioned elsewhere in the bid shall not be considered by the owner.

PLACE:

DATE:

SIGNATURE OF BIDDERS
STATUS
NAME
SEAL OF THE FIRM

RAJASTNAN SOLAR PARK DEVELOPMENT COMPANY LTD
(A GOVT. OF RAJASTHAN UNDERTAKING COMPANY)

TURNKEY PROJECT FOR

DESIGN, SUPPLY, ERECTION/ INSTALLATION AND COMMISSIONING OF ABT ENERGY METERS & ITS ASSOCIATED SYSTEM, ACQUISITION OF DATA AND ITS COMMUNICATION / TRANSMISSION TO THE DESIGNATED LOCATIONS.

(VOLUME-II)

(Part- I)

TECHNICAL SPECIFICATION

NO. RSDCL/D(T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

GENERAL REQUIREMENT

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

Volume-II
(PART-I)

TECHNICAL SPECIFICATION (GENERAL REQUIREMENT)

Telemetry and AMR System to be provided at designated locations of M/s Rajasthan Solar Park Development Company Ltd. for SLDC at Heerapura, Jaipur (Rajasthan).

1.0 PREAMBLE:

1.1 Rajasthan Solar Park Development Company Ltd. is a subsidiary Company of Rajasthan Renewable Energy Corporation Ltd. (A Govt. of Rajasthan Undertaking) is developing 2Nos. 220kV Pooling Stations & associated 220kV & 132kV Transmission Lines at Bhadla Solar Park Phase-II for evacuation of Solar Power from the projects at Bhadla.

1.2 As part of the ever increasing transmission system of the State, ABT energy meters are to be installed at RSDCL's Pooling Stations & RVPN's 400kV GSS, Bhadla and the data from these meters are required to be transmitted to RVPN's 400kV GSS, Bhadla and SLDC & CBS, Heerapura, Jaipur.

1.3 RSDCL intends to install an automatic meter reading and communication system which shall be capable of obtaining data from the ABT energy meters to be installed at designated 220 kV pooling stations of RSDCL & 400 kV GSS, Bhadla of RVPN and transmitting it to the SLDC & CBS at Heerapura, Jaipur. There should be a provision to expand the system in future.

2. Scope:

This covers the design, engineering, supply, erection, testing & commissioning of data communication system at designated locations for transmission of data to SLDC, Heerapura, Jaipur (Raj.) as per requirement of M/s Rajasthan solar Park Development Company Ltd., Jaipur.

The system should have following features:

i) To provide telemetry parameters to SLDC at Heerapura, Jaipur.
ii) To provide ABT billing parameters to CBS at Heerapura, Jaipur.
iii) To generate own bills for Pooling Stations at Bhadla Solar Park Phase-II.

2.1 Telemetry System:

To collect required parameters (analog and status) from 2 Nos. Pooling Stations and provide the same to SLDC- Heerapura, Jaipur.

System Requirements:
i) To collect meter parameters and status information from 2 Nos. 220KV Pooling Stations of RSDCL at Badla Solar Park Phase-II.

ii) Each Pooling Station has the following system:
   a) 220KV Lines -2
   b) 220/ 132KV, 160 MVA Transformers -3
   c) 132/33KV, 20/25 MVA Transformer -1
   d) 220KV Bus coupler -2

iii) To collect all required parameters from existing SCADA system using IEC-104 master protocol.

iv) To transmit all parameters to SLDC at Heerapura via GPRS.

v) To provide these parameters to SLDC SCADA via IEC-104 slave protocol.

2.2 AMR System:

To collect ABT parameters from interface meters and provide billing information for each solar plant connected to the Pooling Stations.

System Requirements:

i) Five solar plants are connected to each Pooling Station.

ii) Each Pooling station will have two ABT meter on 220kV lines.

iii) 2 Nos. 220 KV lines from each Pooling Station are connecting to 400 KV GSS, Bhadla. Each line will have main and check ABT meter at 400kV GSS end totalling to eight ABT meters at 400kV GSS for our 4 Nos. 220kV lines.

iv) Transmit all billing parameters of 96 blocks of a day to CBS at Heerapura, Jaipur via GPRS.

v) Provide all billing parameters to CBS at Heerapura, Jaipur and update the same in CBS database (SQL or Oracle).

vi) Provide all billing parameters at one of the Pooling Stations and make bills as per injection provided by each solar plant at 132kV level. Transformer and transmission losses are to be account for while making the bills.

3. Data Communication Scheme:

Data communication system may be based on Motorola or other RTU system but it should be capable of proper functioning as per requirement of RSDCL. Bidder may setup billing system at Pooling Station-1 or 2. RTU shall be installed at both Pooling Station sites. These systems will collect required parameters and transmit telemetry parameters to GPRS Communication Gateway at SLDC – Heerapura, Jaipur. Billing parameters will be transmitted to GPRS Communication Gateway at CBS, Heerapura. Billing parameters for Pooling station-2 (In case billing system is setup at Pooling Station-1) will also be transmitted to Pooling Staion-1 via RF link.

Motorola/ other DCU at 400KV GSS will collect required billing parameters from ABT meters and transmit the same to Pooling Stations-1 via RF communication link. These parameters will be used for loss calculations. GPRS Communication Gateway at Heerapura will provide all the parameters to SLDC SCADA via IEC-104 Slave protocol. GPRS Communication Gateway at CBS will provide all the billing parameters to CBS data base.

3.1 DCU System for 400KV GSS:

Motorola/ other DCU System at 400KV GSS site will read ABT meter parameters and transmit the same to Pooling Station-1 via RF link.

3.1.1 DCU System:

Motorola/ other DCU panel at 400KV GSS site will be consisting of following:

i) Motorola/ other DCU CPU.
ii) Serial RS485 Port-1: To read meter parameters from ABT Meters using MODBUS RTU protocol from ABT Meter panel.
iii) Serial RS485 Port-2: To read meter parameters from ABT Meters using MODBUS RTU protocol from ABT Meter panel.
iv) Ethernet port: for DCU configuration and RF communication link.
v) Required hardware (RF antenna, POE, reflectors and SPT cable) for communication with Pooling Station-1 via RF.
vi) Power supply UPS 220V AC - 1KVA.
vii) Power supply cable for the DCU panel.
viii) The RTU system shall be mounted in self-standing sheet metal panel duly wired with required terminals.
ix) Required pole (three meters) for RF communication link to Pooling Station-1.

3.1.2 ABT Meter Box:

ABT meter Box at 400KV GSS will be consisting of following:

i) Each meter box will have four ABT meters.
ii) Meter box shall be self-standing and sealable. The meter box shall be suitable for outdoor installation also.
iii) Existing CT and PT shall be used for data.
iv) ABT meters will be interfaced to Motorola/ other DCU system at the site via serial RS485 communication using MODBUS RTU protocol.
v) Required power supply cable for the metering Box.

3.2 Motorola/ other RTU System for Pooling Station-2:

Motorola/ other RTU System at Pooling Station-2 will have following functions:

i) Collect telemetry parameters (analog and DI status) from existing SCADA via IEC-104 Master and transmit the same to GPRS Communication Gateway at SLDC-Heerapura, Jaipur via GPRS Modem.
ii) Collect all billing parameters from all ABT meters and transmit the same to CBS, Heerapura via GPRS.
iii) Transmit all ABT parameters to Pooling Station-1 via RF communication link.

3.2.1 Motorola/ other RTU System for Pooling Station-2:

RTU panel at Pooling Station site-2 will consist of the following:

i) Motorola/ other RTU CPU.
ii) Serial RS485 Port-1: To read meter parameters from ABT Meters using MODBUS RTU protocol.
iii) Serial RS232 Port-1: interface to GPRS Modem-1 to transmit parameters to Gateway at SLDC – Heerapura, Jaipur and CBS.
iv) Serial RS232 Port-2: interface to GPRS Modem-2 (redundant GPRS modems) to transmit parameters to Gateway at SLDC-Heerapura and CBS.
v) Ethernet port-1: For communication with existing SCADA for telemetry parameters.
vi) Ethernet port-2: For RTU configuration and communication with Pooling Stations-1 via RF communication link.
vii) Required hardware (RF antenna, POE, reflectors and SPT cable) for communication with Pooling Station-1 via RF.
viii) Power supply UPS 220V AC- 1KVA.
ix) Required power supply cable.
x) The RTU system shall be mounted in self-standing sheet metal panel duly wired with required terminals.
xi) Required pole (three meters) for RF communication link to Pooling Station-1.

3.2.2 ABT Meter Box:

ABT meter Box at Pooling Station-1 will have the following:

i) Two ABT meters will be installed in one meter Box.
ii) Meter Box shall be self-standing and sealable and suitable for outdoor installation also.
iii) Existing CT and PT shall be used.
iv) ABT meters will be interfaced to Motorola/ other RTU system at the site via serial RS485 communication using MODBUS RTU protocol.
v) Required power supply cable for the metering panel.

3.3 Motorola/ other RTU System for Pooling Station-1:

Motorola/ other RTU System at Pooling Station-1 will have following functions:

i) Collect telemetry parameters (analog and DI status) from existing SCADA via IEC-104 Master and transmit the same to GPRS Communication Gateway at SLDC-Heerapura, Jaipur via GPRS Modem.

ii) Collect all billing parameters from all ABT meters and transmit the same to CBS via GPRS.
iii) Receive billing parameters from 400KV GSS, Bhadla and Pooling Station-2 via RF communication link.
iv) Provide all billing parameters to Billing System PC.
v) Prepare billing details for each solar plant considering injection from the plant and total system losses.

3.3.1 Motorola/ other RTU System:

Motorola/ other RTU panel at Pooling Station site-1 will have the following:

i) Motorola/ other RTU CPU.
ii) Serial RS485 Port-1: To read meter parameters from ABT Meters using MODBUS RTU protocol.
iii) Serial RS232 Port-1: Interface to GPRS Modem-1 to transmit parameters to Gateway at SLDC-Heerapura, Jaipur and CBS.
iv) Serial RS232 Port-2: Interface to GPRS Modem-2 (redundant GPRS modem) to transmit parameters to Gateway at SLDC-Heerapura, Jaipur and CBS.
v) Ethernet port-1: For communication with existing SCADA for telemetry parameters.
vi) Ethernet port-2: For receiving billing parameters from Pooling Station-2 and 400KV GSS via RF communication link.
vii) Ethernet port-3: For RTU configuration and interface to Billing System PC.
viii) Required hardware (RF antenna, POE, reflectors and SPT cable) for RF communication link with Pooling Station-2 and 400KV GSS, Bhadla.
ix) Power supply UPS 220V AC -1KVA.
x) Required power supply cable.
xi) The RTU system shall be mounted in self-standing sheet metal panel duly wired with required terminals.
xii) Required pole (three meters) for RF communication link.

3.3.2 ABT Meter Box:

Details of ABT meter Box at Pooling Station-1 shall be as under:

i) Two ABT meters will be installed in the meter Box.
ii) Meter Box shall be self-standing and sealable and suitable for outdoor installation also.
iii) Required power supply cable for the metering Box.

3.3.3 Billing System at Pooling Station-1:

Billing system at Pooling Station-1 will receive billing parameters from Pooling Stations -1, 2 and 400KV GSS, Bhadla. The system will perform following functions:

i) Collect all the billing parameters from Motorola/ other RTU system.
ii) Verify the received parameters and save the same in local database.
iii) Calculate losses in sub-station transformers and transmission lines connected to 400KV GSS, Bhadla.
iv) Distribute proportionally, the losses to clients.
v) Prepare billing parameters based on injection and losses.

Billing system will consist of the following:

i) Data collection software to collect parameters from Motorola/ other RTU.
ii) Billing PC system with SQL.
iii) Loss calculation and billing software.
iv) Printer

3.4 GPRS Communication Gateway System for SLDC-Heerapura, Jaipur:

GPRS Communication gateway system at SLDC-Heerapura, Jaipur will receive telemetry parameters from two Pooling Stations and provide the same to SLDC- SCADA via IEC-104 slave port.

3.5 GPRS Communication Gateway System for CBS at Heerapura:

Motorola GPRS Communication gateway system at CBS will receive billing parameters from all sites (all ABT meters) and provide the same to CBS database.

This system will consist of the following:

i) Motorola/ other CPU with required ports.
ii) Broadband modem and LAN switch.
iii) Database interface PC- rack mounted with data acquisition software. The PC will write billing parameters in CBS database.
iv) Data collection software to collect parameters from Motorola/ other RTU.
v) Power supply 220V AC 1KVA UPS.
vi) Required power supply cable.
vii) All above equipment shall be mounted in self-standing sheet metal panel.

4. System BOM: BOM for proposed system is given here under:

S. No.	Name of item	Unit	Quantity
1	2	3	4
1	Motorola/ other ACE RTU CPU system with required communication protocols and ports.	No.	4
2	GPRS Modems for 2 Pooling Stations	No.	2
3	Broadband Modem for CBS	No.	1
4	Self-standing Panel for RTU system	No.	4
5	220V AC, 1KVA UPS	No.	4
6	Pole (three meters) for RF communication link	No.	3

7	ABT Meter with base software	No.	12
8	CMRI	No.	1
9	Meter Box suitable for four ABT meters and outdoor installation	No.	2
10	Meter Box suitable for two ABT meters and outdoor installation	No.	2
11	Hardware for RF communication link	set	3
12	RS485 Communication Cable	Meter	800
13	Billing PC with billing software for Pooling Station-1	No.	1
14	Printer for Pooling Station-1	No.	
15	Billing database interface PC with required software for CBS	No.	1
16	LAN Switch for CBS	No.	1
17	4C x 2.5 sq. mm Copper control cable	Meter	200
18	Power Cable	Meter	200

The quantity mentioned in the above table is tentative and may increase or decrease as per system requirements.

5. **AMC of the system**

The bidder shall quote the charges of AMC of the system for five years so that the RSDCL may consider the same for placement of a separate order. The period of AMC shall start after 12 Months of commissioning of complete system at all the designated sites. However, the charges of AMC quoted by the bidders shall not be considered for bid evaluation. The AMC will include the following:

i) Motorola/ other RTU and Billing System.
ii) CPU and IO Modules of Motorola/ other RTU System.
iii) Communication Modems.
iv) Power supplies and other hardware.
v) Any defective hardware during the AMC period will be replaced.
vi) Required spares will be made available at site within 72 hours.
vii) Communication link will be restored within 48 hours.
viii) Four annual routine check up visits on quarterly basis.
ix) Maintenance of Communication gateway system at SLDC, if required.

6. System Requirements:

System requirements are listed below. These will be provided by RSDCL at its own cost:

1. Mobile SIM card with GPRS service shall be provided for the two Pooling Station sites and all expenses for the same are to on RSDCL account.
2. Broadband service with static IP at CBS and Heerapura.
3. All GPRS and Broadband communication expenses shall be paid directly to the service provider by RSDCL.
4. Interoperability table IEC-104 service at the Pooling Stations.

7. Guarantee: The system including all equipments & material (Except ABT Meters) shall be guaranteed for a period of Twelve Months from the date of successful commissioning of complete system at all the sites. However, the guarantee period for ABT Meters shall be of 5 years from its successful commissioning in the system or five & half years from its supply at sites whichever is earlier.

8. Validity: Offer(s) shall be valid for an initial period of 120 days which shall be extended further by the bidders without any extra charges, if required by RSDCL.

9. Work completion period: The work completion period for supply, erection/ installation & commissioning of the metering scheme shall be 60 days from the date of issue of LOA.

10.0 <u>Make of ABT meters:</u>

The ABT meters shall be supplied from M/s L&T Ltd., M/s Secure Meters, M/s Wallaby and M/s Genus makes only.

RAJASTNAN SOLAR PARK DEVELOPMENT COMPANY LTD
(A GOVT. OF RAJASTHAN UNDERTAKING COMPANY)

TURNKEY PROJECT FOR
DESIGN, SUPPLY, ERECTION/ INSTALLATION AND COMMISSIONING OF ABT ENERGY METERS & ITS ASSOCIATED SYSTEM, ACQUISITION OF DATA AND ITS COMMUNICATION / TRANSMISSION TO THE DESIGNATED LOCATIONS.

(VOLUME-II)

(Part-II)

TECHNICAL SPECIFICATION

NO. RSDCL/D(T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

OF

METERING SYSTEM

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

SPECIFICATION OF INSTALLATION AND ACQUISITION OF DATA FROM ABT ENERGY METERS AND ITS COMMUNICATION/TRANSMISSION TO CENTRAL BILLING STATION AT HEERAPURA, JAIPUR.

1.0 GENERAL.

1.1 This document describes the requirement of the data acquisition from the ABT energy meters (Main) and to communicate/ transmit the data to the CS Heerapura as per requirement of RSDCL.

1.2 The Bidder shall be required to establish data acquisition / monitoring system for extracting the data from the meters. Any associated equipment and panels, etc. if required for housing of all the hardware envisaged for the data acquisition system, the communication system, transmission of the data to the CS shall be in the scope of the Supplier.

1.3 The Bidder shall be responsible for design, planning, engineering, supplying hardware, software, and installation, cabling and field implementation for the data acquisition and transmission system as defined in this Specification. The Bidder shall also provide complete documentation, training (free of cost) and testing facility to fully support the hardware and software provided.

1.4 The data acquisition and transmission system shall be used for obtaining the real time data from the meters and transmitting the same to the CBS at Heerapura. Strict compliance should be made to standards, scalability, and modular and open architecture.

1.5 The owner may not initially use all capabilities of the system specified in this document. However, regardless of the system purchased, the system shall be capable of all functions specified herein. The optional functions, if any specified in the specifications, may be implemented with the addition of necessary hardware and software modules in the field as and when required by the owner without any additional financial implications except for hardware cost, if any.

1.6 It is the Owner's intent that the Bidder uses as much standard hardware and software as possible. However, all of the functional requirements of this specification must be satisfied. The use of the Supplier’s standard hardware and software may cause the Bidder to conclude that there is a need for additional items not specifically mentioned in this specification. The Bidder shall supply all such items and provide a complete system design that meets all of the Owner's functional requirements defined in this specification.

1.7 The connection of the total quantity of meters shall be in the scope of work.

1.8 The scope of work shall be as under:

Design, supply, Installation & commissioning of ABT energy meters as detailed below, necessary hardware and software for implementation of metering system at designated pooling stations, RVPN’s 400kV GSS, Bhadla and CS at Heerapura, Jaipur for metering, data collection and communication of data from ABT meters.

PROPOSED METERING SCHEME.

2.1 The data real time on line data of all ABT meters to be installed in RSDCL & RVPN system are to be transmitted at time intervals of 15 minutes (integration block time) to the Central Billing Station at Heerapura, Jaipur and also at designated location of RSDCL for preparing Bills.

2.2 The following parameters (15 minutes block time) are required to be transmitted from the ABT meters to the CS.

Load Survey Parameters :- The parameters listed below in this Table are for load survey purpose and are logged as per the block period time i.e 15 minutes for which the data storage will be 22 days.

S.No.	Parameters
1	Real time clock, date and time.
Average Value of 15 minutes block period.	
1	Frequency
2	Voltage V_{RN}
3	Voltage V_{YN}
4	Voltage V_{BN}
Actual Energy consumption during 15 minutes Time Block	
1	Energy – Active Import
2	Energy – Net active energy
3	Energy - Active Export
4	Energy kVarh, Quadrant -I
5	Energy kVarh, Quadrant -II
6	Energy kVarh, Quadrant -III
7	Energy kVarh, Quadrant -IV

Daily Load Profile Parameter: - The parameters listed below in the Table are meant for billing purpose and shall be logged at mid night (00.00 Hours). The storage time for these parameters is 22 days.

S.No.	Parameters
1	Real time clock, date and time.
2	Cumulative energy, kWh (Import)
3	Cumulative energy, kWh (Export)
4	Cumulative energy, kVAh while kW import
5	Cumulative energy, kVAh while kW Export
6	Reactive energy high (V > 103 percent)
7	Reactive energy low (V < 97 percent)
8	Cumulative energy, kVarh, Quadrant-I
9	Cumulative energy, kVarh, Quadrant-II
10	Cumulative energy, kVarh, Quadrant-III
11	Cumulative energy, kVarh, Quadrant-IV

2.3 The monthly billing data and tamper data, etc. as per energy meter specifications from the ABT meters are to be communicated to the CS.

2.4 The period of completion of the scheme will be 2-months from the date of issue of PO.

2.5 In case the supplier fails to timely obtain/ display/ transmit the required data through the network provided, it shall be the responsibility of the supplier to arrange the data by alternate means at the Central Station and other places within the stipulated period for the desired purpose during the AMC period.

2.6 Installation, commissioning & transmission of data of new meters required by RSDCL in future due to expansion of network during the 5 years period (AMC period) shall be done by the supplier. For this purpose, unit rate of service charges shall be indicated by the bidder for installation, commissioning & transmission of data into the system.

3.0 COMMUNICATION SYSTEM REQUIREMENT

3.1 The energy meter data collected from ABT meters is required to be transmitted to the CBS at 400 kV GSS Heerapura, Jaipur at intervals of 15 minutes blocks, the first starting from 00:00 Hrs. every day.

3.2 The data is required to be transmitted within the first 2 minutes after the end of every block time so that it can be compiled at the earliest.

3.3 The telemetering data shall also be provided to SLDC, Heerapura, Jaipur as per their system requirements.

3.3 The bidder is free to adopt any architecture for consistent communication of the data. The details of the architectures of the communication system proposed by the bidder shall be enclosed with his bid. Bidder shall use GPRS communication technology for data communication.

4.0 TIME SYNCHRONIZATION

4.1 The system to be installed shall maintain real– time clock and shall have an internal time base with a stability of 1 ppm, i.e., 3.6 milliseconds per hour or better. The system shall maintain the real – time clock information even when the auxiliary power to the system is switched OFF.

4.2 The accuracy of the internal clock shall be maintained by protocol messages from a GPS to be installed. The system time will be set from time synchronization messages received from the GPS at every 10 minutes. The system shall be provided with suitable hardware and software for accepting time synchronization from a GPS using IRIG – B / ASCII time messages / 1 pps signals.

4.3 Any hardware required for multiplication of the ports of the GPS shall also be supplied by the Supplier.

4.4 The Central Billing Station software shall also be required to send signals to all the ABT energy meters connected to it for the purpose of time synchronization of these ABT energy meters.

5.0 INTERCONNECTIONS.

5.1 The Supplier shall be responsible for laying and termination of all cables at all locations as required under the project which includes interconnections among

Supplier supplied equipment and their interconnection with owner's panels/ meter location. Testing and commissioning of these interconnections shall also be done by the Supplier.

5.2 All power and control cables shall be as per RSDCL technical specifications. The signals cables for communication, I/O points shall be shielded type to provide suitable protection against noise and electromagnetic interference. All the cables shall be suitably sized to meet the functional requirements. Terminal Blocks / Wiring techniques, material and practices shall be as per RSDCL technical specifications.

6.0 ENVIRONMENTAL REQUIREMENTS.

The systems will be installed inside buildings without temperature or humidity control. The systems shall be capable of operating in ambient temperatures from 0 to +50 deg C with rate of temperature change of 20 deg C/hour and relative humidity up to 95% non-condensing at 40º C.

7.0 SIZE AND EXPANDABILITY.

The system shall contain at least 20% spare capacity. In addition to the above, the system shall have the capacity to add additional meters to expand the overall point count of the system by a minimum of 50% of the supplied capacity. Such additional capacity shall be connected and configured as and when required so that the data from these meters can be communicated / transmitted to the CS.

8.0 DOCUMENTATION.

8.1 The Bidder shall submit hardware and software documentation in three sets to Owner for review and approval. After approval, four sets of all the documents shall be submitted as final documentation. Any changes observed during field implementation shall be incorporated in the as-built drawing and the required sets of the same shall be submitted to the Owner.

8.2 The following minimum documents are envisaged for submission:

a) Detailed engineering drawing of system.
b) Details of database for all point counts.
c) Details of hardware to be supplied.
d) Details of software to be supplied.
e) Functional Design & Specification.
f) Hardware maintenance and operation manuals.
g) System FAT/SAT documents.

8.3 Further, the Bidder shall provide documents in soft copy as well CD media in two sets. 2 sets of CD/Floppy for system back up shall also be provided to restore the complete system including database in case of system crash due to unforeseen reasons.

9.0 AVAILABILITY REQUIREMENTS.

The system will perform data acquisition and transmit the data to the CS. Any failure of the system to perform its functions will adversely affect the availability of

data for the metering system. An availability of at least 95% is required excluding failure of power source. The failure of any system function and hardware shall be considered as non – availability of the system.

10.0 Guarantee Period of the system Equipments

All the items / equipments (Except ABT Meters) supplied / commissioned under this TN-04 shall be guaranteed for one year from the date of commissioning of complete system at all the locations. However, the guarantee period for ABT Meters shall be of 5 years from its successful commissioning in the system or five & half years from its supply at sites whichever is earlier. Any items / equipments supplied / commissioned or part thereof that may develop defects during performance guarantee period shall be promptly replaced by the supplier free of charge. If any defect is not remedied within a reasonable time, the purchaser may proceed to do the work at the Contractor's risk and expense, but without prejudice to any other rights which the purchaser may have against the Contractor in respect of such defects. The contractor shall also be responsible for up-gradation of software version as per requirement of metering system.

11.0 ANNUAL MAINTENANCE CONTRACT.

The Annual Maintenance Contract shall be for five years after expiry of Guarantee Period but it will be discretional on the part of RSDCL to place a separate order or otherwise. The Bidder shall quote rate for maintenance of the system for five year which shall not be considered for evaluation purpose.

12.0 ACTIVITIES.

To achieve the above mentioned objectives, RSDCL proposes to implement the complete solution in the manner of activities mentioned below.

(i) Installation & commissioning of ABT, 0.2S class meters & associated equipments/ items with features for replacement of meters without needing shutdowns for removing/ replacing meters, and networking the same at the substation with necessary communication components at substations and other designated locations mentioned in the specification.

(ii) Providing communication system for transferring data (Including Telemetering) from each meter connected in the system to the Central Billing Station (CBS), SLDC, Heerapura, Jaipur and designated locations mentioned/ covered in the specification.

(iii) Running the system including all operational activities and system maintenance for a period of 5 years, if desired by RSDCL.

(iv) Training of staff (Free of cost) before handing over a working system.

(v) If due to any reason data of any ABT Meter is not reached to the CBS, then it is the responsibility of the successful bidder to arrange manual reading with the help of Laptop or other means.

RAJASTNAN SOLAR PARK DEVELOPMENT COMPANY LTD
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TURNKEY PROJECT FOR

DESIGN, SUPPLY, ERECTION/ INSTALLATION AND COMMISSIONING OF ABT ENERGY METERS & ITS ASSOCIATED SYSTEM, ACQUISITION OF DATA AND ITS COMMUNICATION / TRANSMISSION TO THE DESIGNATED LOCATIONS.

Volume-II

(Part- III)

TECHNICAL SPECIFICATION

NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

OF

(ABT METERS)

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

TECHNICAL SPECIFICATION FOR 3 PHASE, 4 WIRE 0.2S CLASS AC STATIC INTER UTILITY TARIFF TRIVECTOR METER FOR EHV SYSTEM OF RSDCL SUITABLE FOR TARIFF METERING AS WELL FOR ENERGY ACCOUNTAL (ABT METERS)

1.0 SCOPE

1.1 This specification covers the design, engineering, manufacture,

1.2 It is not the intent to specify completely herein all the details of the design and construction of material. The material shall, however, conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser, who will interpret the meaning of drawings and specification and shall have the power to reject any work or material which in his judgement is not in accordance therewith. The offered materials shall be complete with all accessories, hardware, software and components necessary for their effective and trouble free operation. Such components shall be assembly inspection, testing at manufacturer's works before dispatch, supply and delivery at site / FOR destination in Rajasthan of class 0.2S accuracy static HT trivector tariff meters as per requirement given in this specification. The meters shall be used for commercial / tariff metering for bulk and inter utility power flows as well for T&D loss calculation.

1.3 The meter shall be installed on designated EHV substations as a self contained device for measurement of parameters in a programmable time clock initially set at 15 minute blocks. Meter shall also measure and display reactive energy (lag and lead) under voltage low (97%) and voltage high (103%) conditions as per tariff requirement. The meter shall also measure and display true cumulative energy import and export on daily and monthly basis.

1.4 Manufacturer should possess fully computerized meter test bench system for carrying out the relevant routine / acceptance tests as well facility to generate test reports for each and every meter tested.

1.5 The manufacturer should have duly calibrated Electronic Reference Standard (ERS) meter of accuracy class 0.02 or better.

1.6 The meter should be 3 phase 4 wire type suitable for connection to 3 phase 4 wire as well as 3 phase 3 wire system. The meter shall be capable of measuring in all the 4 quadrants. The meter should be capable of recording and displaying active, reactive and apparent energy and maximum demand for 3 phase 4 wire as well as 3 phase 3 wire AC balanced / unbalanced loads without affecting the accuracy for a power factor range of zero (lagging), unity and zero (leading) for export and import as per requirement given in this specification.

1.7 Meters shall be supplied alongwith related Basic Computer Software (BCS) as per details given in this specification. The meter shall have following features:

a) Modem interface connectable and compatible to GPRS system for transfer of data to remote stations. Any other system along with

associated equipments better than GPRS system may also be acceptable with prior approval of RSDCL.

b) For transfer of data, meter should have multiple communication ports for local reading and remote communication facility. It should support simultaneous communication over different ports.

c) Individual meter should drive operating power from VT/CVT supply. It should operate normally on VT/CVT supply and automatically switch over to DC auxiliary supply. The provision of auxiliary supply of 220 V DC/110V DC should be made in the meter. The voltage regulation in the auxiliary supply shall be within +/- 20%.

d) The meter should have facility for time synchronization with GPS clock or any other means for uniformity.

1.8 deemed to be within the scope of bidder's supply irrespective of whether those are specifically brought out in this specification and / or the commercial order or not.

2.0 STANDARDS APPLICABLE

2.1 Unless otherwise specified elsewhere in this specification, the performance and testing of the meters shall conform to the following Indian / International Standards and all related Indian / International standards to be read with up to date and latest amendments/ revisions thereof:

S. No.	Standard No.	Title
1	IS 14697- 1999 with latest amendment	AC static transformer operated Watthour and VAR – Hour meters, class 0.2S & 0.5S.
2	CBIP Publication No. 304	Manual on Standardization of AC Static Electricity Energy Meters. To be referred for tests for immunity against AC & DC magnetic induction of external origin as per revised values given at Clause 4.6.4, Table – 17, Influence Quantities.
3	IEC – 60687 – 2000 with latest amendment	AC static Watthour meters for active energy, class 0.2S & 0.5S.
4	IS – 9000 with latest amendment	Basic environmental testing procedures for electronic and electrical items.
5	IS 15959 – 2011	Indian Standard – Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification.

6	IEC – 61000 – 4 – 5 (2001 – 04) with latest amendment	For Electro-magnetic compatibility – Testing and measurement techniques, surge immunity test.
7	IS – 15707:2006	Specification for testing evaluation, installation and maintenance of AC Electricity Meters – Code of practice.

2.2 The meters shall bear BIS Certification mark.

2.3 Meters matching with requirements of other national or international standards which ensure equal or better performance than the standards mentioned above shall also be considered. When the equipment offered by the tenderer conforms to standards other than those specified above, salient points of difference between standards adopted and the standards specified in this specification shall be clearly brought out in the relevant schedule and copy of such standards alongwith their English translation shall invariably be furnished alongwith the offer.

3.0 CLIMATIC CONDITIONS: As given at clause No. 48.1 of GCC (Part-I, Volume-I)

4.0 PRINCIPAL PARAMETERS

4.1 Supply system:

Rated voltage (Vref) (Through PT)	3 x 110/$\sqrt{3}$ V, phase to neutral (3 phase 4 wire system) 3 x 110 V, phase to phase Meter shall be programmed for -/3x110 V (Phase – Phase) -/3x110/$\sqrt{3}$ V (Phase – Neutral)
Rated current (basic current, Ib) (Connected through CT)	3x -/1 Amps, or 3x-/5Amp as per requirement

Multiplying factor to arrive at actual primary values wherever applicable shall be calculated from the CT and PT ratio of the installed CTs and PTs.

5.0 GENERAL TECHNICAL REQUIREMENTS:

5.1 The micro processor based 3 phase 4 wire metering system shall conform to class 0.2S as per IS:14697-1999 and meter mounting shall be either projection type or Rack type as per specification and site requirement.

5.2 The active energy measurement (Wh) shall be carried out on 3 phase 4 wire principle with an accuracy as per class 0.2S of IS:14697-1999. In the meters, the energy shall be computed directly in CT/VT secondary quantities and indicated in Watthours. The meters shall compute the active energy (Wh) import and export from the sub station during each successive 15 minute block and store in its memory. It shall also display on demand the Wh import and export during the previous 15 minutes block.

5.3 Further, the meter shall continuously integrate and display on demand the accumulative active energy import and export from the sub station upto date & time. The cumulative Watt-hour reading at each midnight shall be stored in the meter memory. Separate register shall be maintained for active energy import and export.

5.4 The meter shall count the number of cycles in VT/CVT output during each successive 15 minute block and divide the same by 900 to arrive at the average frequency. This shall be available in the report generated as a two digit code, which shall be arrived at by subtracting 49 from the average frequency, multiplying by 50 and neglecting all decimals. For example 49.89 Hz. shall be recorded as 44. In case the average frequency is less than 49 Hz. it shall be recorded as 00. In case it is 51.0 Hz. or higher it shall be recorded as 99. The average frequency of the previous 15 minute block shall also be displayed on demand in Hertz.

5.5 The meter shall continuously compute the average of the RMS value (fundamental only) of the 3 phases to neutral VT/CVT secondary voltage and then display the same on demand.

5.6 The meter shall also compute the reactive power (VAr) on 3 phase 4 wire principle and integrate the reactive energy (VArh) algebraically in two separate registers, one for the period for which RMS voltage is 103% or higher and the other for the period for which the RMS voltage is below 97%. Limits of error shall conform to IS 14697 for class 0.5S. The current reactive power (VAr), with a minus sign if negative, and cumulative reactive energy (VArh) reading of the two registers shall be displayed on demand. The readings of the two registers at each midnight shall also be stored in the meter's memory. In the meter, the reactive power and reactive energy transmittals shall be computed in VAr / VArh directly calculated in VT/CVT and CT secondary quantities. When lagging reactive power is being sent out from the Sub Station, VAr display shall have no sign and VArh registers shall move forward. When reactive power flow is in the reverse direction, VAr display shall have a negative sign and VArh registers shall move backwards.

5.7 Four cumulative energy registers for reactive energy should be available on meter display.

a) Reactive energy lag while active energy import.
b) Reactive energy lag while active energy export.
c) Reactive energy lead while active energy import.
d) Reactive energy lead while active energy export.

5.8 Each meter shall have a built in calendar in clock. The maximum drift permissible in the real time clock shall be +/- 2 minutes / year for 0.2 S class meters. The calendar and clock shall be correctly set at the manufacturer's works. The date (day – month – year) and time (hour – minute – seconds) shall be displayed on the meter front on demand. Clock adjustment shall be possible remotely using time synchronization signal through modem and or GPRS system. For the purpose of getting standard time, the computer from where the meter will be read shall be equipped with GPS signal receiver.

5.9 Each meter shall have a unique identification code, which shall be marked permanently on the front as well as in its memory.

5.10 Each meter shall have a non volatile memory in which the following shall be automatically stored. The non volatile memory should retain data for a period not less than 10 years under un-powered condition. Battery back up memory will not be treated as NVM and shall not be accepted.

5.10.1 Average frequency for each successive 15 minutes block upto second decimal.

5.10.2 Wh transmittal during each successive 15 minutes block upto second decimal for import and export separately.

5.10.3 Cumulative Wh transmittal at each mid night.

5.10.4 Cumulative VArh transmittal for voltage high condition at each mid night.

5.10.5 Cumulative VArh transmittal for voltage low condition at each mid night.

5.10.6 Failure of VT supply on any one phase as a star (*) mark in load survey data.

5.11 The meters shall store all the above listed data in their memories for a period of 22 days. The data older than 22 days shall get erased automatically.

5.12 It shall be possible to obtain data from the meter in the following form.

Date: Time	Frequency	Wh. (import)	Wh (Export)	Wh (Net)
00: 15		12.22	25.22	-13.00
00:30		13.91	23.91	-10.00
-				
-				
-				
24:00		37.23	27.23	+ 10.00

5.13 All meters shall be totally identical in all respects except for their unique identification codes. They shall also be totally sealed with no possibility of any adjustment at site except for clock correction.

5.14 The meters shall safely withstand the usual fluctuation arising during faults, in particular ,115% of rated VT/CVT secondary voltage applied continuously and 190% of rated secondary voltage for 3 seconds, and 120 % of rated CT secondary current applied continuously and 20 times of maximum current applied for 0.5 seconds, shall not cause any damage to or the maloperation of the meters.

5.15 Individual meter should drive operating power from VT/CVT supply. It should operate normally on VT/CVT supply and automatically switch over to DC auxiliary supply when VT / CVT supply fails. The provision of auxiliary supply of 220 V DC/110V DC should be made in the meter. The voltage regulation in the auxiliary supply shall be within +/- 20%.

5.16 An automatic back up for the continued operation of the offered meters clock and calendar shall be provided through a long life battery which shall be capable of supplying the required power for atleast two years under meter un-powered conditions. The offered meters shall be supplied duly fitted with the battery that shall not be required to be changed for at least 10 years, as long as total VT interruption does not exceed two years.

5.17 Power Factor Range:

The meter shall be suitable for full power factor range from zero (lagging) through unity to zero (leading). The meter should work as an active energy import and export and reactive (lag and lead) energy meter.

5.18 Power Supply Variation

The meter should be suitable for working with following supply variations:

Specified operating range	-	0.8 to 1.1 Vref.
Limit range of operation	-	0.7 to 1.2 Vref
Frequency	-	50 Hz ± 5 %.

5.19 Accuracy

Class of accuracy of the meter shall be 0.2S for active energy & 0.5S for reactive energy. The accuracy should not drift with time. The measurement of accuracy of the parameters shall be as under:

Parameter		Accuracy class of meter
		0.2S
Wh	-	0.2
VArh	-	0.5

5.20 Power Consumption

i) Voltage Circuit: The active and apparent power consumption in each voltage circuit including the power supply of meter at reference voltage, reference temperature and reference frequency shall not exceed 1.5 Watt per phase and 10 VA per phase respectively.
ii) Current Circuit: The apparent power taken by each current circuit at basic current, reference frequency and reference temperature shall not exceed 1 VA per phase.

5.21 Starting Current

The meter should start registering the energy at 0.1% Ib at unity power factor.

5.22 Maximum Current

The rated maximum current of the meter shall be 120% Ib.

6.0 GENERAL AND CONSTRUCTIONAL REQUIREMENTS

6.1 Meters shall be designed and constructed in such a way so as to avoid causing any danger during use and under normal conditions. However, the following should be ensured:

a) Personnel safety against electric shock
b) Personnel safety against effects of excessive temperature.
c) Protection against heat & spread of fire.
d) Protection against penetration of solid objects, dust and water.
e) Protection against radio interference.
f) Protection against electro-magnetic & electro-static fields.
g) Protection against shock & vibration.
h) Protection against fraud.
i) Prevention against pilferage.

6.2 All the material and electronic power components used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy.

6.3 The meter shall be designed with application specific non-editable integrated circuits/microprocessors. The electronic components shall be mounted on the printed circuit board using latest technology.

6.4 All insulating materials used in the construction of meters shall be non-hygroscopic non-ageing and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.

6.5 The meter mounting shall be either projection type or rack type as per specification and site requirement.

6.6 Each meter shall have a test output device (visual) for checking the accuracy of active energy (Wh) and reactive energy (VArh) measurement using a suitable test equipment. The test output shall not be software configurable. It should be possible to select the output for active energy import / export and reactive energy lag / lead by operation of the push button(s)/ keypad provided on the meter for scrolling through the menu / display.

6.7 The meter shall have an operation indication device such as a blinking LED/LCD. The operation indicator shall be visible from the front window. Separate indicators shall preferably be provided for Wh & VArh pulse indication. In case only one indicator is provided, it should be possible to select Wh or VArh pulse with the use of push buttons/ keypad/ menu selection provided on the meter (access through software should not be required).

6.8 The meter shall be suitable for being connected through test terminal blocks to the voltage transformer having a rated secondary line to neutral voltage of $110/\sqrt{3}$ V and to current transformers having a rated secondary current of 1A or 5A as per requirement. Any further transformers / transducers required for their functioning shall be in-built in the meters. Necessary isolation and / or suppression shall also be built-in for protecting the meters from surges and voltage spikes that may occur in the VT/CVT/CT circuits of the EHV switchyards.

6.9 A keypad / Push buttons(s) shall be provided on the front of the main control module for switching on the display of the metering module / parameters selected and for changing from one indication to the next. Menu driven or other forms of display can also be accepted provided they meet RSDCL requirements. Such arrangements shall be demonstrated and got approved from RSDCL, during technical bid evaluation.

6.10 The meter shall have communication facilities as per IS 15959 – 2011: Indian Standard – Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification.

a) It shall also be possible to retrieve on line data through RS485, PCP/IP port simultaneously through either USB Port or optical port.

b) The meter shall be provided with the following ports:

i) RS 485 port for periodic data transfer to Sub Station data logger / Computer. RS 485 communication port shall be suitable for

interfacing multiple Energy Meters. It shall be possible to download stored meter data on polling basis with the aid of a software schedule by addressing one meter at a time and downloading the stored data into the Sub Station data logger / Computer / Data Acquisition Server.

ii) Network port (TCP / IP based) for periodic transfer through communication medium GPRS to CS, Heerapura.

iii) Galvanically isolated optical communication port in front of the meter for data transfer to or from Laptop**.**

iv) A USB port which will be an integral part of meter and available at front side of meter covered suitably for sealing purpose. This USB port shall support Laptop for reading the meter data as an alternate media for CMRI meter reading

c) It should support simultaneous communication over different ports.

6.11 The 15 minute block wise data (energy, anomaly, average parameters, etc.) in the meter shall be required to be communicated to central station, Heerapura. The communication with the meter shall be as described at 6.10 above. The meter shall be capable of such communication.

6.12 Each meter shall have an optical galvanically isolated communication port and USB port compatible to RS 232 on its front for tapping all data stored in its memory. The communication protocol should be open as per DLMS, IS 15959-2011. Laptop shall be used for this purpose as per requirement to serve as interface between the meters specified above and data acquisition server. The overall intention is to tap the data stored in the meter memory ON LINE using the modem and a remote central computer through GPRS system and the Laptop as a back up in case of break down of the communication system. It shall also be possible to obtain a print out (hard copy) of all data collected from the meters using the PC. Remote meter reading software shall be supplied by the bidder.

6.13 The meter shall conform to the degree of protection IP 51 of IEC 60687 for protection against ingress of dust, moisture and vermin.

6.14 The meter-base, meter-cover, terminal block shall be made of unbreakable, high grade, fire-resistant, reinforced, non-inflammable, high grade and good quality engineering plastic/suitable material to ensure safety. The manufacturer shall clearly indicate the material used.

6.15 The meter cover shall have one window. The window shall be of transparent, UV stabilized polycarbonate or equivalent high grade engineering plastic for easily reading all the displayed values/parameters, name plate details and observation of operation indicator. The window shall be ultrasonically welded with the meter cover such that it cannot be removed undamaged without breaking the meter cover seals.

6.16 The terminal block shall be of high grade non hygroscopic, fire retardant, low tracking, fire-resistant, high grade engineering plastic (not bakelite) which should form an extension of the meter case, meeting the

requirement of clause No.6.4 of IS 14697/ Clause No. 4.2.4 of IEC 1036-1996.

The current circuit conductors of a meter shall be connected to its current terminals inside the meter terminal block adopting any of the recommended methods given in clause 6.4 – Annexure B of IS-13779 – 1999.

6.17 The manner of fixing the conductors to the terminal block shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixings which may be loosened and tightened several times during the life of the meter shall screw into a metal nut. All parts of each terminal shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Two screws shall be provided in each current terminal for effectively clamping the external leads of thimbles. Each screw shall engage at least 3 threads in the terminal. The ends of screws shall be such as not to pierce the conductor. Electrical connections shall be so designed that contact pressure is not transmitted through insulating material. The internal diameter of the terminal holes shall be 5.5 mm. The clearances and creepage distances shall conform to clause 6.6 of IS 14697 -1999. Minimum center to center clearance between adjacent connections shall be 13.5 mm. Alternate equivalent manners of fixing/ connecting conductors/ wires to the meter may be proposed but shall have to be demonstrated during pre-bid evaluation for acceptance by RSDCL.

6.18 In case of the terminal block and the meter case, reasonable safety shall be ensured against the spread of fire. The material should not be ignited by thermic overload of live parts in contact with them.

6.19 The meter shall be compact in design. The entire design and construction shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation. The meter shall be convenient to transport and immune to shock and vibrations during transportation and handling.

6.20 SEALING OF THE METER:

a) Reliable sealing arrangement should be provided to make the meter tamper - proof and to avoid tampering by unauthorized persons.
b) The body / cover of the meters shall be sealed by the manufacturer at his works. In addition, one more body / cover sealing point shall be provided for sealing the meters after installation.
c) Two Nos. sealing points shall be provided for sealing the meter terminal cover.
d) One sealing point shall also be provided for each communication port.
e) One sealing point shall also be provided for the MD reset button (if such button is provided).
f) A tracking and recording software for all new seals shall be provided by the manufacturer of the meters so as to track total movement of

seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal.

g) Only the patented seals (seal from the manufacturer who has official right to manufacture the seal) shall be used.
h) Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seal shall be used. Lead seals shall not be used in the meters.
i) Rear side sealing arrangement will not be preferred, unless specifically agreed to.
j) The sealing arrangement should be explained by the suppliers in their offer.

6.21 MARKING OF METER :

The meter terminal marking and mounting arrangement should be as per Indian installation practices. The marking on every meter shall be in accordance with IS 14697-1999 / IEC 60687-2000.
Every meter shall have name plate beneath the meter cover such that the name plate cannot be accessed without opening the meter cover and without breaking the seals of the meter cover. The name plate shall be marked indelibly. The name plate marking should not fade or otherwise be adversely affected by UV exposure with lapse of time. The basic markings on the meter name plate shall be as follows:-

i. Manufacturer's name and trade mark.
ii. Type designation.
iii. Number of phases and wires.
iv. Serial Number.
v. Month and year of manufacture.
vi. Reference voltage and PT ratio.
vii. Rated secondary current of CT (-/1 A) or (-/5 A) as per requirement**.**
viii. Principal unit(s) of measurement.
ix. Meter constant (Imp/kWh, Imp/kVArh).
x. Class index of meter.
xi. "Property of RSDCL".
xii. RSDCL's purchase order number and date.
xiii. Guarantee period.
xiv. BIS Certification Mark.
xv. ABT Meter.

6.22 Connection Diagram And Terminal Markings :

The connection diagram of the meter for 3 phase 4 wire system as well as 3 phase 3 wire system shall be clearly shown on meter body. The meter terminals shall also be marked and this marking should appear in the above diagram.

6.23 SOFTWARE:

5 Numbers/sets of licensed copies of the following software shall be supplied in addition to those installed on Laptop by the supplier without extra cost. The supplier shall impart necessary training regarding installation and use of the above software.

a) Software for reading, down loading data, time setting in the meter to be installed in the Laptop being purchased separately under this TN.

The software shall be suitable for Windows or higher version. The software shall be installed in the Laptop as well as supplied separately in the form of CDs. Software should be suitable and configurable to other kinds of tariff within the recorded parameters / data provided by the meter.

ABT programming should be enabled at Laptop and Basic Computer System under multi level password protected security system for specified meter(s).

b) Windows based Basic Computer Software (BCS) for receiving data from Laptop and from meter directly through USB port and optical port or other specified communication system and downloading/programming instructions to Laptop. This BCS should have, amongst other requirements and features and facilities described in detail in the specifications for Laptop, the facility to convert meter reading data into user definable ASCII format so that it may be possible for the user to integrate the same with the user's billing data and process the selected data on line in desired manner. The necessary training if required, and documentation for this purpose shall also be provided free of charge.

c) Necessary software for loading application program via Laptop serial port shall be made available separately**.**

d) Any other special application software of the manufacture for the meter.

Any future upgradation made by the bidder in any of the above software shall also be provided free of cost.

7.0 SALIENT FEATURES:

The meter shall have the following additional salient features:

7.1 The 3 line to neutral voltages shall be continuously monitored by individual phase wise LEDs or by any other indications. In case any of these voltages falls below 60%, the normally flashing / steady lamp / indication provided on the meters front becomes steady/off. The time blocks in which such a voltage failure occurs/ persists shall also be recorded in the meter’s memory. The indication shall automatically resume normal function when corresponding VT secondary voltage is

healthy again. The two VArh registers specified in clause 5.6 shall remain stay put while VT supply is unhealthy.

7.2 Individual meter should drive operating power from VT/CVT supply. It should operate normally on VT/CVT supply and shall automatically switch over to DC auxiliary supply when VT supply fails. The provision of auxiliary supply of 220 V DC/110V DC should be made available in the meter. The voltage regulation in the auxiliary supply shall be within +/- 20%.

7.3 The meters should be provided with pulse output coincident with end of its demand period.

7.4 The meter should have LCD multiple display with backlit/LED and should have page wise display of multiple parameters with option of configuration favorite parameters under the favorite page.

7.5 It should be possible to check the healthiness of phase voltages by displaying all the voltages on the meter display.

7.6 The meter should work accurately irrespective of phase sequence of the mains supply.

7.7 It should be possible to check the correctness of connections of CT/VT/CVT to the meter with proper polarity. This feature may be made available on the meter display or on Laptop. For this purpose, suitable software for field diagnosis of meter connections with the help of meter and Laptop should be supplied as per Annexure – G – 15 of IS 14697-1999.

7.8 The meter should continue to record accurately as per prevailing electrical conditions even if the neutral of potential supply gets disconnected.

7.9 The meter shall be provided with adequate magnetic shielding so that any external magnetic field (AC electro magnet or DC magnet) as per the values specified in CBIP Publication No. 304 (with latest amendments) applied on the meter shall not affect the proper functioning and recording of energy as per error limits prescribed by CBIP.

7.10 It shall not be possible to change the basic meter software by any means in the field. Moreover, critical events like time set, MD reset operation and tariff change shall be logged by the meter. Such events shall be logged in roll over mode for minimum ten events.

7.11 Display Of Measured Values:

a) The measured value(s) shall be displayed through Liquid Crystal Display (LCD backlit) or Light Emission Diode (LED) display.

b) The data should be stored in Non Volatile Memory. The non volatile memory should retain data for a period of not less than 10 years under un-powered condition. Battery backup memory will not be considered as NVM.

c) It should be possible to easily identify the single or multiple displayed parameters through symbols / legend on the meter display itself or through display annunciator. A separate legend plate indicating the symbols shall be supplied by manufacturer along with each meter.

d) The register shall be able to record and display, starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor for CT ratio up to 1000/1A for 1 Amp meters and for PT ratio up to 400 KV/110 V. The register should not roll over in between this duration.

e) Any interrogation/read operation shall not delete or alter any stored meter data. The meter should continue to read & store data even during simultaneous interrogation/read operation through Laptop/online and should not stop working on this account.

7.12 Meter Serial Number:

In addition to providing serial number of the meter on the display plate, the meter serial number shall also be programmed into meter memory for identification through Laptop meter reading print out and optionally on meter display.

7.13 Display Sequence:

The meter shall display the required parameters on suitable selection through key pad or push button(s) or menu selection.

a) LED / LCD segment check.
b) Real time – Hour, Minutes, Seconds.
c) Date – dd, mm, yy.
d) Meter serial number.
e) Power On hours.
f) Cumulative MD reset count.
g) Active energy import (Wh on 15 minutes block basis for previous block)
h) Active energy export (Wh on 15 minutes block basis for previous block)
i) Average frequency of previous block in Hz.
j) Average voltage.
k) Cumulative Reactive energy for voltage high condition.
(i.e., net VArh when RMS voltage is ≥ 103% Vn).
l) Cumulative Reactive energy for voltage low condition.
(i.e., net VArh when RMS voltage is < 97%).
m) Energy registers of active, reactive and apparent energies for True import / export cumulative readings :

i) Cumulative Active energy import (Wh).
ii) Cumulative Active energy export (Wh).
iii) Cumulative Reactive energy lag (VArh lag) while Wh import.
iv) Cumulative Reactive energy lag (VArh lag) while Wh export.
v) Cumulative Reactive energy lead (VArh lead) while Wh import.
vi) Cumulative Reactive energy lead (VArh lead) while Wh export.
vii) Cumulative Apparent energy (VAh) while Wh import.
viii) Cumulative Apparent energy (VAh) while Wh export

ix) High resolution energy registers (Minimum 4 digits after decimal).

i) Wh - **.****
ii) VArh lag - **.****
iii) VArh lead - **.****
iv) Vah - **.****

Note: If energy readings upto 4 decimal or more digits are provided on the main registers, then high resolution energy registers as given at sequence (m (ix)) will not be required separately. Alternatively, the same can be given on the CMRI.

n) Instantaneous power factor with sign for lag / lead.
o) Cumulative maximum demand (VA)
p) Instantaneous phase voltage.
   i) R phase voltage
   ii) Y phase voltage
   iii) B phase voltage
q) Instantaneous line currents (Amps.)
   i) R phase line current
   ii) Y phase line current.
   iii) B phase line current
r) Frequency
s) Phase sequence of voltages.
t) Detailed phase wise anomaly information should, however, be logged in the meter memory and be available for downloading to the BCS directly.
u) VArh import during the block when voltage was less than 97% of nominal voltage.
v) VArh export during the block when voltage was more than 103% of nominal voltage.
w) Instantaneous load in
   i) W
   i) VA
   ii) VAR
x) Maximum demand in VA / W since last reset.
y) Anomaly data:
   i) Present status of anomaly:

      a) Missing potential with phase identification
      b) CT polarity reversal with phase identification
      c) Current unbalance.

   ii) Date and time of last anomaly occurrence with type of anomaly.
   iii) Date and time of last anomaly restoration with type of anomaly.
   iv) Cumulative anomaly count of all types of anomalies and all phases.

   Detailed phase wise anomaly information should, however, be logged in the meter memory and be capable of down loading through the BASIC COMPUTER SOFTWARE.

7.14 Output Device:

The meter shall have a test output accessible from the front and be capable of being monitored with suitable testing equipment. The operation indicator, if fitted, must be visible from the front. Test output device shall be provided in the form of one common LED / LCD for Wh & VARh with the provision of selecting the parameter being tested by the use of the keypad / push button(s)/ menu selection. Alternatively, test output device in the form of separate LEDs / LCDs for Wh & VARh is also acceptable.

The relation between test output and the indication on display shall comply with the marking on the name plate (impulse per Wh/VArh).

The manufacturer shall state the necessary number of pulse count(s) to ensure measurement accuracy of at least $1/10^{th}$ of class of the meter at the different test points.

The resolution of the test output pulse(s) should be sufficient to enable conduction of the starting current test in less than 10 minutes and accuracy test at the lowest load with desired accuracy within 5 minutes.

7.15 Time Synchronization:

The time synchronization should be possible from remote through communication port(s) of the meter using time synchronization signal received from GPS through GPRS system and or modem.

7.16 Maximum Demand (MD) registration:

The meter shall continuously monitor and calculate the average demand in VA/ W during the integration period set, and the maximum out of these shall be stored in the meter memory along with date and time when it occurred. The maximum registered value shall also be made available on meter display.

The integration period shall be set as 15 minutes on real time basis which shall be capable of being changed to other integration period also, if required.

The principal of maximum demand calculation used by the bidder should be explained in the offer.

A pulse output coincident with end of each demand period shall be provided in the meter.

7.17 Maximum demand reset:

Facility for auto reset of MD at predefined date and time shall be provided. The meter shall display the maximum demand reset count.

7.18 Load survey capability and billing point requirements:

The meter shall be capable of recording following data for 15 minutes integration period for at least last 22 days.

a) Wh Import.
b) Wh Export.
c) VArh Lag when Wh is Import.
d) VArh Lag when Wh is Export.
e) VArh Lead when Wh is Import.
f) VArh Lead when Wh is Export.
g) VAh when Wh is Import.
h) VAh when Wh is Export.
i) VArh Import when voltage was less than 97%.
j) VArh Export when voltage was more than 103 %.

The meter shall also be capable of recording the 15 minute average values of the following data for at least last 22 days.

i) W Import.
ii) W Export.
iii) VA Import.
iv) VA Export.
v) All the three phase voltages i.e. RN, YN and BN.
vi) All the three phase currents i.e. R, Y & B.
vii) Power Factor.
viii) Frequency

It shall be possible to select either demand or energy view in the Basic Computer Software.

The average frequency should be logged with a marking of time advance / retard and voltage low event if occurred in that integration period. Voltage low marking should be locked when average voltage goes below 60% of Vref.

The load survey data should be available in the form of bar charts as well as in spread sheets. The Basic Computer Software shall have the facility to give the complete load survey data both in numeric and graphic forms.

The figures of 24 hourly Wh import, Wh export and VAh import, VAh export should also be made available under each date in the load survey or otherwise, it should be possible to calculate such figures through Basic Computer Software.

The predefined date and time for registering the billing parameters of Wh import, Wh export, VAh import, VAh export, PF import, PF export and VA MD import, VA MD export shall be 00.00 hours of the first day of each calendar (billing) month. All billing parameters shall be transferred to billing registers and shall be displayed on display mode referred to as 'BILLING PARAMETERS'.

The above billing data, load survey data, anomaly information and instantaneous parameters data shall all be retrievable as stored in the preset cyclic order through the meter's communication ports through a Laptop and

the other communication ports. It shall be possible to transfer (down load) this data to a PC with windows based software to get complete details in numerical and graphic forms. The necessary Basic Computer Software (BCS) for this purpose shall be provided by the bidder with complete details. The 15 minute data required for on line transmission to the CS, Heerapura through the communication ports shall be as given at clause 7.26. However, the software/tool required for obtaining the information through the communication ports of the meter as above shall be supplied by the manufacturer.

Further, apart from instantaneous parameters like voltage, current, PF and readings of billing parameters, energy registers, etc., the following additional parameters should be made available at the Basic Computer Software :

a) Meter programming count.

b) MD reset count.

c) Billing parameters for last three months.

7.19 Harmonics measurements:

The meter should be capable of measuring fundamental energy as well total energy, i.e., fundamental plus harmonics energy. Fundamental energy should be made available on meter display and the same shall be used for billing purpose.

The supplier shall indicate the sampling rate so that it shall be sufficient for the user to determine the accuracy of total energy.

The values of total energy shall be made available either on meter display or on BCS with proper resolution.

The supplier shall state as to how he will meet the above requirement and finally the above requirement shall be mutually agreed between user and supplier.

The total energy (fundamental plus harmonic energy) shall be logged in the meter memory and be capable of down loading to the BCS directly.

7.20 Self Diagnostic Feature:

The meter shall be capable of performing complete self diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data memory location all the time.

The meter shall have indications for unsatisfactory / non–functioning / malfunctioning of the following as per the requirement under G 19 of IS 14697:

a) Time and date, and
b) All display segments.

The meter shall have indications for unsatisfactory / non – functioning of the following as per clause 6.10 of the CBIP Publication No. 304.

a) Time and Calendar
b) Real Time Clock

c) RTC Battery
d) Non – Volatile Battery

The details of malfunctioning of time and date should be recorded in the meter memory. The details of self diagnostic capability feature should be furnished by the bidder.

7.21 Tamper and Anomaly detection features:

The meter should have features to detect the occurrence and restoration of at least the following common ways of tamper/anomaly:

a) Missing potential: The meter shall be capable of detecting and recording occurrences and restoration of missing potential (1 phase or 2 phases) which can happen due to intentional / accidental disconnection of potential leads, along with the total number of such occurrences for all phases. Absence of one or more phase voltage from mains side should not be recorded as missing potential.
b) CT polarity reversal: The meter shall be capable of detecting and recording occurrences and restoration of CT polarity reversal of one or more phases.
c) CT Short (Bypass) / Open: The meter shall be capable of detecting and recording occurrences and restoration of shorting (bypassing) / opening of any one or two phases of CT when the meter is connected to a 3 phase 4 wire system. This feature shall not be available if and when the meter is connected to a 3 phase 3 wire system.
d) Current and voltage unbalance: The meter shall be capable of detecting and recording occurrences and restoration of current and voltage unbalance separately as an anomaly event.
Snap shots (numerical values) of voltage, current, power factor and energy (Wh/kWh) readings as well as the date and time of logging of the occurrence and restoration of all anomaly events, subject to meter memory space as described herein under, should be logged in the meter memory and available for retrieving through the meter's optical port/USB port to the Basic Computer Software.
e) Power On/Off: If all the voltages are not available, power OFF event should be logged, and power ON event should be logged when supply is available. The power ON and OFF event should be logged with date and time.

Minimum hundred (100) events (occurrence and restoration) of all types of anomaly with date and time shall be available in the meter memory on first-in, first-out basis. It shall be possible to retrieve the anomaly data along with all related snap shots data through the meter's optical port with the help of communication system available and down load the same to the Basic Computer Software where it shall be available for viewing. All this information shall be available in simple and easily understandable format.

7.22 Anomaly detection logic:

A properly designed meter anomaly logic should be provided. The anomaly logic should be capable of discriminating the system abnormalities from source side and load side and it should not log / record anomaly due to source side abnormalities.

The threshold values and logic for voltage, current and PF, etc. for the purpose of logging occurrence and restoration of various types of anomalies are given below at clause 7.23. The bidder may, however, propose other logics/ values in their offer based on their experience.

7.23

S.No.	Tamper event with date and time	Occurrence	Restoration
1	Missing Potential :		
a)	Voltage	<20% Vref	>40% Vref
b)	Line current	>10 % Ib	Ignored
c)	Persistence Time	5 Min.	120 Seconds
Notes : 1)	Missing potential should be phase wise.		
2)	Absence of one or more phase voltages from supply side should not be recorded as missing potential.		
2.	CT Polarity Reversal : (Phase wise)		
a)	Line current in tampered phase	>5% Ib(Current direction negative)	Current direction becomes positive
b)	Power Factor	>0.2	Not applicable
c)	Persistence Time	5 Min.	120 Seconds
Notes : 1)	Current reversal detection will be phase wise.		
3	Current Short / Bypass:		
a)	Vector sum of line currents	$(I_R + I_Y + I_B) >$ 20% Ib	$(I_R + I_Y + I_B) <$ 5% Ib
b)	Persistence Time	5 Min.	120 Seconds
Notes : 1)	Current Short / Bypass detection shall be phase wise.		
4	Current Unbalance:		
a)	Max. Current – Min. Current	> 5% Ib	<1% Ib
b)	Persistence Time	5 Min.	120 Sec.
5	Voltage Unbalance		
a)	{(Max. Voltage-Min. Voltage) x 100}/Avg. Voltage	> 5% Vref.	<1% Vref.

S.No.	Tamper event with date and time	Occurrence	Restoration
b)	Persistence Time	5 Min.	120 Sec.
Note: Any temper event will be logged only when the meter senses all respective threshold conditions.			

7.24 There shall be four separate compartments for logging of different type of anomalies as follows:

Compartment No.1 :
25% of total anomaly memory space shall be allocated for the following current related anomalies:

- CT polarity reversal
- CT open circuit
- CT short (by pass)

Compartment No.2:
25% of total anomaly memory space shall be allocated for missing potential and voltage unbalance anomalies.

Compartment No.3 :
50% of total anomaly memory space shall be allocated for current unbalance anomalies.

Compartment No.4 :
Twenty (20) events of power ON / OFF.

The logging of various anomalies in each compartment should be as under:

Once one or more compartments have become full, the last anomaly event pertaining to the same compartment will be entered and the earliest (first one) anomaly event should disappear. Thus, in this manner each succeeding anomaly event will replace the earliest recorded event, compartment wise. Events of one compartment/category should overwrite the events of their own compartment/ category only.

Bidders may indicate alternate proposals for the above anomaly detection and logging scheme.

Anomaly count should increase as per occurrence (not restoration) of anomaly events. The total number of anomaly counts should also be provided on the meter display as well as at the Basic Computer Software end.

7.25 Anomaly Persistence Time:

The persistence time for logging/registration of an occurrence of an anomaly should be 5 minutes ±10 seconds. The persistence time for logging of restoration of anomaly should not be more than 120 seconds.

7.26 Transmission of Data:

The following parameters (15 minutes block time) are required to be transmitted from the ABT meters to the CS.

Load Survey Parameters :- The parameters listed below in this Table are for load survey purpose and are logged as per the block period time i.e 15 minutes for which the data storage will be 22 days.

S.No.	Parameters
1	Real time clock, date and time.
Average Value of 15 minutes block period.	
1	Frequency
2	Voltage V_{RN}
3	Voltage V_{YN}
4	Voltage V_{BN}
Actual Energy consumption during 15 minutes Time Block	
1	Energy – Active Import
2	Energy – Net active energy
3	Energy - Active Export
4	Energy kVarh, Quadrant -I
5	Energy kVarh, Quadrant -II
6	Energy kVarh, Quadrant -III
7	Energy kVarh, Quadrant -IV

Daily Load Profile

Parameter :- The parameters listed below in the Table are meant for billing purpose and shall be logged at mid night (00.00 Hours). The storage time for these parameters is 22 days.

S.No.	Parameters
1	Real time clock, date and time.
2	Cumulative energy, kWh (Import)
3	Cumulative energy, kWh (Export)
4	Cumulative energy, kVAh while kW import

5	Cumulative energy, kVAh while kW Export
6	Reactive energy high (V > 103 percent)
7	Reactive energy low (V < 97 percent)
8	Cumulative energy, kVarh, Quadrant-I
9	Cumulative energy, kVarh, Quadrant-II
10	Cumulative energy, kVarh, Quadrant-III
11	Cumulative energy, kVarh, Quadrant-IV

The following parameters shall also be available for transmission through the communication ports indicated at clause 6.10.

a) Instantaneous Parameters:

i)	Real Time Clock – Date and Time	ii)	Current – IR
iii)	Current - IY	iv)	Current – IB
v)	Voltage – VRN	vi)	Voltage – VYN
vii)	Voltage – VBN	viii)	Voltage – VRY
ix)	Voltage – VBY	x)	Signed Power Factor – R Phase
xi)	Signed Power Factor – Y Phase	xii)	Signed Power Factor – B Phase
xiii)	Three Phase Power Factor – PF	xiv)	Frequency
xv)	Apparent Power – kVA	xvi)	Signed Active Power – kW (+ Import; – Export)
xvii)	Signed Reactive Power – kVAr (+ Lag; – Lead)	xviii)	Cumulative Energy – kWh (Import)
xix)	Cumulative Energy – kWh (Export)	xx)	Cumulative Energy – kVAh (Import)
xxi)	Cumulative Energy – kVAh (Export)	xxii)	Number of Power Failures
xxiii)	Cumulative Power Failure Duration	xxiv)	Cumulative Tamper Count
xxv)	Cumulative Billing Count	xxvi)	Cumulative Programming Count
xxvii)	Billing Date		

7.27 Accuracy Requirement:

The accuracy of parameters measured by meters shall be tested in accordance with the relevant standards described in clause 2.0 of this specification. For apparent energy, accuracy testing shall be done in accordance with the provisions of annexure G 7 of IS 14697-1999. Time accuracy of the meter should be as per annexure G 18 of IS-14697-1999.

7.28 Electrical Requirement:

The electrical requirement of meter shall be as specified in the relevant standards described in clause 2.0 of this specification.

7.29 Electro Magnetic Compatibility And Interference Requirements:

The meter shall meet EMI / EMC requirements as specified in the relevant standards described in clause 2.0 of this specification.

7.30 Mechanical Requirement:

The meter shall meet the mechanical requirements as specified in the relevant standards described in clause 2.0 of this specification.

7.31 Climatic Influence Requirement:

The meter shall meet dry heat / cold / damp heat cyclic test requirements as per the relevant standards described in clause 2.0 of this specification.

8.0 **LIFE EXPECTANCY:**

The meter shall be designed to meet the life expectancy of 20 years.

9.0 **TESTS FOR THE METER:**

9.01 TYPE TESTS

The energy meters offered shall be fully type tested at NABL accredited Test Laboratories as per relevant standards described in clause No. 2.0 of the specification. The bidder must furnish two sets of type test reports in respect of AC static HT trivector meter of 0.2S accuracy class of both current ratings alongwith the bid. These type tests must not have been conducted earlier than seven years from the date of opening of bid. Bids without type test reports will be treated as non responsive.

9.02 Names of Competent Laboratories as given in the CBIP Publication no. 304 (National Physical Laboratory or Laboratory accredited by NABL, India for the particular testing) where type tests can be conducted are listed below:

No.	Short Name	Full Name of Testing Laboratories
1	NPL	National Physical Laboratory, New Delhi
2	CPRI (Bangalore)	Central Power Research Institute, Bangalore
3	CPRI (Bhopal)	Central Power Research Institute, Bhopal
4	ERTL (N)	Electronics Regional Test Laboratory (North), New Delhi
5	ERTL (E)	Electronics Regional Test Laboratory (East), Kolkata
6	ERDA	Electronics Research &Development Association,

		Vadodara
7	ETDC (Chennai)	Electronics Test & Development Centre, Chennai
8	YMPL	Yadav Measurements Private Ltd., Udaipur
9	SML	Secure Meters Ltd., Udaipur
10	Torrent Power	Torrent Power Ltd., Ahmedabad
11	MPSE	MPS Electrical Test Laboratory, L&T Ltd., Mysore

9.03 TYPE TESTS TO BE CONDUCTED ON TWO UNITS OF EACH TYPE AND EACH RATING AS PER RELEVANT STANDARD NO. 14697 – 1999/ IEC 687- 1992/ CBIP PUBLICATION NO. 304 / IS - 9000

a) Test of insulation properties
   i) Impulse voltage test
   ii) AC High voltage test
   iii) Insulation test

b) Test of accuracy requirement
   i) Tests on limits of error
   ii) Test on starting condition
   iii) Test on no load condition
   iv) Test of Ambient Temperature influence
   v) Test of repeatability of error
   vi) Test of influence quantities

c) Test of electrical requirement
   i) Test for power consumption
   ii) Test for influence of supply voltage
   iii) Test of influence short time over current
   iv) Test of influence of self heating
   v) Test of influence of heating

e) Test of electromagnetic compatibility
   i) Radio interference measurement
   ii) Fast transient burst test
   iii) Test of immunity to electrostatic discharges
   iv) Test of immunity to electromagnetic HF field

f) Test for climatic influences
   i) Dry heat test
   ii) Cold test
   iii) Damp heat cyclic test

g) Test for mechanical requirements
   i) Vibration test
   ii) Shock test
   iii) Spring hammer test
   v) Protection against penetration of dust and water
   vi) Test of resistance to heat and fire

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

9.04 Tests before Dispatch:

The AC static HT trivector meter shall be subjected, at the manufacturer's works before dispatch, to the following tests as per ISS / IEC / CBIP Publication No. 304 described in clause No. 2 of the specification.

ACCEPTANCE TESTS ON EACH UNIT AS PER RELEVANT STANDARD NO. IS 14697–1999/ IEC 60687-2000 / CBIP PUBLICATION NO. 304 / IS - 9000:

i) AC Voltage test
ii) Insulation resistance test
iii) Tests of limits of errors
iv) Test of meter constant
v) Test of starting condition
vi) Test of no load condition
vii) Repeatability of error test
viii) Test of power consumption

9.05 Tests On Bought Out Items:

Tests are not required to be performed on bought out accessories at the works of the meter manufacturer. Furnishing test certificates of such bought out accessories from the original equipment manufacturers shall be deemed to be satisfactory evidence. Inspection of the tests at Sub – contractors' works will be arranged by the supplier whenever required.

9.06 Routine / Acceptance Tests:

All acceptance tests as specified at clause No. 9.04 shall be got conducted in the presence of Purchaser's representative as per relevant standards described in clause No. 2.0 of the specification. The following additional tests shall also be carried out on one meter of each type from each lot offered for inspection as per relevant standards on the selected samples.

- Shock test
- Vibration test
- Magnetic induction of external origin and
- Verification of temper and fraud detection features and values as per specifications and subsequent agreement between the supplier and purchaser.

Note: Where testing facilities do not exist at the supplier's works for shock and vibration testing as per relevant standards, these

two tests may be carried out in accordance with the provisions of IS: 13010 with latest amendments.

a) All routine tests as stipulated in the relevant standards and described in clause No. 2.0 of the specification shall be carried out and routine test-certificates / reports shall be submitted to the purchaser for approval and also placed inside individual meter packing.
b) The recommended sampling plan and the criteria for acceptance of lot offered for inspection shall be as per annexure E of IS-14697 / 1999 for the meters covered in this specification.

9.07 Tests at Site:

The Purchaser reserves the right to conduct all tests on the meters after arrival at site and the Contractor shall guarantee test certificate figures under actual service conditions.

The supplier should furnish detailed write up for the procedure to be adopted for error testing of the meters in the laboratory and at site/field.

10.0 **INSPECTION:**

All the tests (as mentioned at clause 9.4) and inspection shall be made at the place of manufacturer unless otherwise specially 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 himself that the material is being furnished in accordance with this specification. The purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is a dispute regarding the quality of supply.

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 furnishing material in accordance with the specification and shall not prevent subsequent rejection if the material (s) is /are found to be defective. The bidder shall keep the purchaser informed in advance about the 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 (for domestic supplies) / 30 days (in case of foreign bidders) advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine test. The inspection charges would be to the purchaser's account.

Note for foreign Bidder:

The bidder shall indicate the name(s) of reputed inspection agencies and their inspection charges clearly for each lot. The inspection charges will be borne by the purchaser. However, the purchaser reserves the right to appoint at its cost any inspection agency to carry out the inspection.

10.0 QUALITY ASSURANCE PLAN:

The Bidder shall invariably furnish the following information along with his bid, failing which his bid shall be liable for rejection. Information shall be separately given for individual type of material offered.

a) Statement giving list of important raw materials, names of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested, and the list of tests normally carried out on raw materials in presence of Bidder's representative and copies of test certificates.
b) Information and copies of test certificates as in (a) above in respect of bought out accessories.
c) List of manufacturing facilities available.
d) Level of automation achieved and list of areas where manual processing exists.
e) List of areas in manufacturing process where stage inspections are normally carried out for quality control and details of such tests and inspections.
f) List of testing equipment available with the bidder for final testing of equipment specified and test plant limitations, if any, vis-à-vis the type, special acceptance and routine tests specified in the relevant standards and this specification. These limitations shall be very clearly brought out in a separate schedule of deviations from specified test requirements.
g) The successful bidder shall within 30 days of placement of order, 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 those furnished alongwith offers.
    ii) Type tests certificates of the raw materials and bought out accessories if required by the purchaser.
    iii) Quality assurance plan (QAP) with hold points for purchaser's inspection. The quality assurance plan and purchaser's hold points shall be discussed between the purchaser and bidder before the QAP is finalized.

h) The contractor shall operate systems which implement the following.
    i) Hold point: A stage in the material procurement or workmanship process beyond which work shall not proceed without the documental approval of designated individuals or organizations. The purchaser's written approval is required to authorize work to

progress beyond the hold points indicated in quality assurance plans.

ii) Notification point: A stage in the material procurement or workmanship process for which advance notice of the activity is required to facilitate witness. If the purchaser does not attend after receiving documented notification in accordance with the agreed procedures and with the correct period of notice then work may proceed.

i) The successful bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material at the time of routine testing, if required by the purchaser and ensure that quality assurance requirements of this specification are followed by the sub contractors.

j) The quality assurance plan consists of the quality systems and quality plans with the following details:

1 Quality system:

- The structure of the organization
- The duties and responsibilities assigned to staff ensuring quality of work
- The system for purchasing, taking delivery and verification of materials
- The system for ensuring quality workmanship
- The system for retention of records
- The arrangements for the Contractor's internal auditing.
- A list of administration and work procedures required to achieve and verify contract's quality requirements.

These procedures shall be made readily available to the Inspecting Officer for inspection on request.

2 Quality plans:

- An outline of the proposed work and programme sequence.
- The structure of the Contractor's organization for the contract.
- The duties and responsibilities assigned to staff ensuring quality of work.
- Hold and notification points.
- Submission of engineering documents required by the specification.
- The Inspection of materials and components on receipt.
- Reference to the Contractor's work procedures appropriate to each activity
- Inspection during fabrication/construction
- Final inspection and test

12.0 DOCUMENTATION:

All drawings shall conform to International Standards Organization (ISO) 'A' series of drawing sheet / Indian standards specification IS – 656. All

drawings shall be printed and soft copy in the form of CD(s) shall be supplied. All dimensions and data shall be in S.I. units.

The bidder shall furnish the following drawings and documents along with bid:

a) Two sets of drawings showing clearly the general arrangements, fitting details, electrical connections, etc.
b) Technical leaflets (User's manual) giving operating instructions for the meter.

The successful bidder shall be required to furnish the following drawings and documents at the time of supply of the meters.

a) Four sets of operating manuals / technical leaflets shall be supplied to each consignee for the first instance of supply.
b) One set of routine test certificates shall accompany each dispatch consignment.
c) The acceptance test certificates in case of pre – dispatch inspection or, in cases where inspection is waived, routine test certificates duly approved by the purchaser.

13.0 PACKING & FORWARDING:

a) The equipments shall be suitably packed in order to avoid damage or disturbance during transit or handling. Each meter may be suitably packed in the first instance to prevent ingress of dust and moisture and then placed in a cushioned carton of a suitable material to prevent damage due to shocks during transit. The lid of the carton shall be suitably sealed. A suitable number of sealed cartons may be packed in a case of adequate strength with extra cushioning, if considered necessary. The cases may then be properly sealed against accidental opening in transit. The packing case shall be marked to indicate the fragile nature of the contents.

b) The following information shall be furnished with each consignment:

i) Name of the consignee.
ii) Details of the consignment.
iii) Destination.
iv) Total weight of consignment.
v) Sign showing upper / lower side of the crate.
vi) Sign showing fragility of the material.
vii) Handling and unpacking instructions.
viii) Bills of materials indicating contents of each package and spare materials.

14.0 FURNISHING OF SAMPLES:

a) One No. sample meter of each rating, alongwith all associated software, shall be supplied by the bidder to the Purchaser along with

type test certificates as per clause No. 6.0 of the specification with the bid for checking and testing in RVPN's Meter Testing Laboratory at Jaipur for routine / acceptance tests to ensure that offered meter meets the requirement specified under clause 5 of the specifications. It shall be the responsibility of the bidder to get the sample meter tested in his presence at RVPN's testing laboratories 15 days before opening of the bid. In case of failure to do so, the bid shall be rejected.

b) The details of logic and threshold values for various kinds of tampers as proposed and incorporated by the bidder in their meter samples shall be furnished along with the meter sample(s). The sample(s) should be duly labeled and with full address of the firm with tender enquiry number and date thereupon. Sample(s) should be handed over personally or sent by post well before due date of tender opening (techno – commercial offer). Sample shall not be received against RR or through G/R. After finalization of the tender, the unsuccessful bidder (s) will collect their sample(s) so submitted otherwise department does not hold itself responsible for safe custody of sample(s) so received. The offer received without sample(s) is liable to be ignored.

c) The successful bidder shall supply one No. meter of each type & rating identical to the ones to be supplied along with all associated software, within one month from the date of contract agreement. The sample(s) will be got tested at the discretion of the purchaser at any of the Indian standard laboratories. All the testing charges shall be borne by the purchaser, but in case of failure of the meter to pass the tests, the same will be recovered from the bidder. The bidder can commence the supply only after approval of sample. The unsuccessful type testing will render the contract to be cancelled.

d) Tests to be conducted:

i) Starting condition test.
ii) Power consumption test.
iii) Repeatability of error test.
iv) Accuracy requirements.
v) Voltage variation test (- 30% to + 20%).
vi) Tamper and fraud protection test:
Tests to prove compliance to this specification.
vii) AC and DC magnetic immunity test.
viii) Temper logic and threshold values.
ix) Capability of meter to transmit/communicate data as per specifications.

15.0 GUARANTEE:

The equipments supplied should be guaranteed for its performance for a minimum period of five (5) years from the date of commissioning or five and a half (5½) years from the date of receipt of last consignment in stores, whichever date is earlier. The equipment found defective within the

above guarantee period shall be repaired / replaced by the bidder free of cost within one month of receipt of intimation.

The bidder shall also furnish an undertaking that there shall be no drift in the accuracy class of the meter for a minimum period of 10 years from the date of supply.

16.0 AFTER SALES SUPPORT AND TRAINING:

The supplier shall provide competent and timely after sales service support. The supplier shall also arrange to provide free training at the places as desired by the purchaser for use of meter / Computer Software, etc.

17.0 Make of ABT meters:

The ABT meters shall be supplied from M/s L&T Ltd., M/s Secure Meters, M/s Wallaby and M/s Genus makes only.

Annexure-1

GUARANTEED TECHNICAL PARTICULARS FOR 0.2S CLASS AC STATIC INTER UTILITY TARIFF TRIVECTOR METER FOR EHV SYSTEM OF RSDCL (ABT METERS)

S.NO.	PARTICULARS		
1	a)	Name & Address of Manufacturer	
	b)	Type/designation of meter offered	
	c)	Class of accuracy of :	
		i) Active recording.	
		ii) Reactive recording.	
		iii) Apparent recording.	
		iv) Apparent MD recording.	
	d)	Standards applicable.	
	e)	Whether meter bears BIS certification mark	
2	Type of meter		
	a)	Whether the meter Mounting is projection Type or rack type..	
3	Features		
	a)	Whether the meter is capable to connect auxiliary power supply from VT/CVT and DC voltages?	
4	RATING AND GENERAL PARTICULARS		
	a)	Reference Voltage.	
	b)	Basic Current.	
	c)	Maximum continuous current	
	d)	Power supply variation.	
		Whether meter is suitable for working with following supply system variation:	
		i) Specified operating range	
		ii) Limit range of operation	
		iii) Frequency range	
	e)	Ambient temperature range.	
	f)	Material used for :	
		i) Meter base.	
		ii) Meter Cover.	
		iii) Terminal Block Housing.	
		iv) Terminal Block Cover.	
	g)	Specify technology of manufacture of PCB.	
	h)	a) Whether all parts which are likely to develop corrosion effectively protected against corrosion? Name the type of treatment	

		provided for this purpose.	
		b) Whether insulating parts of meter are non hygroscopic, non ageing & tested quality.	
		c) Whether meter :	
		i) Is provided with RS485 port for periodic data transfer.	
		ii) Is provided with Network port (TCP/IP based) for communication through medium GPRS.	
		iii) Is provided with galvanically isolated optical communication port in front of the meter for data transfer to/from LAPTOP.	
		iv) Is provided with USB port.	
5	Whether sealing arrangement provided on front side of meter for following :		
	i)	Meter Body.	
	ii)	Terminal cover.	
	iii)	Communication port. (Sealing arrangement should be explained by the Bidder in their offer.)	
6	Whether name plate provided on meter with marking as per clause No. 6.22 of specification		
7	TECHNICAL REQUIREMENTS		
	a)	Whether meter measures active and reactive energy in	
		i) 3 Phase 4 Wire principle.	
		ii) Computes in CT-VT secondary quantities.	
		iii) Measures and integrates the energy in four quadrants.	
		iv) Class of accuracy for active and reactive energy.	
		v) Integrates cumulative active energy in export and import in separate registers.	
		vi) Measures voltage as average of RMS value of 3 phases to neutral secondary voltage.	
		vii) Measures VArh in two separate registers one for period average voltage is 103% or higher and other when average voltage is below 97%.	
		viii) Measures cumulative reactive	

		energy in four registers which can be viewed on meter display.	
		ix) Whether the meter has built in clock calendar and has	
		a) Accuracy of 2 minutes per year or better	
		b) Day-month-year display and Hour-Min-Second display.	
		c) Clock adjustment/time synchronization through remote BCS or at site by LAPTOP.	
		x) Whether the meter memory has provision of :	
		a) Non volatile memory. Specify retention period under unpowered condition.	
		b) Automatically storing parameters as per clause 5.10.	
		c) Memory for above data for 22 days.	
		d) Availability of data print out in frequency and Watt hour import, export and net in 15 minute block.	
		xi) Whether all meters offered are identical and sealed for no possibility of adjustment except clock.	
		xii) Whether meter shall withstand	
		a) Voltage fluctuation of 115% of rated voltage continuously and 190% of rated for 3 second.	
		b) CT secondary current of 120% of rated continuously and 20 times of maximum current for 0.5 second without damage or maloperation.	
		xiii) Whether automatic backup for clock and calendar of meter is provided by long life battery with life of at least 10 years as long as VT interruption does not exceed two years.	
8	DISPLAY SEQUENCE		
	i)	Whether meter displays parameters listed at clause 7.13 through the selection of key pad or push button(s) or menu selection. Please specify.	

	ii)	Whether detailed phase-wise anomaly information is logged in the meter memory and capable of downloading to the BCS through the LAPTOP and be available for viewing.	
	iii)	Whether alternatively, the above information shall be available on the Base Computer software.	
	iv)	Whether the average power factor displayed for billing purposes exactly matches the average power factor worked out through Wh/VAh.	
	v)	Whether measurement of apparent energy is based on reactive lag and lead.	
	vi)	What is the method of display? Please indicate whether LED/LCD backlit and no. of digits?	
	vii)	Whether display can be identified through symbols/ legend on display itself or through display annunciator?	
9	a)	Whether Power factor range of meter is Zero lag, Unity, to Zero lead.	
	b)	b) Whether meter works as active energy import, export and reactive energy (lag and lead) energy meter.	
	c)	Whether meter's i) starting current is 0.1% Ib at Unity P.F.	
		ii) rated maximum current is 120% Ib	
10	i)	Whether meter is provided with test output accessible from the front of the meter?	
	ii)	Details of test output device provided for Wh & VArh.	
	iii)	Test output should not be configurable through software for active and reactive energy.	
	iv)	Whether output device has LED on front window.	
	v)	Whether provided with connection diagram on inside portion of	

		terminal cover for both 3 phase 4 wire and 3 phase 3 wire.	
11	Whether key pad/push button is provided in front of the main control module.		
12	Whether 3 phase to neutral voltages are monitored through LED showing fall of voltage below 60 % by steady flashing of lamp.		
13	Whether the meter has provision		
	a)	To check healthiness of phase voltages on meter display.	
	b)	To work accurately irrespective of phase sequence of measured voltages.	
	c)	To check correctness of CT and VT connections and polarity through display of CMRI.	
	d)	Of magnetic shielding as per CBIP publication No. 304.	
14	Maximum Demand Registration & Load Survey capability		
	i)	Integration period for maximum demand in VA (15 minutes)?	
	ii)	Basis of integration period calculation - real-time or otherwise. Explain.	
	iii)	Whether load survey for minimum 22 days with integration period of 15 minutes is provided as per clause No. 7.26 .	
	iv)	Whether load survey is provided in terms of graphical form (bar chart) as well as in spread sheet?	
	v)	Whether figures of 24 hourly Wh import/export, VA import/ export are available under each date in the load survey? If yes, Explain how?	
	vi)	Whether billing parameters can be transferred to billing registers on predefined date and time.	
15	Whether following parameters are made available for viewing/printing at Basic Computer Software?		
	i)	MD Reset count	
	ii)	Billing parameters including power on hours and anomaly counts for	

		last 3 months.	
16	i)	Whether meter is capable to measure and register fundamental energy as well as total energy, i.e. fundamental + Harmonics energy?	
	ii)	Whether value of total energy made available through CMRI or Basic Computer Software?	
17	Whether meter is capable of self diagnostic check by indicating malfunctioning/ nonfunctioning? Please furnish details.		
18	Whether meter is capable of detecting following common ways of tampering :		
	i)	Missing Potential.	
	ii)	CT Polarity Reversal.	
	iii)	CT short (bypass)/ Open	
	iv)	Current and voltage unbalance.	
19	i)	Whether power on/off events are logged with date and time?	
	ii)	Whether threshold values of voltage, current, power factor etc. for logging occurrence and restoration are as per clause No. 7.23.	
	iii)	Minimum Nos. of anomaly events shown by the meter.	
	iv)	Whether anomaly event has four compartments for CT reversal, unbalance and power on/off, missing potential, current and voltage	
20	Whether anomaly persistent time for logging is 5 minutes +/-10 seconds and restoration of anomaly is 120 seconds.		
21	Whether snap-shots (numerical values) of voltage, current, power factor & energy (Wh) readings at the time of logging and restoration of any anomaly event are available at the Basic Computer Software end to analyse the recorded anomaly events?		
22	Whether meter is designed in such a way that it would not record anomaly under known system-abnormal conditions?		
23	Year since when the design offered is in vogue.		

24	Reference of certification mark/license.		
25	Is the meter capable of recording correctly both under balanced/unbalanced load conditions?		
26	Miscellaneous.		
	a)	Whether meter software residing in the meter is suitable for communication with Laptop having meter reader software.	
	b)	Whether meter programming count increases by one number every time when password is entered in the meter?	
	c)	Whether snap-shots for following parameters are available at the time of registration of occurrence/restoration of any anomaly?	
		i) Voltage.	
		ii) Current.	
		iii) Power Factor.	
		iv) Energy reading Wh Import/ Export	
	d)	Whether sample of offered meter has been furnished alongwith tender offer? If yes, give details such as Serial No., type, etc.	
	e)	Whether meter is provided with Pulse output coincident with end of each demand period?	
	f)	Confirm that any Interrogation/read operation shall not delete or alter any stored meter Data.	
27	Principle of operation of the meter outlining the methods and stages of computation of various parameters starting from input voltage and current signals including the sampling rate if applicable.		
28	Method adopted to transform voltage and current to the desired low values with explanation on devices used such as CT, VT or potential divider as to how they can be considered superior in maintaining ratio and phase angle for variation of influence		

	quantities and during its service period.		
29	Details of programmable parameter facilities under the following categories		
	i)	Factory programmable	
	ii)	User programmable	
30	Whether meter has open communication protocol as per IS 15959-2011.		

RAJASTNAN SOLAR PARK DEVELOPMENT COMPANY LTD
(A GOVT. OF RAJASTHAN UNDERTAKING COMPANY)

TURNKEY PROJECT FOR

DESIGN, SUPPLY, INSTALLATION AND COMMISSIONING OF ABT ENERGY METERS & ITS ASSOCIATED SYSTEM, ACQUISITION OF DATA AND ITS COMMUNICATION / TRANSMISSION TO THE DESIGNATED LOCATIONS.

Volume-II

(Part-IV)

TECHNICAL SPECIFICATION
NO. RSDCL/D(T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

OF

TTB AND METER BOX

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

Volume-II

(Part-IV)

SPECIFICATION FOR TTB AND METER BOX

1. SPECIFICATION FOR TEST TERMINAL BLOCK (TTB)

   Test terminal block shall be rated for 15 Amp. 3 phase 4 wire type made of high grade engineering plastic material having suitable electrical & mechanical properties. The terminal cover of the block shall be made up of transparent material and extended type. There shall be 2Nos. sealing terminals with minimum 2 mm size hole. The terminals & potential links of TTB mount be made of brass coated with nickel – chromium of 16 gauge. There must be provision of 2Nos. mounting holes with sliding facility.

2. SPECIFICATION FOR METER BOX

   Meter box shall be required to house 4/ 2 number of meters. The meter box shall be provided with a window having transparent glass in the door. The door of the box must have the provision for sealing at two places. Suitable circular holes shall be provided at the bottom of the box for cable inlet and outlet. Provision of Earthing bolt shall be provided in box. Name plate of the box must contain the details of supplier, P.O. No., TN No., date of supply etc. The metering box shall be completely enclosed and shall be dustproof, temper proof and shall provide a degree of protection not less than IP-31 in accordance with or ISI2063 IS 2.47 or latest. The meter box shall be free supporting, floor mounted type, smoothly finished. The door shall be gasketed all around with nephroma gasket, ventilation lowers, if provided shall have screen and workmanship shall be such as to provide a neat appearance both on the inside and outside with no works, rivets or bolt heads visible on the outer surface, which shall be true and smooth, each box shall be provided with a compact fluorescent lamp (CFL) fixture for 240V, 9W for internal illumination. All the other communication equipments shall also be mounted in the meter box and shall be completely wired to the terminals blocks suitable for external connections. The cable glands required to suit the external cable sizes shall also be supplied with meter box. Tenderer shall supply all necessary anchor bolts and other material required for securing installation of box. The meter box shall be made of either of the following material.

   a) High grade Engineering plastic with following properties :

      i) UV Stabilized.
      ii) HDT – 85 Deg. C (at 18.5 kg)
      iii) UL rating – VI –UL 94 (flame retardant)
      iv) Environment friendly and easily recyclable
      v) Thickness minimum 2.5 mm in the load bearing side and minimum 2mm on other sides.
      vi) Capable to satisfactory qualify the requirement of following test :-

- Test of material identification.
- Test of mechanical strength as per IS 5133.
- Test for water absorption as per IS-5133.
- Test for stability at high temp. as per IS – 5133.
- Test for withstanding Temp. of boiling water for 5 minutes continuously for non distortion or softening of material.
- Glow wire test at 650 Deg.C as per clause 5.2.4 of CBIP Technical Report No. 88 read with amendments.

b) Cold rolled sheet steel of thickness not less than 3mm for load bearing members side and 2 mm for other sides. The meter box shall be phosphated in accordance with the IS-6005 after cleaning. The box shall be painted with 2 coats of stoved type zinc chromate primer. After this two coats of exterior colours of the synthetic enamel paint shall be applied. The meter box should qualify the test procedure as indicated at a(vi) apart from test for phosphating& painting as per IS.

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(VOLUME-II)

(Part- V)

TECHNICAL SPECIFICATION

NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

OF

LAPTOP

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

VOLUME-II

(Part- V)

TECHNICAL SPECIFICATION OF

LAPTOP

The specification is intended to cover the design, manufacture, assembly, testing at the supplier's/manufacturer's works before dispatch, supply and delivery of LAPTOP for reading/uploading the data of different makes of meters. The Laptop should have memory/space to reside software of reading at least 20 to 25 different makes of meters.

1.0 PRINCIPAL PARAMETERS OF LAPTOP:

Laptop shall be portable, compact and battery powered. It should be capable of reading/ gathering data from ABT Meters equipped with suitable communication ports and meter reading and BCS Software.

2.0 GENERAL TECHNICAL REQUIREMENTS OF LAPTOP :

2.1 PHYSICAL CHARACTERISTICS:

(i) Approved Make :-IBM/DELL/HP
(ii) Processor : Intel Core i5, 2.8 GHZ,3M Cache ,64 bit.
(iii) Chipset & Motherboard : Intel 7 or higher chipset on OEM Motherboard.
(iv) Memory : 4GB,1600MHz DDR3 RAM or higher expandable upto 8GB.
(v) HDD : 500GB,5400RPM(Min.) SATA.
(vi) Display : 15.6" or above TFT active Matrix Wide screen Display.
(vii) Resolution : 1366X 768 WXGA or higher.
(viii) Video controller : Intel HD Graphics with 2GB dedicated memory.
(ix) Wireless connectivity: Integrated wireless IEEE802.11b/g/n, Integrated Blue tooth V4.0.
(x) DVD Writer : Integrated DVD Writer 8X
(xi) Sound : Integrated Stereo speaker.
(xii) Key Board : Key Board with touch pad.
(xiii) Expansion Port : 2X USB3.0,1XUSB 2.0,10/100/1000 Ethernet card S-Video or VGA/HDM (Inbuilt or Adaptor),Multi Format Digital Media card reader, Microphone in, Headphone out and other standard features.
(xiv) Operating System: Microsoft Windows 8.1 or latest (as applicable) pre -installed and Norton/McAfee/Avast/Quickheal Antivirus Software latest version with 3-years license.
(xv) Power Supply Pack : 230V,50HZ,AC Supply with rechargeable Battery comprising of LI-Ion/Li-Polymer battery suitable for atleast 4-hours operation.
(xvi) Lock Port : Kensington lock slot.
(xvii) Webcam : Inbuilt Webcam.

(xviii) Carry bag : To be provided.
(xix) Weight : Less than 2.6 Kg (with DVD Writer).
(xx) Onsite Warranty : 3-years with one year accidental damage protection.
(xxi) Meter Reading Software.
(xxii) Base Computer Software.
(xxiii) Optical sensor connectable to meter optical port and other end to USB port of laptop.
(xxiv) Connecting lead from meter USB port to laptop USB port.

2.2 Ruggedness:

The Laptop shall be able to withstand harsh field environment without physical damage or loss of data.

3.0 HARDWARE AND SOFTWARE REQUIREMENT OF LAPTOP :

3.1 Communication:

The Laptop shall be required to communicate in the following different modes.

a) Downloading\Uploading data from \ to the meter.
b) The Laptop shall be capable to read bar coded information using a bar code scanner from bar-codes of AC static electricity meters by using appropriate scanner and bar-code software.

3.2 Real time clock:

A real time Clock shall be provided in the Laptop and shall have the following features:

Power requirement:	The clock shall have a minimum of 15 days battery back up.
Calendar:	The clock shall have minimum 20 years calendar.
Time drift:.	The time drift of the real time clock, considering all influencing quantities shall not exceed 20 seconds per day.

3.3 Time Setting Facility:

The Laptop shall have the facility to get its time set from the base computer station. Proper security for this shall be ensured. The meter specific Laptop programmes shall have the ability to use Laptop real time clock to tag all time related events.

3.4 Power Supply (Battery):

The Laptop shall have the following features for its power requirements:

a) The Laptop shall be powered by rechargeable battery housed within its enclosure.
b) The average capacity of a charged battery shall be sufficient to communicate with meters and base computer station for at least:

i) FOUR HOURS while communicating through optical interface of meters and

ii) SIX HOURS without powering I\O ports for optical interface or printer etc.

4.0 COMMUNICATION PROTOCOL AND SOFTWARE OF LAPTOP :

4.1 The following software shall be made available with the Laptop**:**

i) Software to be resident in Laptop for the purpose of reading and programming all makes of static meters (ABT) having DLMS or Modbus protocol such as L&T, Secure, Elster, Duke, Genus etc.
ii) BCS software for processing the data so as to read the data by user,
iii)The Laptop should have graphics capability.

4.2 Special requirements:

4.2.1 The Laptop should have facility to draw/display vector diagram of the electrical conditions existing at site to check the healthiness of the connections.

4.2.2 The Laptop should have provision to read the energy registers so that accuracy testing can be done at site with standard calibrating equipment.

4.2.3 The Laptop should have provision to read the various instantaneous electrical parameters at site like voltages, current, PF, phase angles, power (kW, kVAr, kVA), frequency etc.

4.2.4 The Laptop should have facility to estimate the memory space available before reading the meters.

4.2.5 One copy of Laptop software shall be supplied with each Laptop so that this may be loaded on to the Laptop in case the Laptop is required to be formatted for any reason.

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Volume-II

(Part-VI)

TECHNICAL SPECIFICATION

NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

OF

COPPER CONTROL CABLES

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

Part-VI (Volume-II)

TECHNICAL SPECIFICATION FOR PVC INSULATED MULTICORE UN-ARMOURED CONTROL CABLES.

1.0 SCOPE:

The specification covers design, manufacture, testing at the manufacturer's works of 1100V Grade multi core, each core containing appropriate No. of strands of copper conductor, PVC insulated (Heavy duty) and sheathed Un-armoured Control Cables as per sizes specified.

1.1 PVC INSULATED UN-ARMOURED CONTROL CABLES:

The cables are required for the control and supervision of out door/indoor switchgears and power transformers including instrumentation metering, indication and alarm on the control panels and electrical inter-locking between high voltage equipments. With a view to achieve these multifarious requirement, the cables will be laid between individual outdoor equipments and from there to control relay and other allied panels located indoors. The reliability and long life of the control cables is of paramount importance. All the control cables offered against the specification should be suitable for climatic conditions specified in the specification.

2.0 STANDARDS :

2.1 UN-ARMOURED CONTROL CABLES :

1100V Grade multi core, each core containing seven strands of copper conductor, PVC insulated (Heavy duty) and sheathed, Un-armoured control cables, shall conform in all respects to the following relevant ISS with latest editions and amendments.

S.No.	Standard Ref. No.	Title
1.	IS-1554/Pt.I)/1988 with latest amendments.	PVC insulated (Heavy duty) Electric Cables for working voltage upto and including 1100 Volts.
2.	IS-8130/1984 with latest amendments.	Conductors for insulated Electric Cables and flexible cords.
3.	IS-5831/1984 with latest amendments.	PVC Insulation and sheath of Electric Cables.
4.	IS-3961/Pt.II)/1967 with latest amendments.	Current ratings for cables : PVC insulated & PVC Sheathed heavy duty cables.

3.0 DESIGN CRITERIA:

The Cables shall normally be laid in massanary/RCC trenches whether inside or outside the control room building in groups in tier formation or otherwise, but at some places the cables may be laid direct in ground or in air. The cable

may even be laid in vertical formation and in steep gradients at some locations. The cables shall be physically strong to withstand rough installation hazards and thermal /electrical/physical stresses during operation under specified climatic conditions.

4.0 CONSTRUCTIONAL FEATURES:

1100 Volts grade, un-armoured, multicores stranded copper conductor, PVC sheathed control cables shall conform to the requirements imposed in IS:1554 (Part.I)/1988 and latest amendments thereto. All the control cables shall bear ISI certification marks as per IS:1554 (Part.I)/1988 with latest amendment. The cables shall have PVC fillers to provide circular cross section before the inner sheath is applied. The fillers should be suitable for operating temp. of the cable compatable with the insulating material.

5.0 COLOUR SCHEME FOR INDENTIFICATION OF CORES :

The individual cores of cable containing two or more cores shall be identified by different colouring of PVC insulation in accordance with IS:1554 (Part.I)/1988 with latest amendment thereto. However, the PVC sheath may be black or grey.

6.0 CURRENT RATINGS :

The current ratings of the control cables shall correspond to the values recommended as per IS: 3961 (Part-II)/1967 and its latest amendments.

7.0 INSULATION AND SHEATHING :

The insulation shall be polyvinyl chloride compound conforming to requirement of type A compound of IS:5831/1984. The inner and outer sheathing shall be of polyvinyl chloride compound conforming to requirements of type ST-1 of IS:5831/1984 with latest amendment.

8.0 EMBOSSING :

To enable identification of control cable, the word RSDCL, manufacturer's name or mark, TN & Year of manufacture, Electric voltage grade, if any and cable size shall be embossed on the outer sheath of cable at the interval of one meter length.

9.0 MARKING :

Every cable drum shall be clearly marked with indelible ink or with suitable weather resistant paint and shall bear the following particulars.

a) Manufacturer's name, brand name or trade mark, if any.
b) ISI certification mark.
c) Customer's name
d) Type of cable and voltage grade

e) Number of cores
f) Cable size
g) Drum number
h) Purchase order/Tender No.
i) Gross weight of the drum
j) Tare weight of the drum
k) Length of the cable on the drum
l) Direction of rotation of the drum (by means of an arrow).
m) Country of manufacture
n) Year of manufacture

10.0 LATENT DEFECTS ERRORS & OMISSIONS:

10.1 Any cable or part thereof that may develop defects during performance guarantee period shall be promptly replaced by the supplier free of charge.

11. TESTS & INSPECTION:

11.1 TYPE TEST:

All Cables shall comply with the requirement of type tests as laid down in IS-1554 (Part-I) 1988 with its latest amendments excluding optional tests. All type tests mentioned in the relevant IS shall be furnished. The details of type test are as under:

a) Test on Conductor

1) Annealing test (if applicable)
2) Conductor resistance test.

b) Tests for thickness of insulation and sheath.

c) Physical tests for insulation and outer sheath:

1) Tensile strength and elongation at break.
2) Aging in air oven.
3) Shrinkage test.
4) Hot deformation.
5) Loss of mass in air oven.
6) Heat shock test.
7) Thermal stability.

d) Insulation resistance test.
e) High voltage test (Water immersion test).
f) High voltage test at room temperature.
g) Flammability tests :

The purchaser reserves the right to get the material tested in any recognised test house and reject the material if not found as per specification.

Note :- Type test carried out by tenderer in his own R&D unit even if recognised by Govt. shall not be accepted except in case of Govt. undertaking.

11.2 ROUTINE TESTS:

All routine tests as stipulated in the relevant standards shall be carried out by the supplier on each lot offered for inspection.

11.3 ACCEPTANCE TESTS :

All the acceptance tests as mentioned in relevant IS shall be carried out on samples from a lot for the purpose of acceptance test in presence of purchaser's representative.

11.4 INSPECTION:

i) The purchaser shall have access at all times to the works and all other places of manufacture, where the material is being manufactured and the supplier shall provide all facilities for unrestricted inspection of the supplier's works, raw materials, manufacture of the material and for conducting necessary tests at any stage.

ii) The supplier shall keep the purchaser informed in advance about the manufacturing programme so that arrangements could be made for inspection.

iii) No material shall be dispatched from the point of manufacture unless the material has been satisfactorily inspected and tested.

iv) Inspection & acceptance of any quality of material shall in no way relieve the supplier from the responsibility for meeting all the requirements of this specification and shall not prevent subsequent rejection if such material is later found to be defective.

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

11.5 VERIFICATION OF LENGTH:

The supplier/manufacturer shall provide all adequate facilities at his works for inspection of atleast two numbers of cable drums or five percent of the cable drums offered for inspection, whichever is higher, selected at random by the authorized representative of the purchaser for checking/verification of cable length/manufacturing defects by transferring the cable from one drum to the another empty drum and at the same time measuring the length of the cable so transferred by means of the meter. The difference in the average length thus obtained from the declared length by the supplier in the packing list shall be applied to all the drums if the cable is found short during checking the sample lot(s).

11.0 PACKING:

The cables shall be supplied in non-returnable wooden drums with adequate barrel diameter and shall be packed in such a manner that it shall be protected from any kind of damage during transit. Not more than one length shall be wound on one drum. Each end of the cable shall be firmly & properly secured to the drum. The ends of each length shall be sealed before shipment. The supplier shall be responsible for damage, if any on account of defective packing.

12.0 BIS LICENCE CERTIFICATE:

The tenderer shall furnish the attested photocopy of valid BIS Licence Certificate of the manufacturer.

ANNEXURE-2

GUARANTEED TECHNICAL PARTICULAR FOR CONTROL CABLES

1. Name of the Manufacturer and trade name of cable, if any.

2. No. and cross section of cores.

3. No. and diameter of wires per core.

4. Shape of each core.

5. Current carrying capacity :

   a) In air
   b) In conduct.
   c) In trench.

6. Material of conductor.

7. Insulation thickness of individual core, mm

8. a. Thickness of inner sheath, mm
   b. Thickness of outer sheath, mm

9. Nominal over all diameter

10. Minimum bending radius

11. Type and material of armouring

12. temperature rise of conductor of cables.

13. Maximum allowable temperature rise of the cable in conduits.

14. Insulation resistance per K.M. at 20°C.

15. conductor resistance per K.M. at 20°C.

16. Colour scheme of cores.

17. Test voltage both AC & DC between conductors and earth, between any two adjacent conductor and the direction of the test.

18. a) Standard length of cable per drum, mtrs.
    b) Tolerance on standard drum length, mtrs.
    c) Tolerance on ordered quantity for each type of cable.

19. Net weight of drum length Kg.

20. Gross weight per Kg.

21. current rating factor based on variation in ambient air temperature

22. Area of conductor mm2

23. Whether testing facility available for :

    a) Flammability Test
    b) Smoke generation by sheath under fire.
    c) Acid gas generation by sheath during fire.
    d) Oxygen Index Test.
    e) Temperature Index Test.
    f) Thermal stability test.

24. Whether PVC compounding plant available to manufacture fire resistance quality control cables. If so, the capacity.

25. Whether Bidder have ISI certification Mark.

26. Whether sample enclosed with the Bid, Yes/No.

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Volume-II

(Part-VII)

TECHNICAL SPECIFICATION

NO. RSDCL/D (T)/SOLAR PARK/BHADLA/PHASE-II/TN-04

OF

NETWORK SYSTEM HARDWARE AND SOFTWARE

Director (Technical)
Rajasthan Solar Park Development Company Ltd., Jaipur- 302001

Part-VII (Volume-II)

Technical Specification for Network System Hardware and Software

1.0 PROPOSED ARCHITECTURE:

It is the responsibility of the bidder to propose the suitable Architecture. However, as being visualized by the purchaser, the proposed plan is described in the coming clauses.

System design should be such that it should be further extendable/ modifiable as and when desired.

The communication system shall be GPRS. The bidders must clearly furnish their scheme based on the GPRS with the Tender. Alternate Communication System along with associated equipments can be used with the prior approval of purchaser.

The proposed solution must ensure adequate data security (starting from meters to Central Billing Station & SLDC), data storage and system redundancy.

The system shall be designed for continuous operation (24 hours/day, 365 days/year) without any need for shutdowns for any activity.

The functional requirement of the various items, shown in the specification and hereunder are minimum. The bidder must supply the various items as per the requirement of the system to be installed.

2.0 SYSTEM HARDWARE:

2.1 All ABT meter at Pooling Stations & 400kV GSS, Bhadla level shall be connected in daisy chaining on RS485 and then connected to data concentrator & communication hardwares so as the data shall be made available to PC and also communicated to Central Billing Station, Heerapura, Jaipur.

2.1.1 HMI (Human Machine Interface) / PC

a) The user interface shall be based on Windows concepts with graphics and facility for panning, scrolling, zooming, decultering etc.

b) Details of PCs with keyboard and optical mouse (minimum 21" LED monitor)
(Approved make IBM/HP/DELL only)
i)Processor: INTEL Core i3 (4th generation) / AMD A8, 3.0 GHz, 3MB L2 Cache or higher.
ii) Memory type & size: 4 GB, 1600 MHz DDR3 RAM expendable up to 32 GB
iii) OS : Windows 10 with latest service pack preloaded with media, documentation and Microsoft Security Essential and certificate of authenticity.
iv) Hard Disk Capacity (In-built): 500GB SATA 7200 rpm or higher
v) Display Screen size & type: 21” or larger LED Digital Color Monitor
vi) No. & type of serial ports: 2 Nos.
vii) No. & type of parallel ports: 1 Nos
viii) No. of USB ports: Min 6 Nos (Min. 2 in front, 4 in rear)
ix) Compatible UPS
Note:- Necessary CD/ DVD media for drivers/ OS recovery/ Antivirus shall be provided with each PC.
The above mentioned requirement is minimum. As per specification or actual requirement, Bidder has to supply higher version with latest technology

2.2 Printer

It shall be robust & suitable for operation with a minimum of 132 characters per line. The printing operation shall be quiet with a noise level of less than 45 db suitable for location in the control room. Printer shall accept and print all ASCII characters via master control computer units interface.

The printer shall have in-built testing facility. Failure of the printer shall be indicated in the Station HMI. The printer shall have an off line mode selector switch to enable safe maintenance. The maintenance should be simple with provisions for ease of change of print head, ribbon changing, paper insertion etc.

Printer mounted shall be provided with a printer enclosure. The enclosure shall be designed to permit full enclosure of the printer at a convenient level. Plexiglas window shall be used to provide visual inspection of the printer and ease of reading. The printer enclosure shall be designed to protect the printer from accidental external contact & should be removable from hinges at the back and shall be provided with lock at the front.
All reports and graphics prints shall be printed on laser printer.
All printers shall be continuously on line.

2.3 EXTENDIBILITY IN FUTURE

The system shall contain at least 20% spare capacity. In addition to the above, the system shall have the capacity to add additional meters to expand the overall point count of the system by a minimum of 50% of the supplied capacity. Such additional capacity shall be connected and configured as and when required so that the data from these meters can be communicated / transmitted.

3.0 APPLICATION SOFTWARE

In order to ensure robust quality and reliable software functions, the main part of the application software shall consist of standard software modules built as functional block elements. The functional blocks shall be documented and thoroughly tested. They form part of a library. The application software within the control / protection devices shall be programmed in a functional block language.

4.0 TESTS

The System Hardware and Software offered by the bidder shall be subjected to following tests.

4.1 Factory Acceptance Tests

The supplier shall submit a test specification for factory acceptance test (FAT) and commissioning tests of the Network System Hardware and Software.

The manufacturing phase of the SAS shall be concluded by the factory acceptance test (FAT). The purpose is to ensure that the Contractor has interpreted the specified requirements correctly and that the FAT includes checking to the degree required by the user. The general philosophy shall be to deliver a system to site only after it has been thoroughly tested and its specified performance has been verified as far as site conditions can be simulated in a test lab. If the FAT comprises only a certain portion of the system for practical reason, it has to be assured that this test configuration contains at least one unit of each and every type of equipment incorporated in the delivered system.

If the complete system consists of parts from various suppliers or some parts are already installed on site, the FAT shall be limited to sub-system tests. In such a case, the complete system test shall be performed on site together with the site acceptance test (SAT).

4.2 **Integrated Testing**

The integrated system tests shall be performed as detailed in subsequent clauses including every hardware used in this scheme.

4.2.1 Hardware Integration Tests

The hardware integration test shall be performed on the specified systems to be used for Factory tests when the hardware has been installed in the factory. The operation of each item shall be verified as an integral part of system. Applicable hardware diagnostics shall be used to verify that each hardware component is completely operational and assembled into a configuration capable of supporting software integration and factory testing of the system. The equipment expansion capability shall also be verified during the hardware integration tests.

4.3 **Field Tests**

The field tests shall completely verify all the features of Network System hardware and software.

5.0 TRAINING

5.1 **Training**

A one week training programme shall be arranged by the Contractor free of cost, if desired by the purchaser for its staff posted at pooling stations. Techniques and procedures to expand and add equipment such as loggers, monitors and communication channels etc. shall be made clear to the trainee staff.

6.0 ANNUAL MAINTENANCE CONTRACT, IF CONSIDERED BY RSDCL:

6.1 The Annual Maintenance Contract may be for 5 (Five) years from the date of expiry of guarantee period, if desired by the purchaser and it can be extended further on the mutual agreement. The Bidder shall quote rate for maintenance of the system under AMC for 5 years which shall not be considered for bid evaluation.

6.2 Until final acceptance / Taking Over of the network by RSDCL after Comprehensive Maintenance Period (If AMC order is placed), elimination of defects in design, manufacture, material quality, workmanship, erection, replacement of defective parts, to the satisfaction of the Engineer. Cost of dismantling, transport, re-erection, if any, during the elimination of defects/ replacement of the defective items shall be borne by the bidder.

6.3 The software maintenance services would include availability of software 'fixes' and upgraded versions at no extra cost to the Purchaser for a period of 5 years from the date of AMC. At all times, Purchaser should be kept informed of the upgrades and “no-longer-supported‟ versions. Continued upgrade of the supplied system as and when it is developed/ available with the bidder (including sub vendor) is in the scope of Annual Maintenance Contract.

6.4 The bidder should clearly specify the arrangement for maintenance of the systems including all software supplied. Successful bidder shall depute competent personnel as may be required from time to time depending upon the work exigency & quantum of work.

6.5 During Annual Maintenance Period, the Contractor shall take continual actions to ensure the guaranteed availability and shall make available all the necessary resources such as specialist personnel, spare parts, tools, test devices etc. for replacement or repair of all defective parts and shall have prime responsibility for keeping the system operational.

6.6 Licence fees, frequency allocations, liaison charges and any other charges during Maintenance Period shall be in the bidder's account.

6.7 During Annual Maintenance Contract, no spares shall be provided by the Purchaser and if required by the bidder, then it must be included in the prices quoted for the Annual Maintenance Contract. It is the responsibility of the bidder to maintain the system. At the end of the Annual Maintenance Contract, all the faulty equipment shall be got rectified by the bidder before handing over the same to Purchaser. Purchaser may order additional equipment/ spares before finally taking over the system after Annual Maintenance Contract, which the bidder shall have to supply at its finally agreed rates to the Purchaser so that RSDCL may be able to operate & maintain the system thereafter on its own after end of Comprehensive maintenance period.

6.8 The bidder shall also be responsible to provide at his cost all the consumables during Annual Maintenance Contract which shall include Stationary, Printer Cartridges, replacement of equipment due to their wear & tear, Toners, etc. as may be required for Maintenance.

6.9 Continued support (on technical aspects, etc.) free of cost for at least five years even after expiry of contract. Service support, if required could be on payable basis during such period.

6.10 Bidder shall maintain a stock & supply the critical/ mandatory spares of the equipment which it may visualize to become extinct in due course, before such eventuality may arise.

6.11 The Comprehensive Maintenance service shall include Warranty support/ replacements of any faulty equipment associated with this system, system up-gradations, suggesting new better & cheaper equipment due to development in technologies leading to less recurring cost, meeting with functional/ performance requirements even after commissioning.

6.12 Purchaser reserves the right to review the performance of the bidder during Annual Maintenance Contract Period and if found not up to the mark, it may not be continued at the option of the Purchaser.

7.0 RELIABILITY AND AVAILABILITY

The selected vendor shall automatically be bound with a Service Level Agreement with RSDCL on minimum service levels desired herein. Desired availability is of the order of 95% in respect of individual meters, communication channels, individual equipments which substantially affect over all operations. The unit of calculation shall be hour. Calculation of uptime can be done with the following formula:-

$$\text{Monthly Uptime (\%)} = \frac{\text{Total number of hours in the Month} - \text{Total downtime in hours}}{\text{Total number of hours in the Month}} \times 100$$

8.0 Guarantees Required

The availability for the complete system shall be guaranteed by the Contractor. Bidder shall include in their offer the detailed calculation for the availability. The contractor shall demonstrate their availability guaranteed by conducting the availability test on the total system as a whole after commissioning of total meters to all sub-station and CBS, Heerapura, Jaipur.

9.0 GENERAL

1. Separate earthing shall be made available by the contractor as per their requirement.
2. The power supply to communication system shall be provided as per availability at the Pooling Stations & other places..