Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India.

VOLUME-I

(CONTRACT CONDITIONS & SCOPE OF WORKS)

Section-I: Invitation for Bids (IFB)
Section-II: Instruction to Bidders (ITB)
Section-III: Bid Data Sheets (BDS)
Section-IV: General Conditions of Contract (GCC)
Section-V: Special Conditions of Contract (SCC)
Section-VI: Sample Forms and Procedures
Section-VII: Scope of Works

SPECIFICATION No. RECPDCL/TECH/JKPDD/e-Tender/2018-19/6522 dated-08.03.2019
**Name of the assignment:**

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

**SECTION I  
TENDER INFORMATION**

### Important Information

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<tr>
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<td>08.03.2019</td>
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<tr>
<td>2</td>
<td>Last date for queries / seeking clarification</td>
<td>14.03.2019 at 1030 Hours</td>
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<td>3</td>
<td>Pre Bid Meeting (Venue-1)</td>
<td>14.03.2019 at 1200 Hours</td>
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<td>Last date of submission of Tender</td>
<td>28.03.2019 at 1330 Hours</td>
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<td>5</td>
<td>Date of Opening of Technical bid</td>
<td>28.03.2019 at 1400 Hours</td>
</tr>
<tr>
<td>6</td>
<td>Date of Opening of Financial bid</td>
<td>To be intimated later</td>
</tr>
</tbody>
</table>
| 7      | Pre-Bid Meeting Address                    | REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301  
|        |                                            | Tele : 0120-4383783                                             |
| 8      | Tender Document                            | The details can be downloaded free of cost from the websites    |
| 9      | Tender Cost                                | Nil                                                             |
| 10     | EMD #                                      | Rs.63,02,500/-                                                   |
| 11     | Address for Bid submission                 | Shri. Bhupender Gupta, Addl. Chief Executive Officer, REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301  
|        |                                            | Tele : 0120-4383755                                             |
|        |                                            | Email- jkpdd.projects@recpdcl.in/bhupender.g@gmail.com          |
| 12     | Contact Person                             | Shri Dheeraj Anand , Manager (Technical) REC Power Distribution Company Limited (RECPDCL)  
|        |                                            | Phone:0120-4383775                                              |
|        |                                            | Email- jkpdd.projects@recpdcl.in/dheeraj.anand@recpdcl.in       |

- **# The EMD (Earnest Money Deposit)** is to be submitted by all the participating bidders in the form of demand draft or Bank Guarantee of Rs. **63,02,500/-** of any schedule Indian bank in favor of REC Power Distribution Company Limited, Payable at New Delhi with the validity period of 210 days and additional claim period of 90 days.
- MSEs as defined in MSE procurement policy issued by Department of MSME, or are registered with the Central Purchase organization or the concerned Ministry or Department or Start-ups as recognized by Department of Industrial Policy & Promotion(DIPP) are exempted from Earnest Money Deposit and Tender cost, if any. The bidder shall submit their relevant registration certificate issued by governing body valid on the date of publication of bid.
The EMD of unsuccessful bidder will be returned within 210 days after the contract and EMD of successful bidder will also be returned after acceptance of work order and submission of PBG (Performance Bank Guarantee) i.e. 10% of the Contract Value.

The bid shall remain valid for a period of 180 days from the last date of bid opening and shall be extended for further period upto another 180 days on sole discretion of RECPDCL.

The completion period for the contract shall be the period as specified in ITB Sub-Clause 24.1(c) and subsequently in Vol.1 Section VI, Annexure 4.

Bidding will be conducted through the domestic competitive bidding procedures as per the provisions of ITB/BDS and the contract shall be executed as per the provisions of the Contract.

The detailed Qualifying Requirements (QR) are given in the Bidding Document.

The complete Bidding Documents including technical specifications are available at RECPDCL's website www.recpdcl.in, www.recindia.nic.in, www.eprocure.gov.in or www.tenderwizard.com/REC. Interested bidders can download the Bidding Documents and commence preparation of bids to gain time.

A Single Stage Two Envelope e-bidding Procedure followed by e-bidding for price bids will be adopted and will proceed as detailed in the Bidding Documents.

Bids shall be submitted electronically on e-tender web portal www.tenderwizard.com/REC by last date and time of submission of bids. Bid security (i.e. EMD) and Integrity Pact shall be submitted by the bidder in a sealed envelope by last date and time of submission of bids. Techno commercial bid and price bid shall be uploaded on electronically on e-tender web portal www.tenderwizard.com/REC.

Techno Commercial Part shall be opened on the same day i.e. 28.03.2019 the presence of the bidders' representatives who choose to attend in person at the address below at 14:00 hours (IST). Price Bids shall be opened electronically on e-tender web portal in the presence of the bidders' representatives who choose to attend at the time and date at the address given in the intimation for opening of Price bids in accordance with Clause 25 of ITB.

EMPLOYER reserves the right to cancel/withdraw this invitation for bids without assigning any reason and shall bear no liability whatsoever consequent upon such a decision.

All correspondence with regard to the above shall be to the following address.

(By Post/In Person)
Shri Bhupender Gupta,
Addl. Chief Executive Officer

REC Power Distribution Company Limited,
A10, 4th Floor, Krihco Bhawan,
Sector-1, Noida – 201301
Tele: 0120-4383755
Email: ijkppd.projects@recpdcl.in/ Bhupender_g@gmail.com
Fax:0120 4383768

For more information, visit our site at http://www.recpdcl.in

----- End of Section-I (IFB) -----

Page 4 of 444
The EMD of unsuccessful bidder will be returned within 210 days after the contract and EMD of successful bidder will also be returned after acceptance of work order and submission of PBG (Performance Bank Guarantee) i.e. 10% of the Contract Value.

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Email- ikpdd.projects@recpdcl.in/ Bhupender_g@gmail.com
Fax:0120 4383768

For more information, visit our site at http://www.recpdcl.in

----- End of Section-I (IFB) -----

Volume-I : Section-I
Invitation For Bids (IFB)

IPDS& PMDP/SBD/R1
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INSTRUCTION TO BIDDERS (ITB)

Preamble:

This part, Instruction to Bidders (ITB), Section II of the Bidding Documents provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Employer. It also provides information on bid submission, opening and evaluation and on contract award. ITB Section II contains provisions that are to be used unchanged unless part Special Condition of Contract, Section V, which consists of provisions that supplement, amend, or specify in detail, information or requirements included in ITB Section II and that are specific to each procurement, states otherwise. If there is a conflict between the provisions of ITB Section – II & Special Condition of Contract Section – V, the provisions of Special Condition of Contract, Section – V shall prevail.

However, provisions governing the performance of the Contractor, payments under the contract or matters affecting the risks, rights and obligations of the parties under the contract are not included in this section but instead under Section – IV: General Conditions of Contract and/or Section – V: Special Conditions of Contract.

Further in all matters arising out of the provisions of this Section – II and the Section-III of the Bidding Documents, the laws of J&K shall be the governing laws and courts of Jammu & Kashmir shall have exclusive jurisdiction.

(A) Introduction

1.0 General Instructions

1.1 The REC Power Distribution Company Limited (RECPDCL) hereinafter called 'Employer'on behalf of JKPDD (Power Development Department of State of Jammu & Kashmir) will receive bids in respect of materials to be procured as set-forth in the accompanying Specifications. All bids shall be prepared and submitted by bidders in accordance with these instructions.

1.2 Source of funds: The Owner named in the Bidding Documents intends to use the capital subsidy 90% of cost of the infrastructures in the project under PMDP-URBAN a Government of India flagship program for Strengthening and augmentation of sub-transmission & distribution network and 10% to be contributed by State for this project.

1.2.1 All the payments under the contract for the package for which this invitation for Bids is issued shall be made by the RECPDCL (who is also named as Project Implementing Agency (PIA) by Ministry of Power/GoI) on behalf of JKPDD

1.3 For the purpose of implementation of subject package, REC Power Distribution Company Limited (Central CPSUs) shall be referred as Employer and the State Government of concerned state where the works are to be executed shall be referred as "The Owner".

2.0 Eligibility of Bidder:

2.1 This Invitation for Bids, issued by Employer is open to all firms including company (ies), Government Owned Enterprises registered and incorporated in India as per Company Act, 1956/2013 (with amendment from time to time) barring Government department as well as foreign bidders/MNCs not registered and incorporated in India and those bidders with whom business is banned by the Employer.

2.2 A Bidder shall not have a conflict of interest. Any Bidders found to be have a conflict of interest shall be disqualified. The bidder may be considered to have conflict of interest with one or more parties in this bidding process, if:

2.2.1 They have a controlling partner in common,

2.2.2 They receive or have received any direct or indirect subsidy from any of them; or
2.2.3 They have the same legal representative for purpose of this bid; or

2.2.4 They have a relationship with each other, directly or through common third parties, that puts them in position to have access to information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

2.2.5 A bidder submits more than one bid in the bidding process, either individually [including bid submitted as agent /authorised representative on behalf of one or more manufacturer(s) or through Licensee – Licensor route, wherever permitted as per the provision of Qualification requirement for Bidders], or

2.2.6 A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specification of the materials and services/works that are subject of the bid, or

2.2.7 The Bidder, directly or indirectly shall not be a dependent agency of the Employer.

2.2.8 A prequalification process will be conducted prior to the bidding process, or conducted during process of the bidding, this bidding is open only to prequalified Bidders.

2.3 This bidding is open to any manufacturer who provides satisfactory evidence concerning the following that he:

2.3.1 is a qualified manufacturer who supply of the type specified and has adequate technical knowledge and practical experience;

2.3.2 does not anticipate change in the ownership during the proposed period of work (if such a change is anticipated, the scope and effect thereof shall be defined);

2.3.3 has adequate financial stability and status to meet the financial obligation pursuant to the scope of the works (the Bidders should upload their audited profit and loss account and balance sheet for the last five years);

2.3.4 has adequate field services organisation to provide the necessary field erection and management services required to successfully erect, test and commission the equipment as required by the Specifications and Documents; and

2.3.5 has established quality assurance systems and organisation designed to achieve high levels of equipment reliability, both during his manufacturing and field installation activities.

2.4 The above stated requirements are a minimum and Employer reserves the right to request for any additional information and also reserves the right to reject the Proposal of any Bidder, if in the opinion of Employer, the qualification data is incomplete or the Bidder is found not qualified to satisfactorily perform the Contract.

3.0 Deleted

3.1 Deleted.

3.2 Deleted

4.0 Cost Of Bidding

4.1 The Bidder shall bear all costs and expenses associated with preparation and submission of its bid including post-bid discussions, technical and other presentations etc, and Employer 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

5.0 Contents of bidding documents:
5.1 The goods and services required, bidding procedures and Contract terms are prescribed in the Bidding Document. The Bidding Document is a compilation of the following and shall include amendments, if any, thereto:

**VOLUME – I: Condition of contract:**

- **Section I:** Invitation for Bid (Section - IFB)
- **Section II:** Instructions to Bidders (Section – ITB)
- **Section III:** Bid Data sheets (BDS)
- **Section IV:** General Conditions of Contract (GCC)
- **Section V:** Special Conditions of Contract (SCC)
- **Section VI:** Sample Forms and Procedures (FP)

1. Bid Form & Price Schedule
   1.1 Bid Form
   1.2 Price Schedule
2. Bid Security Form
3. Form of Notification by the Employer to the Bank
   3.a Applicable for forfeiture of Bank Guarantee
   3.b Applicable for conditional claim pending extension of Bank Guarantee by the bidder.
4. Form of ‘Notification of Award of Contract’
   4(a) Form of ‘Notification of Award of Contract’ for Supply of Plant and equipment
   4(b) Form of ‘Notification of Award of Contract’ for Installation of Plant and equipment
5. Form of Contract Agreement
   Alternative A
   Alternative B
5.1 Appendix-1: Terms and Procedures of Payment:
   Grid/Power Substation, and
   11KV, Distribution Transformer, LT and Service connection
5.2 Appendix-2: Price Adjustment
5.3 Appendix-3: Insurance Requirements
5.4 Appendix-4: Time Schedule
5.5 Appendix-5: List of Approved Subcontractors
5.6 Appendix-6: Scope of Works and Supply by the Employer
5.7 Appendix-7: List of Document for Approval or Review
5.8 Appendix-8: Guarantees, Liquidated Damages for Non-Performance
6. Performance Security Form
7. Bank Guarantee Form for Advance Payment
8. Form of Taking over Certificate
9. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in one lot by Employer for performance of its contract.
10. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in instalment by Employer for performance of its contract.
11. Form of Authorisation Letter
12. Form of Trust Receipt for Plant, Equipment and Materials received
13. Form of Extension of Bank Guarantee
14. Form of Power of Attorney for Joint Venture
15. Form of Undertaking by the Joint Venture Partners
16. Format for Evidence of Access to or Availability of Credit/ Facilities
17. Form of Operational Acceptance
18. Form of Safety Plan to be submitted by the Contractor within sixty days of award of contract
19. Form of joint deed of undertaking by the Sub-contractor along with the bidder/contractor
20. Form of Certificate of Financial Parameters for QR

**Section VII:** Scope of Works
5.2 Understanding of bid documents: A prospective Bidder is expected to examine all instructions, forms, terms, technical specifications, tender drawings and scope of works in the Bid documents 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 in 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; and Pre-Bid Meeting:

6.1 If the prospective Bidder finds discrepancies or omissions, in 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/clarification, to Employer at his mailing address indicated in Bidding Documents. Similarly, if a Bidder feels that any important provisions in the documents, such as Governing laws, Taxes and Duties, Defect Liability, Limitation of Liability, Settlement of Disputes, Arbitration, Form of Contact Agreement, Price Adjustment, Bid Guarantees, Contract Performance Guarantee, Compensation for Delay, Payments Terms, Schedule of Execution/Completion of works, will be unacceptable, such an issue should be raised as above. Employer, then, will issue interpretation(s) and clarification(s) as he may think fit in writing or modification of the Bidding Documents that it receives prior to original deadlines prescribed for submission of bids by Employer. The Employer shall not obliged to respond to any request for clarification received later than the above period. Further, mere request for clarification received from the Bidder shall not be a ground for seeking extension in the deadline for submission of bids. Written copies of Employer’s response (including an explanation of the query but not identification of its source) will be sent to all prospective bidders that have received the Bidding Documents / uploaded to the e-portal under amendment or addendum.

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

6.3 LOCAL CONDITIONS: It will be imperative on each Bidder to fully inform himself of all local conditions and factors, which may have any effect on the execution of the Contract covered under these documents and specifications. Employer shall not entertain any request for clarifications from the Bidders, regarding such local conditions. 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 these specifications and documents, will be entertained by Employer. Neither any change in the time schedule of the Contract nor any financial adjustments arising thereof shall be permitted by the Employer, which are based on the lack of such clear information or its effect on the cost of the Works to the Bidder.

6.4 The bidder’s designated representative(s) is/are invited to attend a pre-bid meeting, which, if convened, will take place at the venue and time specified in the Biding Documents. The purpose of the meeting shall be to clarify any issue regarding the Biding Documents in general and the Technical Specifications in particular. The Bidder is requested, as far as possible to submit any question in writing, to reach the Employer not later than one week before the meeting. Minutes of the Meeting, including the text of the questions raised (without identifying the name of the bidders) and the responses given, together with any responses prepared after the meeting, will be transmitted without any delay to all the purchasers of the Bidding Documents.
6.5 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

7.0 Amendment to Bidding Document

7.1 At any time prior to the deadline for submission of bids, the Employer 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).

7.2 The amendment will be uploaded in e-portal (where tender is already uploaded). Bidders are required to regularly check / visit the web-portal for e-procurement and to immediately acknowledge receipt of any such amendments, and it will be assumed that the information contained therein will have been taken into account by the Bidder in its bid. The Employer will bear no responsibility or liability arising out of non-receipt of the same in time or otherwise.

7.3 In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bid, in such cases, the Employer shall notify / upload amended / extended deadline on web-portal for e-procurement and website of the employer.

7.4 All notifications and clarifications also be uploaded by Employer on his web portal / tender portal.

7.5 Such amendments, clarifications, etc, shall be binding on the 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 correspondences and documents relating to the bid, exchanged by the Bidder and Employer shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language so long as accompanied by an English translation of its pertinent passages. Failure to comply with this may disqualify a bid. For purposes of interpretation of the bid, the English translation shall govern.

9.0 Documents Comprising The Bid

9.1 The bidding shall be e-tendering basis. On due date of submission of bids, bids shall be submitted by the bidder on e-tender web portal www.tenderwizard.com/REC. Bid security (i.e. EMD) and Integrity Pact in hard copy (in Original) shall be submitted by the bidder in a sealed envelope by the schedule date and time of submission of bids.

Techno-commercial bid and Price bid (i.e. Price Schedule) shall be uploaded electronically by bidder e-tender web portal www.tenderwizard.com/REC by schedule date and time of submission of bids. Techno-commercial bid shall be opened, in presence of eligible bidders on notified date, time and venue.

The locked price bid shall be opened on notified date and time in presence of participating bidders who have qualified technically and commercially. The price breakup shall be uploaded by bidders online on web portal on due date of submission of bids. The price bids shall be locked and opened on notified date and time pertains to technically and commercially cleared bidders only in presence of participating bidders. Due intimation shall be given to technically and commercially cleared bidders about date and time of opening of on-line bids. The bids shall comprise of the following documents:

Bid Envelope:

(a) **Tender Cost:** Nil

(b) **Bid Security/EMD:** A bid security in sealed separate Packet shall be furnished in accordance with ITB Clause 13 & ITB Clause 16.
(c) **Bid Integrity Pact:** The Bidder shall complete the accompanying Integrity Pact, which shall be applicable for bidding as well as contract execution, duly signed on each page by the person signing the bid and shall be returned by the Bidder in two (2) originals along with the Techno - Commercial Part in a separate packet, duly superscripted with 'Integrity Pact'. The Bidder shall submit the Integrity Pact on a non-judicial stamp paper of Rs. 100/-.

Inner Envelope-(a), Inner Envelope-(b) and Inner Envelope-(c) duly sealed and stamped shall be sealed in an outer envelope named as Bid Envelope.

"The name of the bidder and Tender No. shall be clearly written on all envelopes"

It may be noted that the hard copy should be an exact replica of the uploaded offer documents. For evaluation purposes the uploaded offer documents will be treated as authentic and final.

> *If the Bidder is a consortium, the Integrity Pact shall be signed by all the partners or consortium members.*

Bidder’s failure to submit the Integrity Pact duly signed in Original along with the Bid or subsequently pursuant to ITB Sub-Clause 21.1 shall lead to outright rejection of the Bid.

9.2 Alternative bids shall not be accepted,

9.3 Each Bidder shall upload with its Techno-commercial Part the following attachments online only on e-tender web portal www.tenderwizard.com/REC. Hard copy of techno-commercial bid shall not be acceptable.


   b. Attachment 2: Power of Attorney: A power of attorney, duly notarized, indicating that the person(s) signing the bid has (ve) the authority to sign the bid and thus that the bid is binding upon the Bidder during full period of its validity, in accordance with ITB Clause 14.

   c. Attachment 3: Bidder’s Eligibility and Qualifications: In the absence of prequalification, documentary evidence establishing that the Bidder is eligible to bid in accordance with ITB Clause 2 and is qualified to perform the contract in accordance with Annexure – A (BDS), if its bid is accepted.

The documentary evidence of the Bidder’s eligibility to bid shall establish to the Employer’s satisfaction that the Bidder, at the time of submission of its bid, is eligible as defined in ITB Clause 2.

The documentary evidence of the Bidder’s qualifications to perform the contract, if its bid is accepted, shall establish to the Employer’s satisfaction that the Bidder has the financial, technical, production, procurement, shipping, installation and other capabilities necessary to perform the contract, and, in particular, meets the experience and other criteria outlined in the Qualification Requirement for the Bidders in Annexure – A (BDS) and shall also include the complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.

[Note I. In the event the Bidder is not able to furnish the above information of its own (i.e., separate), being a subsidiary company and its accounts are being consolidated with its Group/ Holding/ Parent company, the Bidder should submit the audited balance sheet, income statement, other information pertaining to it only (not of its Group/Holding/Parent company) duly certified by any one of the authority [(i) Statutory Auditor of the Bidder/(ii) Company Secretary of the Bidder a (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.]
Note II. Similarly, if the Bidder happens to be a Group/Holding/Parent company, the Bidder should submit the above documents/information of its own (i.e., exclusive of its subsidiaries) duly certified by any one of the authority mentioned in Note I above certifying that these information/documents are based on audited accounts, as the case may be.]

Unless otherwise mentioned in BDS, bids submitted by a Consortium having not more than three partners with one partner as lead partner, if allowed as per stipulated Qualification Requirements in Annexure-A (BDS), shall comply with the following requirements:

i. The bid shall include all the information required for Attachment 3 as described above for each Consortium partner.

ii. The bid shall be signed so as to be legally binding on all partners.

iii. One of the partners responsible for performing a key component of the contract shall be designated as leader; this authorization shall be evidenced by submitting with the bid a power of attorney signed by legally authorized signatories as per Form-14 of Volume-I : Section-VI (Sample Forms and Procedures).

iv. The leader shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the Consortium, and the entire execution of the contract, including payment, shall be done exclusively with the leader, provided otherwise requested by the Consortium and agreed between the Employer and the leader.

v. All partners of the Consortium shall be liable jointly and severally for the execution of the contract in accordance with the contract terms.

vi. A copy of the agreement entered into by the Consortium partners shall be submitted with the bid as per Form-15 of Volume-I : Section-VI (Sample Forms and Procedures), including interalia delineation of responsibilities and obligations of each partners appended thereto, notwithstanding the joint and several liability.

vii. The Consortium agreement should indicate precisely the responsibility of all members in respect of planning, design, manufacturing, supply, installation, commissioning and training.

viii. All members of consortium should have active participation in execution during the currency of the contract. This should not be varied/modified subsequently without prior approval of the Employer; and

ix. In order for a Consortium to qualify, each of its partners or combination of partners must meet the minimum criteria listed in the Qualification Requirement for the Bidder in enclosed Annexure-A (BDS) for an individual Bidder for the component of the contract they are designated to perform. Failure to comply with this requirement will result in rejection of the Consortium bid.

x. A firm can be a partner in only one Consortium; bids submitted by Consortiums or consortia including the same firm as partner will be rejected.

xi. In the case of a Bidder who offers to supply and/or install plant and equipment under the contract that the Bidder did not manufacture or otherwise produce and/or install, the Bidder shall (i) have the financial and other capabilities necessary to perform the contract; (ii) have been duly authorized by the manufacturer or producer of the related plant and equipment or component as per proforma in attachment 8 to supply and/or
install that item in the Employer’s country; and (iii) be responsible for ensuring that the manufacturer or producer complies with the requirements of ITB Sub-Clause 3.2 and meets the minimum criteria listed for an individual Bidder for that item.

d. Attachment 4: Eligibility and Conformity of the Facilities: Documentary evidence established in accordance with ITB Clause 3 that the facilities offered by the Bidder in its bid are eligible and conform to the Bidding Documents.

The documentary evidence of the eligibility of the facilities shall consist of a statement on the country of origin of the plant and equipment offered, which shall be confirmed by a certificate of origin issued at the time of shipment.

e. Attachment 5: Subcontractors Proposed by the Bidder: The Bidder shall include in its bid details of all major items of supply or services that it proposes to purchase or sublet, and shall give details of the name and nationality of the proposed Subcontractor, including vendors, for each of those items. Bidders are free to list more than one Subcontractor against each item of the facilities. Their participation should be confirmed with a letter of intent between the parties, as needed, in Attachment 8. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB Clause 2, and that any plant, equipment or services to be provided by the Subcontractor comply with the requirements of ITB Clause 3 and Qualification Requirement for the Bidder, enclosed as Annexure-A(BDS).

The Employer reserves the right to delete any proposed Subcontractor from the list prior to award of contract, and after discussion between the Employer and the Contractor, the Appendix-5 of Volume-I:Section VI - Form of Contract Agreement shall be completed, listing the approved Subcontractors for each item concerned.

f. Attachment 6: Deviations: In order to facilitate evaluation of bids, deviations, if any, from the terms and conditions or Technical Specifications shall be listed in Attachment 6 to the bid. The Bidder is required to provide the cost of withdrawal for such deviations. However, the attention of the bidders is drawn to the provisions of ITB Sub-Clause 22.3 regarding the rejection of bids that are not substantially responsive to the requirements of the Bidding Documents.

Bidder’s attention is also drawn to the provisions of ITB Sub-Clause 22.3.1.

g. Attachment 8: Manufacturer’s Authorisation Form

h. Attachment 9: Work Completion Schedule.

i. Attachment 10: Guarantee Declaration.

j. Attachment 11: Information regarding ex-employees of Employer in Bidder’s firm.

k. Attachment 12: NA

l. Attachment 14: Integrity Pact: The Bidder shall complete the accompanying Integrity Pact, which shall be applicable for bidding as well as contract execution, duly signed on each page by the person signing the bid and shall be returned by the Bidder in two (2) originals alongwith the Techno - Commercial Part in a separate packet, duly superscribed with ‘Integrity Pact’. The Bidder shall submit the Integrity Pact on a non-judicial stamp paper of Rs. 100/-. 
If the Bidder is a Consortium, the Integrity Pact shall be signed by all the partners or consortium members.

Bidder’s failure to submit the Integrity Pact duly signed in Original alongwith the Bid or subsequently pursuant to ITB Sub-Clause 21.1 shall lead to outright rejection of the Bid.

m. Attachment 15: Option for Initial Advance (either Interest Bearing Initial Advance or No Initial Advance) and Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises

In this Attachment, the Bidder is required to clearly mention whether the Bidder would opt for Interest bearing initial advance in addition to providing the other information as above.

n. Attachment 16: Additional Information:
   i. Certificate from their Banker(s) (as per prescribed formats in Form 16, Volume-I : Section-VI (Sample Forms and Procedures)) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders’ Bankers.
   ii. Detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of JV may result in rejection of Bid.
   iii. Any other information which the Bidder intends to furnish.

o. Attachment 17: Declaration for tax exemptions, reductions, allowances or benefits

p. Attachment 18: Declaration

q. Attachment 19: Bank Guarantee verification checklist

r. Attachment 20: Team Structure & its individual Responsibilities

s. Attachment 21: Acceptance form for reverse Auction

10.0 **Bid Form and Price Schedules:**

The Bidder shall complete the Bid Form(s) and submit online on e-tender web portal www.tenderwizard.com/RECOn or before due date and time of submission of bid.

Only Tender Cost, Bid security/EMD and Integrity Pact shall be uploaded online and original of same to be submitted in hard copy with sealed Envelope on or before due date and time of submission of bid.

11.0 **Bid Prices:**

11.1 Unless otherwise specified in the Technical Specifications, bidders shall quote for the entire facilities on a “single responsibility” basis such that the total bid price covers all the Contractor’s obligations mentioned in or to be reasonably inferred from the Bidding Documents in respect of the design, manufacture, including procurement and subcontracting (if any), delivery, construction, installation and completion of the facilities. This includes all requirements under the Contractor’s responsibilities for testing, pre-commissioning and commissioning of the facilities and, where so required by the Bidding Documents, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as may be specified in the
Bidding Documents, all in accordance with the requirements of the General Conditions of Contract. Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.

11.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Documents. If a Bidder wishes to make a deviation, such deviation shall be listed in Attachment 6 of its bid. The Bidder is required to provide the cost of withdrawal for such deviations.

11.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules.

11.3.1 The bid price for which the quantities are to be estimated by the Bidder shall remain constant unless there is change made in the Scope of Work by Employer. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ) /Billing breakup of lumpsum quantities/lot/Set and/or (ii) estimated by the bidder shall be for on account payment purpose only. In case additional quantities, over and above the quantities BOQ/billing breakup and /or estimated by the bidder, are required for successful completion of the scope of work as per Technical Specification, the Bidder shall execute additional quantities of these items for which no additional payment shall be made over and above the lumpsum bid price.

11.3.2 It shall be the responsibility of the bidders to pay all statutory taxes, duties and levies(including GST) and interest, if applicable on account of additional revised invoice issued for actual material supplied to the concerned authorities for such return/supply of surplus material, which would otherwise have been, lawfully payable. The bidders shall submit an indemnity bond to keep Employer harmless from any liability, before release of such material to the bidder by Employer.

11.3.3 Set/Lot/Lump-sum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications.

11.4 In the schedules, Bidder shall give the required details and a breakdown of their price considering and taking into account the Input Tax Credit (ITC) as may be available under the Goods and Services Tax (GST) Laws and Regulations, in the schedules as follows:

**Supply Portion (Section A):**

a) Plant and equipment including mandatory spares, shall be quoted on an EXW (ex-factory, ex-works, ex-warehouse or off-the-self, as applicable) basis and inclusive of Type/Routine etc. shall also be quoted in Section A of Financial Bid form, against line item as applicable.

Further, in case of imported Equipments/items offered as ‘Off the Shelf’ or dispatched directly from the Indian Port of disembarkation, the price of such Equipments/items shall be inclusive of all cost as well as any duties paid/payable in relation to import of such goods (viz., customs duties, GST & levies etc.) considering and taking into account the ITC as may be available under the applicable laws including GST.

The price quoted in respect of all items in the above schedule shall be excluding GST applicable on transaction between the Employer and the Contractor.

**Services Portion (Section B&C):**

b) Installation, Commissioning and any other Services Charges shall be quoted separately in Section B of Financial Bid form and shall include rates and prices for all labour, Contractor’s equipment, temporary works, materials, consumables and all matters and things of whatsoever nature, provision of operations and maintenance manuals, etc. wherever identified in the Bidding Documents as necessary for the proper execution of all services except those priced in other sections of Financial Bid form. The price quoted in respect of all items in the above schedule shall be excluding GST.
c) Local/inland transportation, In-transit insurance, loading and unloading of the Plant and Equipment including mandatory spares to be supplied shall be quoted in Section C of Financial Bid form. It is the Employer’s understanding that as per extant provisions, on the charges for supply of services related to Inland transportation, In-transit insurance, loading and unloading by the Bidder to the Employer, GST is not payable. The Bidder is, however, advised to check the position from their own sources. If payable, the same shall be to the Bidder’s account and Employer shall not reimburse any GST on this account.

d) Bidders may like to ascertain availability of exemptions, reductions, allowances or benefits in case of goods and services to be supplied to the Employer. They shall solely be responsible for obtaining such benefits, and in case of failure to receive such benefits for any reasons whatsoever, the Employer will not compensate the Bidder.

e) Further, if issuance of the necessary certificate for availing such exemptions, reductions, allowances or benefits is permitted and is required to be issued by the Employer in line with the relevant policies, rules and procedures of Govt. of India in vogue, the same shall be considered for issuance by the Employer, provided the Bidder explicitly indicates in their bid that they have quoted prices after considering the applicable concessional duty/exemption. However, the Bidder alone shall be responsible for obtaining any benefits there from as may be admissible under Govt. policies/procedures and in case of their failure to receive such benefits, partly or fully, for any reason whatsoever, the Employer will neither be responsible nor be liable to compensate the Contractor, and the Employer shall have no financial liability on this account.

Where the Bidder has quoted taking into account such benefits, he must give all information required for issuance of such certificate in terms of the relevant notifications of the Govt. of India along with his bid. In case bidder has not indicated such information, the same shall be construed to mean that no benefit has been passed on by the bidder to the Employer, and the Employer shall not issue any certificate to the contractor for availing the same even if admissible.

f) Employer shall, deduct taxes at source as per the applicable laws/rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor

11.5 NA

12.0 Bid Currencies
12.1 Prices shall be quoted in Indian Rupees Only.

13.0 BID security:
13.1 The Bidder shall furnish, as part of its bid, a bid security in the amount and currency as stipulated in the Bid Documents. The bid security must be submitted in the form provided in the Bidding Documents.

MSEs as defined in MSE procurement policy issued by Department of MSME, or are registered with the Central Purchase organization or the concerned Ministry or Department or Start-ups as recognized by Department of Industrial Policy & Promotion(DIPP) are exempted from Earnest Money Deposit and Tender cost, if any. The bidder shall submit their relevant registration certificate issued by governing body valid on the date of publication of bid..

13.2 The bid security shall, at the bidder's option, be in the form of a crossed bank draft/pay orders/bank guarantee in favour of Employer from a reputed (i) Public Sector Bank located in India; or (ii) Scheduled Commercial Indian Private Bank as per the attached list only [List is placed at Annexure-I to Section-III (BDS)]. Bid security shall remain valid for a period of (30) days beyond the original bid validity period, and beyond any extension subsequently requested under ITB Sub-Clause 14.2. In case of submission of the Bid Security in form of Bank Guarantee, bid security shall be submitted in standard format (Bid security form) provided at Volume-I:Section-VI “Sample forms and procedures”.

IPDS& PMDP/SBD/R1
The Bid Security shall be in favor of REC Power Distribution Company Limited payable at New Delhi.

13.3 Any bid not accompanied by a bid security or an acceptable bid security shall be rejected by the Employer as being nonresponsive, pursuant to ITB Sub-Clause 22.4. The bid security of a consortium must be in the name of the lead partner in the consortium submitting the bid.

13.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than twenty-eight (28) days after the expiration of the bid validity period or 180 days after the contract, whichever is later.

13.5 The successful Bidder shall be required to keep its bid security valid for a sufficient period till the performance security(ies) pursuant to ITB Clause 34 are furnished to the satisfaction of the Employer. The bid security of the successful Bidder will be returned when the Bidder has signed the Contract Agreement, pursuant to ITB Clause 33, and has furnished the required performance security, pursuant to ITB Clause 34.

13.6 The bid security may be forfeited

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

(b) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him in Attachment – Declaration of the Bid; or

(c) If a Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Sub-Clause 27.2; or

(d) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s), within ten days from the date of intimation of post – bid discussion; or

(e) In the case of a successful Bidder, if the Bidder fails within the specified time limit

(i) to sign the Contract Agreement, in accordance with ITB Clause 33, or

(ii) to furnish the required performance security(ies), in accordance with ITB Clause 34 and/or to keep the bid security valid as per the requirement of ITB Sub-Clause 13.5.

13.7 No interest shall be payable by the Employer on the above Bid Security.

14.0 Period of Validity of Bid

14.1 Bids shall remain valid for the period of six months after the date of opening of Techno - Commercial Part pursuant to ITB Sub-Clause 20.1. A bid valid for a shorter period shall be rejected by the Employer as being non-responsive.

14.2 In exceptional circumstance, the Employer may solicit the Bidder’s consent to an extension of the bid validity period. The request and responses thereto shall be made in writing or by e-mail. In case of requirement REPDCL may ask bidder to extend bid validity further. Bidder shall have to extend the validity of EMD & Bid accordingly.

15.0 Format and Signing of Bid

Each and every page of the bid document shall be duly signed & stamped by the authorized signatory and shall be uploaded with bid online.
The bid shall contain no alterations, omissions or additions, unless such corrections are initialed by the person or persons signing the bid.

16.0 Submission of Bids:

Only EMD and Integrity Pact shall be submitted in hard copies as per Clause no. 9.1 of ITB. Rest all the documents shall be submitted online as per Clause No. 9.3 and Clause No. 10 of ITB

17.0 Deadline for Submission of Bids

17.1 Bids must be received by the Employer at the address specified under ITB Sub-Clause 16.2 no later than the time and date stated in the BDS. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bids will be received upto the appointed time on the next working day. Bids once received by the Employer shall not be returned except otherwise provided in the Bidding Documents.

17.2 The Employer may, at its discretion, extend this deadline for submission of bids by amending the Bidding Documents in accordance with ITB Sub-Clause 7.3 for the reasons specified therein at any time prior to opening of bids by the Employer pursuant to ITB Clause 20, in which case all rights and obligations of Employer and bidders will thereafter be subject to the deadline as extended.

18.0 Late Bids

Since bidder has to submitted bids online on e-tender web portal www.tenderwizard/REC so bidder will not be able to upload tender after due time for bid submission on the last date of bid submission. Accordingly bidder may submit their bid sufficiently advance in time to avoid last hour rush.

19.0 Modification and Withdrawal of Bids

19.1 The Bidder may modify or withdraw its bid after submission prior to the deadline prescribed for bid submission.

(E). Bid Opening and Evaluation

20.0 Opening of Techno-Commercial Bid by Employer

The Employer will open the Techno – Commercial Part online on e-portal www.tenderwizard/REC on scheduled date and time of opening of bid in the presence of bidders’ designated representatives who choose to attend, at the time, date, and location stipulated in the BPS. The bidders’ representatives who are present shall sign a register evidencing their attendance. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bids will be received upto the appointed time on the next working day.

20.1 On behalf of Employer, the Integrity Pact will be signed by its representative at the time of Bid Opening. One original of the Integrity Pact will be retained by Employer and the other original will be returned to the representative of the bidders present during bid opening. If the Bidder’s representative is not present during the Bid Opening, the other original shall be sent to the bidder by post/courier.

20.2 The Employer shall prepare minutes of the bid opening in the form of Bid Opening Statement, including the information disclosed to those present in accordance with ITB Sub-Clause 20.1.

21.0 Clarification of Bids

21.1 During bid evaluation, the Employer may, at its discretion, ask the Bidder for a clarification of its bid. In case of erroneous/non submission of documents related to/identified in ITB Sub-Clause 9.3 (b), (n) and (r) or Deed of Joint Undertaking pursuant to ITB Sub-Clause 9.3 (c) & (e), required to be submitted by the Bidder as per the provisions of the Bidding Documents, the Employer may give the Bidder not more than 7 working days’ notice to rectify/furnish such documents, failing which the bid shall be rejected.
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.

22.0 Preliminary Examination of Bid Envelope

22.1 The Employer will examine the bids to determine whether they are complete, whether required sureties have been furnished, whether the documents have been properly signed and uploaded, and whether the bids are generally in order.

22.2 The Employer may waive any minor informality, nonconformity or irregularity in a bid that does not constitute a material deviation, whether or not identified by the Bidder in Attachment 6 to its bid, and that does not prejudice or affect the relative ranking of any Bidder as a result of the technical and commercial evaluation, pursuant to ITB Clause 24.

22.3 Prior to the detailed evaluation, the Employer will determine whether each bid is of acceptable quality, is complete and is substantially responsive to the Bidding Documents. Any deviations, conditionality or reservation introduced in Attachment-6 and/or in the Bid Form, Technical Data Sheets and covering letter, or in any other part of the bid will be reviewed to conduct a determination of the substantial responsiveness of the bidder’s bid. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations, objections, conditionalties or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with the Bidding Documents, the Employer’s rights or the successful Bidder’s obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other bidders who are presenting substantially responsive bids.

22.3.1 Bids containing deviations from critical provisions relating to GCC Clauses 2.14 (Governing Law), 8 (Terms of Payment), 9.3 (Performance Security), 10 (Taxes and duties), 21.2 (Completion Time Guarantee), 22 (Defect Liability), 23 (Functional Guarantee), 25 (Patent Indemnity), 26 (Limitation of Liability), 38 (Settlement of Disputes), 39 (Arbitration) and Appendix 2 to the Form of Contract Agreement (Price Adjustment) will be considered as non-responsive.

22.3.2 Regarding deviations, conditionality or reservations introduced in the bid, which will be reviewed to conduct a determination of substantial responsiveness of the Bidder’s bid as stated in ITB Sub-Clause 22.3, the order of precedence of these documents to address contradictions, if any, in the contents of the bid, shall be as follows:

I. Covering Letter
II. Bid Form
III. Attachment-6: Deviations
IV. Technical Data Sheet

Contents of the document at Sr. No. I above will have overriding precedence over other documents (Sr. No. II to V above). Similarly, contents of document at Sr. No. II above will have overriding precedence over other documents (Sr. No. III to IV above), and so on.

22.4 If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by the Bidder by correction of the nonconformity. The Employer’s determination of a bid’s responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

23.0 Qualification

23.1 The Employer will ascertain to its satisfaction whether Bidders determined having submitted substantially responsive bids are qualified, as per the Qualification Requirement specified in Annexure – A (BDS) to satisfactorily perform the contract. The Employer shall be the sole judge in this regard and the Employer’s interpretation of the Qualification Requirement shall be final and binding.
23.2 The determination will take into account the Bidder’s financial, technical capabilities including production capabilities, in particular the Bidder’s contract work in hand, future commitments & current litigation and past performance during execution of contracts that have been awarded by the Employer on the Bidder. It will be based upon an examination of the documentary evidence of the Bidder’s qualifications submitted by the Bidder in Attachment 3 to the bid, as well as such other information as the Employer deems necessary and appropriate. This shall, however, be subject to assessment that may be carried out, if required, by the Employer as per the provisions of Annexure -A (BDS).

23.3 The Employer may waive any minor informality, nonconformity or irregularity in a bid that does not constitute a material deviation, affecting the capability of the Bidder to perform the Contract.

23.4 An affirmative determination will be a prerequisite for the Employer to evaluate the Techno -Commercial Part and to intimate successful bidders to be present on new date, time & location to open the online price schedules of the Bidder. A negative determination will result in rejection of the Bidder’s bid.

23.5 The bid from those bidders shall not be accepted who failed to submit Performance Security on issue of Letter of Intent (LoI)/Letter of Award (LoA) for any other contract of Employer in past 3 years.

24.0 Evaluation of Techno - Commercial Part

24.1 The Employer will carry out a detailed evaluation of the bids of the qualified bidders in order to determine whether the technical aspects are in accordance with the requirements set forth in the Bidding Documents. In order to reach such a determination, the Employer will examine the information supplied by the bidders, pursuant to ITB Clause 9, and other requirements in the Bidding Documents, taking into account the following factors:

(a) overall completeness and compliance with the Technical Specifications and Drawings; deviations from the Technical Specifications as identified in Attachment 6 to the bid and those deviations not so identified; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non-responsiveness.

(b) Achievement of specified performance criteria by the facilities

(c) Compliance with the time schedule called for in the corresponding Appendix to the Form of Contract Agreement and evidenced as needed in a milestone schedule provided in the bid;

Time schedule (program of performance)

The plant and equipment covered by this bidding shall have the ‘Taking Over’ by the Employer after successful Completion within the period specified in BDS. Bidders are required to base their prices on the time schedule given in Appendix 4 [Volume-I : Section-VI (Sample Forms and Procedures)] to the Form of Contract Agreement (Time Schedule) or, where no time schedule is given in Appendix 4, on the Completion date(s) given above. No credit will be given to earlier completion. Bids offering completion beyond the specified period are liable to be rejected.

(d) Type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services

(e) Any other relevant technical factors that the Employer deems necessary or prudent to take into consideration.

(f) Any deviations to the commercial and contractual provisions stipulated in the Bidding Documents.
(g) Details furnished by the bidder in response to the requirements specified in Volume-II of the Bidding Documents.

(h) The acceptability of the vendors and subcontractors proposed in Attachment 5 to be used by the Bidder will be evaluated. Should a vendor or subcontractor, for the items other than those covered under Annexure-A (BDS), be determined to be unacceptable, the bid will not be rejected, but the Bidder will be required to substitute an acceptable vendor or subcontractor without any change to the bid price.

(i) Bank Guarantee submitted against Bid Security shall be verified independently from issuing bank. On receipt of certification from issuing bank, eligibility of bidder shall be decided for opening of price bid.

25.0 Opening of Price Schedules (ON-LINE) by Employer

25.1 Price Part of only those Bidders shall be opened on-line who are determined as having submitted substantially responsive bids and are ascertained to be qualified to satisfactorily perform the Contract, pursuant to ITB Clause 23 and 24. Such Bidders shall be intimated about the date and time for opening of Price Part by the Employer. A negative determination of the bids pursuant to ITB Clause 23 and 24, shall be notified by the Employer to such Bidders and the price bid uploaded by them shall not be opened.

25.2 The Employer will on-line open Price Bid at the specified time and date in the presence of bidders’ designated representatives who choose to attend, at the time, date, and location stipulated in the intimation for opening of price bid. The bidders’ representatives who are present shall sign a register evidencing their attendance.

25.3 The bidders’ names, the Bid Prices or any discounts, and any such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. The prices and details as may be read out during the bid opening and recorded in the Bid Opening Statement would not be construed to determine the relative ranking amongst the Bidders, or the successful Bidder, and would not confer any right or claim whatsoever on any Bidder. The successful Bidder (also referred to as the \( L_1 \) Bidder) shall be determined as per the provisions of this Section – II and considered for award of contract as provided in ITB Clause 30.

25.4 The Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with ITB Sub-Clause 25.3.

25.5 Bids not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances.

26.0 Conversion to Single Currency

26.1 This shall not be applicable as domestic firms are required to quote the prices in Indian Rupees only.

27.0 Evaluation of Price Bids

27.1 The Employer will examine the Price Bids to determine whether they are complete, whether any computational errors have been made and whether the bids are generally in order.

The Price Bids containing any deviations and omissions from the contractual and commercial conditions and the Technical Specifications which have not been identified in the Bid Forms are liable to be rejected.

27.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity specified by the
Employer, the unit price shall prevail, and the total price shall be corrected. However, in case of items quoted without indicating any quantity or the items for which the quantities are to be estimated by the Bidder, the total price quoted against such items shall prevail. If there is a discrepancy between words and figures, the amount in words will prevail.

The prices of all such item(s) against which the Bidder has not quoted rates/amount (viz., items left blank or against which _-- is indicated) in the Price Schedules will be deemed to have been included in other item(s).

If the discount(s)/rebate(s) offered by the Bidder is a percentage discount and the price component(s) on which the said discount is not indicated in the bid, the same shall be considered on the total bid price [i.e. proportionately on each price component], in the event of award. However, if lump-sum discount is offered, the same shall be considered in full on the Ex-works price component (by proportionately reducing Ex-works price of individual items), in case of award. Further, Conditional discounts/rebates, if any, offered by the bidder shall not be taken into consideration for evaluation. It shall, however, be considered in case of award.

In respect of taxes, duties and other levies indicated by the Bidder in the Bid, which are reimbursable in line with the provisions of the Bidding Documents, the applicable rate and amount thereof shall be ascertained by the Employer based on which, if required, necessary rectification and arithmetical correction shall be carried out by the Employer. The rate and amount so ascertained by the Employer shall prevail.

The subtotal, total price or the total bid price to be identified in Bid Form for this purpose, irrespective of the discrepancy between the amount for the same indicated in words or figures shall be rectified in line with the procedure explained above.

If the Bidder does not accept the correction of errors as per this clause, its 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 case of any inconsistency in the prices furnished in the specified price schedules to be identified in Bid Form for this purpose, the Employer shall be entitled to consider the highest price for the purpose of evaluation and for the purpose of award of the Contract use the lowest of the prices in these schedules.

27.3 The comparison shall be on the total price in Price Schedule.

The comparison shall also include the applicable taxes, duties and other levies, which are reimbursable in line with the provisions of the Bidding Documents.

The Employer's comparison will also include the costs resulting from application of the evaluation procedures described in ITB Sub-Clause 27.4 & 27.5.

27.4 The Employer’s evaluation of a bid will take into account, in addition to the bid prices indicated in Price Schedule Nos. 1 through 4 (online price schedules), the following costs and factors that will be added to each Bidder’s bid price in the evaluation using pricing information available to the Employer, in the manner and to the extent indicated in ITB Sub-Clause 27.5 and in the Technical Specifications:

(a) the cost of all quantifiable deviations and omissions from the contractual and commercial conditions and the Technical Specifications as identified in the evaluation of Bid Envelope, and other deviations and omissions not so identified;

(b) the functional guarantees of the facilities offered - deleted

(c) the performance of the equipment offered;

Bidder shall state the guaranteed performance or efficiency of the Equipment, named in the BPS, in response to the Technical Specifications. Equipment offered shall have a minimum (or a maximum, as the case may be) level of guarantees specified in the Technical Specifications to be considered responsive. Bids offering plant and equipment with guarantees less (or more) than the minimum (or maximum) specified shall be rejected.
(d) the extra cost of work, services, facilities, etc., required to be provided by the Employer or third parties;

(e) any other relevant factors listed in BPS.

The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the contract, shall not be taken into account in bid evaluation.

27.5 Pursuant to ITB Sub-Clause 27.4, the following evaluation methods will be followed:

(a) Contractual and commercial deviations

The evaluation shall be based on the evaluated cost of fulfilling the contract in compliance with all commercial, contractual and technical obligations under this Bidding Documents. In arriving at the evaluated cost, towards deviations identified in the evaluation of bid, the cost of withdrawal indicated by the bidder in Attachment-6 of the Bid Form will be used. If such a price is not given, the Employer will make its own assessment of the cost of such a deviation for the purpose of ensuring fair comparison of bids.

(b) Functional Guarantees of the facilities

For the purposes of evaluation, the adjustment specified in the Technical Specifications will be added to the bid price for each drop (or excess) in the responsive functional guarantees offered by the Bidder, below (or above) either a norm of one hundred (100) or the value committed in the responsive bid with the most performing functional guarantees, as specified in the Technical Specifications.

(c) Performance Guarantees of the Equipment

For the purposes of evaluation, the adjustment specified in the BDS will be added to the bid price.

(d) Work, services, facilities, etc., to be provided by the Employer

Where bids include the undertaking of work or the provision of services or facilities by the Employer in excess of the provisions allowed for in the Bidding Documents, the Employer shall assess the costs of such additional work, services and/or facilities during the duration of the contract. Such costs shall be added to the bid price for evaluation.

27.6 Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an "Evaluated Bid Price." Bid prices quoted by bidders and rectified as per ITB Sub Clause 27.2 shall remain unaltered.

27.8 RECPDCL reserves the right to conduct the reverse auction (if required) for the products/services being asked in the tender. The terms and conditions for such reverse auction event shall be as per the Acceptance Form attached in NIT. The bidders shall mandatorily submit a duly signed copy of the Acceptance Form along with the tender document as a token of acceptance. In case of Reverse Auction, all Technically Qualified bidders shall be allowed to participate in the reverse Auction and the bidder with lowest price after reverse auction shall be considered as the successful bidder.

28.0 Purchase/ Domestic preference:

No preference shall be given to any bidder

29.0 Confidentiality and Contacting the Employer

29.1 After the public opening of bids, information relating to the examination, clarification, and evaluation of bids and recommendations concerning awards shall not be disclosed to Bidders or other persons not officially concerned with this process until the publication of contract award. From the time of bid
opening to the time of contract award, if any Bidder wishes to contact the Employer on any matter related to its bid, it should do so in writing.

29.2 Any effort by a Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in rejection of the Bidder's bid. The Employer shall be the sole judge in this regard.

(F). Award of Contract

30.0 Award Criteria

30.1 Subject to ITB Clause 31, based on total price quoted by the bidders, RECPDCL shall arrange the bids in the ascending order i.e. L1, L2, L3, ... Ln (L1 being the lowest quote), further provided that the Bidders are determined to be qualified, as per the Qualification Requirement specified in Annexure-A (BDS) to perform the contract satisfactorily.

30.2 Approx. 50% of the tentative quantity will be allocated to the L1 successful bidder. For further allocation, (after allocating the quantity to the L1 bidder) based on total price quoted by the bidders, RECPDCL shall arrange the bids in the ascending order i.e. L2, L3, L4 ... and so on (L2 being the second lowest quote and so on) and allocate approx. 30% of the tentative quantity to L2 bidder & approx. 20% of the tentative quantity to L3 bidder subject to matching the L1 rate. In case, L2 bidder and/or L3 bidder do not match the L1 price in such case RECPDCL reserves right to call next lowest bidder(s) for allocation of remaining 30% / 20% quantities at L1 price.

30.3 However, RECPDCL reserves right to select no. of successful bidders at its sole discretion as per requirement of the project.

30.4 In case, certain quantity remains unallocated, it will be mandatory to L1 bidder to supply such unallocated quantities at the rate quoted in financial bid. If the successful bidder(s), to whom Letter of Intent/Purchase Order has been issued does not fulfil any of the conditions specified in bid document or demonstrating unsatisfactory progress/work, RECPDCL reserves the right to annul/cancel the award of work to such successful bidder and allocate such quantity to other performing bidders in orderly/proportionate manner.

30.5 At the time of Award of Contract, if so desired by the Employer, the bidder shall withdraw the deviations listed in Attachment 6 to the Bid Form at the cost of withdrawal stated by him in the bid. In case the bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid, his bid will be rejected and his bid security forfeited.

30.6 Bidder would be required to comply with all other requirements of the Bidding Documents except for those deviations which are accepted by the Employer.

30.7 The Employer reserves the right to vary the quantity of any of the spares and/or delete any items of spares altogether at the time of Award of Contract.

30.8 The mode of contracting with the successful bidder will be as per stipulation outlined in GCC Sub-Clause 2.1 and briefly indicated below:

The award shall be made as follows:

(i) Single Contract: For supply of all equipment and materials and for providing all erection services including inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, Testing and Commissioning including performance testing in respect of all the equipment supplied and any other services specified in the Contract Documents (Services Contract).

Both contracts will contain a cross fall breach clause specifying that breach of one will constitute breach of the other.

30.9 Contract Agreement Documentation: The sequence of contract agreement documentation is given here under:
a. Issuance of Letter of Intent (LoI) by owner and its unconditional acceptance by the bidder within two weeks from date of issuance of LoI
b. Mutual agreement on PERT chart / Delivery Schedule duly signed and accepted by Supplier and Employer within two weeks from date of acceptance of LoI
c. Submission of Contract Performance Security, within 28 days from date of LoI, against supply & erection contract as per clause 9.3.1 of GCC. In case, the L1 bidder does not submit the Performance Security within 28 days from date of award of LoA, the LoA shall be deemed to be cancelled without any notice to the L1 bidder with EMD forfeited.
d. Letter of Award by owner and its unconditional acceptance by the bidder. Letter of Award shall be issued only after mutual agreement & acceptance on PERT chart/Delivery Schedule (as per 30.5 (b) above) and on timely submission of Contract Performance Security against the contract. The acceptance of LoA should be provided with 2 weeks from date of issue of LoA. LoA shall include details of
   i. Pre-bid discussion
   ii. Post-bid negotiation/discussions
   iii. PERT chart
   iv. Contract Performance Guarantee
e. Contract Agreement shall be signed, on unconditional acceptance of Letter of Award by supplier, within 14 days from date of issue of Letter of Award and submission and acceptance of contract performance guarantees (against the contract).

31.0 Employer’s Right to Accept any Bid and to Reject any or all Bids

31.1 The Employer reserves the right to accept or reject any bid, and 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 Employer’s action.

32.0 Notification of Award

32.1 Prior to the expiration of the period of bid validity, the Employer will notify the successful Bidder in writing through Letter of Intent (LoI), that its bid has been technically and commercially accepted. The bidder shall provide unconditional acceptance of LoI within 2 weeks. Bidder will also submit PERT Chart/Delivery schedule within 2 weeks from date of LoI. PERT Chart/ Delivery schedule shall be signed, accepted and mutually agreed by successful bidder and owner within 2 weeks from date of acceptance by LoI. Contract Performance Security shall be submitted by the successful bidder within 28 days from date of LoI. Thereafter, detailed letter of award shall be issued by owner. On unconditional acceptance of Letter of Award, contract agreement shall be signed on submission and acceptance of contract performance security. The notification of award (Letter of Intent) will constitute the formation of the contract.

32.2 The Employer shall publish the results on its website, identifying the bid and Specification numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.

The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with above, requests in writing the grounds on which its bid was not selected.

The Employer shall verify all the credentials submitted by the winning bidder in their bid from the document issuing authority/organisation to check their correctness and validity before execution of agreement.

32.3 Upon the successful Bidder’s furnishing of the performance security pursuant to ITB Clause 34 and their independent verification from issuing bank and acceptance thereof, the Employer will promptly discharge the bid securities, pursuant to ITB Sub-Clause 13.4 & 13.5.
33.0 Signing the Contract Agreement

33.1 At the same time as the Employer notifies the successful Bidder that its bid has been accepted through Letter of Award, the Employer in consultation with the Bidder will prepare the Contract Agreement provided in the Bidding Documents, incorporating all agreements between the parties.

33.2 On unconditional acceptance of Letter of Award, contract agreement shall be signed on submission and acceptance of contract performance security within 2 weeks from date of issue of Letter of Award.

34.0 Performance Security

34.1 Within twenty-eight (28) days after receipt of the Notification of Award through LoI, the successful Bidder shall furnish the performance security for 10% (Ten percent) of the contract price in line with the requirement of Qualification Requirements, in the amount given in the BDS and in the form provided in Volume-I: Section VI, Sample Forms and Procedures, of the Bidding Documents. The performance security of a Consortium shall be in the name of Lead Partner of the Consortium.

34.2 Failure of the successful Bidder to comply with the requirements of ITB Clause 33 or Clause 34.1 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Employer may make the award to the next lowest evaluated Bidder or call for new bids.

34.3 Till receipt and acceptance of contract performance securities of successful bidder, validity of all bids shall be kept valid to facilitate action as per clause 34.2 above.

34.5 In case, the L1 bidder does not submit the Performance Security within 28 days, the LoA shall be deemed to be cancelled without any notice to the L1 bidder with EMD forfeited.

35.0 Fraud and Corruption

It is the Employer’s policy that requires the Bidders, suppliers and contractors and their subcontractors under the contracts to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Employer:

(a) defines, for the purpose of this provision, the terms set forth below as follows:

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

(ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(v) “obstructive practice” is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Employer’s investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation;

or

(bb) acts intended to materially impede the exercise of the Employer’s inspection and audit rights.
(b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;

(c) will sanction a firm or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a contract; and

(d) will have the right to require that the provision be included in Bidding Documents and in contracts, requiring Bidders, suppliers, and contractors and their sub-contractors to permit the Employer to inspect their accounts and records and other documents relating to bid submission and contract performance and to have them audited by auditors appointed by the Employer.

----- End of Section-II (ITB) ----
VOLUME-I: SECTION – III
BID DATA SHEETS (BDS)
BID DATA SHEETS (BDS)

The following bid specific data for the Plant and Equipment to be procured shall amend and/or supplement the provisions in the Instruction to Bidders (ITB)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>ITB Clause Ref. No.</th>
<th>Bid Data Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ITB 1.1</td>
<td>The Owner is: Power Development Department of Jammu &amp; Kashmir Government (JKPDD)</td>
</tr>
<tr>
<td>2.</td>
<td>ITB 1.1</td>
<td>The Employer is: REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301 Tele : 0120-4383755</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kind Attn.: Shri Bhupender Gupta, Addl. Chief Executive Officer, Telephone Nos.: 0120-4383755 E-mail: <a href="mailto:jkpdd.projects@recpdcl.in">jkpdd.projects@recpdcl.in</a>/ <a href="mailto:Bhupender.g@gmail.com">Bhupender.g@gmail.com</a> Fax No.: 0120 4383768</td>
</tr>
<tr>
<td>3.</td>
<td>ITB 1.1</td>
<td>Supplementing ITB 1.1 with the following: For the purpose of execution of the contract, the contractual activities shall be performed by the Employer “for and on behalf of the Owner” except in cases where the Owner itself is statutorily required to do so.</td>
</tr>
<tr>
<td>4.</td>
<td>ITB 6.1</td>
<td>Address of the Employer: REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301 Tele : 0120-4383755</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kind Attn.: Shri Bhupender Gupta, Addl. Chief Executive Officer, Telephone Nos.: 0120-4383755 E-mail: <a href="mailto:jkpdd.projects@recpdcl.in">jkpdd.projects@recpdcl.in</a>/ <a href="mailto:Bhupender.g@gmail.com">Bhupender.g@gmail.com</a> Fax No.: 0120 4383768</td>
</tr>
<tr>
<td>5.</td>
<td>ITB 6.4</td>
<td>Venue, date and time for Pre-bid Meeting: The Bidder’s designated representative is invited to attend a pre-bid meeting, which will take place at the venue and time as given below: 18.03.2019 12:00 PM REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301 Tele : 0120-4383755</td>
</tr>
<tr>
<td>6.</td>
<td>ITB 9.2</td>
<td>Alternative bids shall not be permitted</td>
</tr>
<tr>
<td>7.</td>
<td>ITB 13.1</td>
<td>EMD: Rs.63,02,500/- to be submitted as applicable</td>
</tr>
<tr>
<td>8.</td>
<td>ITB 16.2(a), ITB 16.2(b), ITB 17.1, ITB 19.3 (a) and ITB 20.1</td>
<td>Address for submission of Bids and its modification and withdrawal, if any; Address in Person or by Post: Shri Bhupender Gupta Addl. Chief Executive Officer,</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>ITB Clause Ref. No.</td>
<td>Bid Data Details</td>
</tr>
<tr>
<td>--------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301 Tele : 0120-4383755</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deadline for submission of Bids and its modification and withdrawal, if any Upto <strong>13.30 Hrs</strong> on <strong>28.03.2019</strong> (Indian Standard Time)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Address for Bid Opening: <strong>Shri Bhupender Gupta</strong> Addl. Chief Executive Officer, REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Date : 28.03.2019 Time: 14.00 Hrs (Indian Standard Time)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(a) <strong>Bid Title:</strong> Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu &amp; Kashmir with 5 years FMS including Operation &amp; Maintenance, for Power Development Department (PDD) of Government of J&amp;K under PMDP, IPDS &amp; DDUGJY Schemes of Govt. of India</td>
</tr>
<tr>
<td>9.</td>
<td>ITB 16.3</td>
<td>Supplementing ITB clause 16.3 with the following: In case, pursuant to Ministry of Finance, GOI’s Circular dated 17th July, 2012, the Bank Guarantee is issued using SFMS Platform by the bank’s located in India, the copy of such Bank Guarantee shall be submitted by the bidder along with the Bid Envelope.</td>
</tr>
<tr>
<td>10.</td>
<td>ITB 24.1 (c)</td>
<td>The Time for implementation shall be <strong>36 (Thirty six Months), with 5 years of FMS period post Go-Live</strong></td>
</tr>
<tr>
<td>11.</td>
<td>ITB 27.2</td>
<td>Deleted</td>
</tr>
<tr>
<td>12.</td>
<td>ITB 27.4 (b)</td>
<td>Deleted.</td>
</tr>
<tr>
<td>13.</td>
<td>ITB 27.4 (c)</td>
<td>Deleted.</td>
</tr>
<tr>
<td>14.</td>
<td>ITB 27.5 (b)</td>
<td>Deleted.</td>
</tr>
<tr>
<td>15.</td>
<td>ITB 27.5 (c)</td>
<td>Deleted.</td>
</tr>
</tbody>
</table>

----- **End of Section-III (BDS) --**
Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

Qualification of bidder will be based on meeting the minimum pass/fail criteria specified in Pre-qualifying criteria Part-A, and Pre-qualifying criteria Part-B as demonstrated by the Bidder’s responses in the corresponding Bid Schedules.

Notwithstanding anything stated herein above, the Employer reserves the right to assess the capacity and capability of the bidder to successfully execute the scope of work covered under this RFP within stipulated completion period. This assessment shall inter-alia include (i) document verification; (ii) bidders work/manufacturing facilities visit; (iii) manufacturing capacity, details of works executed, works in hand, anticipated in future & the balance capacity available for present scope of work; (iv) details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (v) details of quality control systems in place; (vi) past experience and performance; (vii) customer feedback; (viii) banker’s feedback etc. The employer reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

Document Indexing: Bidder will attach an Index of documents submitted with this bid mentioning following details. This index will be used to locate the document easily and correlating correct document with correct QR.

1. Pre-qualification requirement – Part A
   1.1. Technical & Financial

   a) The bidder can be an individual organization or a consortium of maximum three (3) organizations meeting the Eligibility & Qualification Criteria specified for its role in consortium.

   b) The Lead/individual bidder can be any of the three agencies as detailed hereunder:

    i. **Meter Manufacturer (MM)**
       OR
    ii. **System Integrator (SI)**
       OR
    iii. **Engineering Procurement Construction (EPC) Contractor**
c) In case Bidder does not manufacture or produce any of major equipment or component of the overall Solution to be provided as the Scope of Work, then the Bidder is required to submit the Manufacturer's/OEM's Authorization Form (MAF) stating the required support from the Manufacturer/OEM with respect to supply, support, etc. for a period of five years from the date of Go-Live of the system. Bidder will submit authorization letter from respective OEM for back to back support.

d) The Lead/individual bidder should meet its respective QR along with the QR of others (as given below) either individual, Consortium or sub-contractor:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Lead/ Individual Bidder</th>
<th>Consortium/Sub-contractor</th>
<th>MM</th>
<th>RF Comm. Provider</th>
<th>SI</th>
<th>MDM Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Meter Manufacturer</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>SI</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>EPC</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

In reference to above table, the bidder shall meet the QR of MM, RF network provider, SI and MDM provider either through individual, Consortium or Sub-contractor, along with its respective QR.

e) All the individuals/consortium partners/ sub-contractors need to fulfill their respective qualification criteria individually as stipulated subsequently.

f) The bidder shall work with the sub-contractors, declared at the time of bidding (MAF submitted along with bid). If, more than one MAF is submitted for any OEM/Services, successful bidder shall select and confirm the same to RECPDCL before execution of work. Change in sub-contractor during the execution phase is not allowed. Replacement of Sub-contractor can only be with prior approval from RECPDCL. The new sub-contractor must fulfill all the qualifying requirements as mentioned in bid document.

g) MSEs/Start-Ups meeting the specified requirement as per Clause 1.1.1 & 1.1.2(F.2), shall be considered qualified as per Clause 1.1.2, if they meet 80% of the requirement specified in Clause 1.1.2(F.1 & F.3) mentioned subsequently. The relevant MSEs/ Start-Ups certificate issued by governing body shall be submitted along with the bid.

h) "Consortium" means firms jointly and severally bound to the Employer for the fulfillment of the provisions of the Contract and such firms shall designate one of such firms to act as a Lead Bidder with authority to bind the consortium. The composition or constitution of the consortium shall not be altered without the prior consent of the Client.

i) In case of consortium, the Consortium and its Members shall comply with the following conditions:

   i. The number of Members in such Consortium shall not exceed 3.

   ii. All partners shall meet the financial requirement given at clause 1.1.2(F.2) individually.
iii. Lead partner shall meet not less than 50% of the financial requirement given at clause 1.1.2 (F.1 & F.3).

iv. Each of other member/partners(s) individually shall meet not less than 25% of the financial requirement given at clause 1.1.2(F.1 & F.3).

v. Provide clarity on the roles and responsibility of each consortium member.

vi. The Consortium will nominate one of the Members as the Lead Member. Such nomination will be supported by a power of attorney from each Member of the Consortium. The Lead Member will have the authority to represent and bind all the Members during the Bid Process and, if the Consortium is identified as the Selected Bidder, execute the Agreement on behalf of the Consortium.

vii. Ensure that a company can be a member of only one consortium (either as lead or as a consortium member) for this project.

viii. Enforce that all the members are part of the contractual arrangement between themselves before submitting the bid. The Consortium is required to submit a binding and enforceable joint bidding agreement duly notarized by Indian notary, and the Members will not be permitted to amend or terminate the joint bidding agreement, at any time during the validity of the Bid without the prior consent of RECPDCL.

ix. Consortium Partners shall be Jointly & Severally Liable for the complete project deliverables

j) The Bidder has to submit detailed roles and responsibilities of Consortium/Sub-contractor partners to RECPDCL along with bid documents.

k) All partner of the consortium shall be liable jointly and severally for the execution of the contract in accordance with the contract terms and a copy of the agreement entered into by the consortium partners having such a provision shall be submitted with the bid, although successful and on-time execution of the project is responsibility of lead bidder, only.

l) If a Bidder (individual, consortium partner & subcontractor), whose Technical Capacity is being relied upon to qualify for award of the Project, has been barred by the GoI, any state government, or any of its instrumentalities from participating in any project or being awarded any contract and the bar subsists on the Bid Due Date, then such Bidder will not be eligible to submit a Bid.

m) Eligibility & Qualifying Requirements/ Criteria (regarding Holding Company): In case a bidder does not satisfy the financial/technical/experience criteria stipulated in this RFP, related to QR on its own, the Holding Company would be required to meet the stipulated respective criteria. In such an event, the bidder would be required to furnish along with its bid, a letter of undertaking from the Holding Company, supported by Board resolution, extending support for the execution of the contract by the bidder in case of award.
n) Bidder will submit all the documents in English (India) or English (US) language. In case, document is submitted other than English language, Equivalent English translation shall be submitted by bidder.

1.1.1. Qualification Requirement (General)

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Qualification Criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.1</td>
<td>Bidder shall be a Company incorporated under the Companies Act 1956/2013.</td>
<td>• Self-attested copy of certificate of incorporation. • Self-attested copy of Memorandum of Association (MoA) and Article of Association (AoA).</td>
</tr>
<tr>
<td></td>
<td>[In case of consortium/Sub-contractor, all need to satisfy this condition]</td>
<td></td>
</tr>
<tr>
<td>G.2</td>
<td>The bidder shall not be blacklisted by any Central/State Govt/PSU or any entity controlled by them under any Central/State Govt/PSU act/rule as on date of bidding.</td>
<td>• Self-declaration for no blacklisting on appropriate non-judicial stamp paper duly notarized.</td>
</tr>
<tr>
<td></td>
<td>[In case of consortium/Sub-contractor, all need to satisfy this condition]</td>
<td></td>
</tr>
</tbody>
</table>

Note: Lead bidder/ consortium partner/ Sub-Contractor all need to fulfill above general requirements.

1.1.2. Qualification Requirement (Financial)

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Qualification Criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.1</td>
<td>Minimum Average annual turnover for the last three financial years ending 31st March 2018 shall not be less than ₹ 410 Cr. [In case of consortium, all partners can jointly satisfy this condition subject to conditions mentioned in clause 1.1(i)]</td>
<td>• Copy of audited statement of account (PL account &amp; balance Sheet) duly certified by CA along with certificate stating the turnover and net worth shall be submitted as proof.</td>
</tr>
<tr>
<td>F.2</td>
<td>Net Worth for the last three financial years should be positive. Net worth means sum total of the paid up capital and free reserves (excluding reserves created out of revaluation) reduced by aggregate value of accumulated losses (including debit balance in profit and loss account)</td>
<td></td>
</tr>
</tbody>
</table>
for current year) and intangible assets.

\[\text{[In case of consortium/ sub-contractor, all are bound to satisfy the above clause individually.]}\]

<table>
<thead>
<tr>
<th>F.3</th>
<th>Bidder shall have liquid assets (LA) and/or evidence of access to or availability of fund based credit facilities of not less than INR 59.00 Cr. and the. Liquid assets would include cash (and equivalents), bank deposits, securities that can be freely traded and receivables which has general certainty of getting received.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[In case of consortium, all partners can jointly satisfy this condition subject to conditions mentioned in clause 1.1(i)]</td>
</tr>
<tr>
<td></td>
<td>• Banker certificate confirming that the Credit facility is earmarked for the Work specified under Bid on receipt of the Bid</td>
</tr>
</tbody>
</table>

1.1.3. Qualification Requirement (Technical) for Meter Manufacturer

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.1</td>
<td>Make in India experience:</td>
<td></td>
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<tr>
<td></td>
<td>Meter manufacturer(s) should be in the business of manufacturing of Static Energy Meters and should have state of the art facility in India for at least three years as ending last day of the month previous to the month in which bids are invited.</td>
<td></td>
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<tr>
<td></td>
<td>• Factory License Certificate/ MoA mentioning nature of Business.</td>
<td></td>
</tr>
<tr>
<td>T.2</td>
<td>AMI and manufacturing capability:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) The bidder must have manufactured &amp; Supplied Smart Meters* in last 7 years in India, ending last day of month previous to the one in which bids are invited, as below:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. One project with minimum 10,000 smart meters or</td>
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<td></td>
<td>ii. Two projects with minimum 6,250 smart meters each or</td>
<td></td>
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<tr>
<td></td>
<td>iii. Three projects with minimum 5,000 smart meters each.</td>
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<tr>
<td></td>
<td>• Client’s PO/ WO/ LOA/ Contract Agreement and Completion Certification/Go-live certificate/Part-commissioning certificate for required number of meters (incase the complete project has not been declared Go-Live) on client Letter head with contact details of clients for verification.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• In case of client is not the utility, the bidder should submit the required documents of the order issued by Lead Bidder to which the main work</td>
<td></td>
</tr>
</tbody>
</table>
b) The bidder shall have manufacturing capacity of 30,000 Smart meters per month in India including SMT PCB Assembly as well as Meter Assembly & Meter testing.

* Smart meter definitions as given in clause 3.2 of IS 16444 (Latest Amendments)

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
</table>
| T.3 | Quality Assurance: The bidder should have quality certifications for its manufacturing and services function.  
- Minimum CMMI Level 3 | • A valid ISO/CMMI certificate on or before the date of publication of the tender. |
| T.4 | Testing facilities: The bidder should have in-house NABL accredited Laboratory since last 2 years. | • A valid registration certificate mentioning issue / renewal / expiry date |
| T.5 | Product certification: BIS Certification for offered product i.e. relevant IS 16444 certification | • Valid Certificate Copies / self-declaration and undertaking for submission of BIS certificate for the offered product within 3 months of the award of the contract failing which PBG shall be forfeited. |

1.1.4. Qualification Requirement (Technical) for System Integrator (SI)

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
</table>
| T.6 | Integration capability between HES/MDAS with utility systems: The SI shall have experience of integration of MDAS or Head-End System with MDM/ Billing/ CRM on standard interfaces and data exchange models (CIM/XML/ Multi speak) for minimum 20,000 consumer end points (cumulatively) in an Indian/Global Utility (Power/ Water/ Gas/ Telecom) having minimum 2 Lakh consumer base in the last 7 years ending last day of the month previous to the month in which bids are invited. | • References along with requisite contract/ PO/ WO. The references should indicate client name, scope of work, project start date and date of completion of Installation.  
• Certificate from the client on successful implementation and operation of the project. |
| T.7 | Quality Assurance: | |
QUALIFICATION OF THE BIDDER

1.1.5. Qualification Requirement (Technical) for EPC Contractor

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.8</td>
<td><strong>License of work:</strong></td>
<td>• License/ Certificate issued by authorized agency.</td>
</tr>
<tr>
<td></td>
<td>The EPC contractor should possess &quot;A&quot; Class license issued by the Electrical inspectorate of Govt of Jammu &amp; Kashmir /Central Inspectorial organization of Govt. of India/ other state Govt. In case bid submitted in consortium, any of partner should possess &quot;A&quot; class electrical license as stated above.</td>
<td></td>
</tr>
</tbody>
</table>
| T.9        | **Experience in Power Sector:** | • Client’s PO/ WO / LOI/ LOA/ Contract/ Certification on client letterhead  
  • Execution / Performance Certificate |
|            | Bidder shall have experience of projects execution in electrical Transmission or sub-transmission & distribution sector in the last 7 years ending last day of the month previous to the month in which bids are invited as below: | |
|            | i. Experience in single completed work costing not less than the amount equal to Rs.469 Cr.  
  Or | |
|            | ii. Experience in two completed work costing not less than the amount equal to Rs.352 Cr individually.  
  Or | |
|            | iii. Experience in three completed work costing not less than the amount equal to Rs.235 Cr individually. | |

Note: 1. Work experiences of the bidder as per above shall be considered only if the works have been executed under Govt./semi-Govt./autonomous body of Central/State Govt./Electricity Power Utility/ Power Dept. in India only

2. EPC contractor must fulfil the QR of EPC as lead bidder along with QR of MM, RF Communication provider, SI & MDM provider either individually, consortium or through sub-contractor.

1.1.6. Qualification Requirement (Technical) for RF Communication Network Provider

<table>
<thead>
<tr>
<th>Sub Clause</th>
<th>Qualification Criteria</th>
<th>Supporting Documents Required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td>Clause</td>
<td>Qualification of the Bidder</td>
<td></td>
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<tr>
<td>--------</td>
<td>-----------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| T.10   | **Presence in Communication Industry:**  
The bidder should have been in the communications network installation / maintenance services business for the last 3 years in India/ Globally (must have support center in India)  
- Certificate of Incorporation and Registration certificate along with Memorandum & Articles of Association. Copy of valid Licenses (In case of RF, Valid certificate issued by Wireless Planning & Coordination (WPC) Wing of the Ministry of Communications, GOI) |
| T.11   | **Implementation capability:**  
The bidder shall have designed and implemented RF mesh communication network infrastructure in any Power/Gas/Water utility in India/ Globally in last 7 years ending last day of month previous to the one in which bids are invited with at least :  
i. one project of minimum 1,60,000 meters  
   or  
ii. two project of minimum 1,00,000 meters each  
   or  
iii. three project of minimum 80,000 meters each  
- References along with requisite contract/ PO/ WO. The references should indicate client name, scope of work, project start date and date of completion of installation.  
- Certificate from the client on successful implementation and operation of the project. |
| T.12   | **Interoperability:**  
The Bidder must have successfully integrated their NIC/ Communication module with at least 2 Indian electric meter manufacturers and seamless integration with HES and/or MDMS.  
- Signed agreements/ MoUs for integration of NIC module and Certificate of successful integration |
| T.13   | **Quality Assurance:**  
a) The Bidder should be an ISO 9001:2015 certified or Bidder should have CMMI Level 3 (minimum) certification.  
b) Bidder should have ISO 27001 certifications.  
- A valid ISO/CMMI certificate on or before the date of publication of the tender. |
2. Pre-qualification requirement – Part B

The Bidder shall also furnish following documents/details with its bid:

a) A certificate from banker (as per format) indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary, the employer may make queries with the Bidders' bankers.

b) The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.

c) Note:

i. In the event the bidder is not able to furnish the information of its own (i.e. separate), being a subsidiary company and its accounts are being consolidated with its group/holding/parent company, the bidder should submit the audited balance sheets, income statements, other information pertaining to it only (not of its group/Holding/Parent Company) duly certified by any one of the authority [(i) Statutory Auditor of the bidder /(ii) Company Secretary of the bidder or (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.

ii. Similarly, if the bidder happens to be a Group/Holding/Parent Company, the bidder should submit the above documents/information of its own (i.e. exclusive of its subsidiaries) duly certified by any one of the authority mentioned in Note - 2.01.3.1 above certifying that this information/documents are based on the audited accounts, as the case may be.

d) Litigation History:

i. The bidder should provide detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of consortium may result in rejection of Bid.

ii. Notwithstanding anything stated, hereinabove, the Employer reserves the right to assess the capacity and capability of the bidder, should the circumstances warrant such assessment in an overall interest of the Employer. The Employer reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.
LIST OF ELIGIBLE SCHEDULED COMMERCIAL PRIVATE INDIAN BANKS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Banks</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>HDFC Bank Ltd.</td>
</tr>
<tr>
<td>2</td>
<td>Axis Bank Ltd.</td>
</tr>
<tr>
<td>3</td>
<td>Kotak Mahindra Bank Ltd.</td>
</tr>
<tr>
<td>4</td>
<td>Federal Bank Ltd.</td>
</tr>
<tr>
<td>5</td>
<td>IndusInd Bank Ltd.</td>
</tr>
<tr>
<td>6</td>
<td>Development Credit Bank Ltd.</td>
</tr>
<tr>
<td>7</td>
<td>ING Vysya Bank Ltd.</td>
</tr>
<tr>
<td>8</td>
<td>Karnataka Bank Ltd.</td>
</tr>
<tr>
<td>9</td>
<td>Karur Vysya Bank Ltd.</td>
</tr>
<tr>
<td>10</td>
<td>Ratnakar Bank Ltd.</td>
</tr>
<tr>
<td>11</td>
<td>South Indian Bank Ltd.</td>
</tr>
<tr>
<td>12</td>
<td>Yes Bank Ltd.</td>
</tr>
<tr>
<td>13</td>
<td>ICICI Bank</td>
</tr>
<tr>
<td>14</td>
<td>IDFC Bank</td>
</tr>
<tr>
<td>15</td>
<td>J&amp;K Bank</td>
</tr>
</tbody>
</table>
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GENERAL CONDITIONS OF CONTRACT (GCC)

Preamble

The Section–IV of the Bidding Documents is named as General Conditions of Contract (GCC) and provides all the rights and obligations of the parties under the Contract. This Section contains provisions which are to be used unchanged unless Section – V named as Special Conditions of Contract (SCC) states otherwise as any changes in GCC or any complementary information that may be needed has been shown in SCC. If there is a conflict between the provisions of Section – IV & Section – V, the provisions of Section – V shall prevail.

In case, modification at any place is left inadvertently, then provision of revised guidelines shall prevail.
A. Definitions and Interpretation

1. Definitions

1.1. The following words and expressions shall have the meanings hereby assigned to them:

(a) “Arbitrator” means the person or persons appointed by agreement between the Employer and the Contractor to make a decision on or to settle any dispute or difference between the Employer and the Contractor referred to him or her by the parties pursuant to GCC Sub-Clause 39.1 (Arbitration) hereof.

(b) “Associate” means a party who has been conjoined by the Contractor to independently execute a pre-selected part of facilities of the contract and grant him the associated contractual rights and obligations, without diluting the overall responsibility of the contractor in respect of the Facilities under the contract.

(c) “Collaborator” or “Parent Company” means the firms/corporations who has provided technological support to the manufacturer for establishing production line for the specific Equipment.

(d) “Commissioning” means operation of the Facilities or any part thereof, if any, as per GCC Sub-Clause 1.1(e) by the Contractor as specified in the Technical Specifications, which operation is to be carried out by the Contractor as provided in GCC Sub-Clause 20.1.3 (Commissioning), for the purpose of Trial – Operation (GCC Sub-Clause 20.1.4).

(e) “Completion” means that the Facilities (or a specific part thereof where specific parts are specified in the SCC) have been completed operationally and structurally and put in a tight and clean condition and that all works in respect of pre-commissioning of the Facilities (or a specific part thereof where specific parts are specified in the SCC) has been completed (wherever required, as per Technical Specifications) and Commissioning followed by Trial – Operation has been completed, as provided in GCC Sub-Clause 20.1 (Completion of Facilities) hereof.

(f) “Contract” means the Contract Agreement entered into between the Employer and the Contractor together with the Contract Documents referred to therein.

(g) “Contract Documents” means the documents listed in Clause 1.1 of Article 1 (Contract Documents) of the Form of Contract Agreement (including any amendments thereto); Volume-I: Section-VI.

(h) “Contract Price” means the sum specified in Clause 2.1 of Article 2 (Contract Price) of the Contract Agreement, subject to such additions or deductions therefrom, as may be made pursuant to the Contract. For the purpose of Liquidated Damages and Contract Performance Guarantee, the “Contract Price” means the sum specified in Clause 2.1 of Article 2 (Contract Price) of the Contract Agreement.

(i) “Contractor” means the firms whose bid to perform the Contract has been accepted by the Employer and is named in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

(j) “Contractor’s Equipment” means all plant, facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not
include Plant and Equipment, or other things intended to form or forming part of the Facilities.

(k) "Contractor’s Representative" means any person nominated by the Contractor and approved by the Employer in the manner provided in GCC Sub-Clause 13.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

(l) "Day" means calendar day of the Gregorian Calendar.

(m) "Defect Liability Period" means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, if any, as per GCC Sub-Clause 1.1(e), during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC Clause 22 (Defect Liability) hereof.

(n) "Effective Date" means the date of Notification of Award from which the Time for Completion shall be determined.

(o) "Employer" means the firm/corporation/ government entity, named in the SCC, who is responsible for getting the Facilities implemented. The Employer may be Owner himself or an agency appointed by the Owner (State/Central PSU) and shall include the legal successors or permitted assigns of the Employer.

(p) "Facilities" means the Plant and Equipment to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.

(q) "GCC" means the General Conditions of Contract hereof.

(r) "Guarantee Test(s)" means the test(s) specified in the Technical Specifications to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Technical Specifications in accordance with the provisions of GCC Sub-Clause 20.2.1 (Guarantee Test) hereof during/after successful Commissioning followed by Trial - Operation.

(s) "Installation Services" means all those services ancillary to the supply of the Plant and Equipment for the Facilities, to be provided by the Contractor under the Contract; e.g., transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of Contractor’s Equipment and the supply of all construction materials required), installation, testing, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc.

(t) "Month" means calendar month of the Gregorian Calendar.

(u) "Notification of Award" means the official notice issued by the Employer notifying the Contractor that his bid has been accepted.

(v) "Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor’s fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GCC Sub-Clause 20.2.2 (Operational Acceptance) hereof after successful Commissioning followed by Trial - Operation.
General Conditions of Contract (GCC)

2. Interpretation

2.1 Contract
The Contracts to be entered into with the successful Bidder shall be as defined in SCC.

2.2 Contract Documents
All documents forming part of the Contract (and all parts thereof) are intended to be correlative, complementary and mutually explanatory, subject to Article 1.2 (Order of Precedence) of the Contract Agreement. The Contract shall be read as a whole.

2.3 Language
The ruling language of the Contract and the language for communications shall be English.

2.4 Singular and Plural

IPDS& PMDP/SBD/R1
The singular shall include the plural and the plural the singular, except where the context otherwise requires.

2.5 Headings

The headings and marginal notes in the General Conditions of Contract are included for ease of reference, and shall neither constitute a part of the Contract nor affect its interpretation.

2.6 Entire Agreement

Subject to GCC Sub-Clause 12.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

2.7 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party hereto.

2.8 Independent Contractor

The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture or other joint relationship between the parties hereto.

Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or Subcontractors and the Employer.

2.9 Consortium

If the Contractor is a consortium (of maximum 3 firms), all such firms shall be jointly and severally bound to the Employer for the fulfillment of the provisions of the Contract and shall designate one of such firms to act as a leader with authority to bind the joint venture. The composition or the constitution of the consortium shall not be altered without the prior written consent of the Employer.

2.10 Non-Waiver

2.10.1 Subject to GCC Sub-Clause 2.10.2 below, no relaxation, forbearance, delay or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.
2.10.2 Any waiver of a party’s rights, powers or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

2.11 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

2.12 Country of Origin

"Origin" means the place where the materials, equipment and other supplies for the Facilities are mined, grown, produced or manufactured, and from which the services are provided. Plant and equipment are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

2.13 Notices

2.13.1 Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing, and shall be sent by personal delivery, special courier, telegraph, facsimile or Electronic Data Interchange (EDI) to the address of the relevant party set out in the Contract Agreement, with the following provisions:

(a) Any notice sent by telegraph, facsimile or EDI shall be confirmed within two (2) days after dispatch by notice sent by special courier, except as otherwise specified in the Contract.

(b) Any notice sent by special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of dispatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped and conveyed to the postal authorities or courier service for transmission by special courier. Provided further that whenever the postal authorities or courier service provide a proof of delivery, the same shall also be applicable for presenting the fact of dispatch.

(c) Any notice delivered personally or sent by telegraph, facsimile or EDI shall be deemed to have been delivered on date of its dispatch.

(d) Either party may change its postal, facsimile or EDI address or addressee for receipt of such notices by ten (10) days’ notice to the other party in writing.

2.13.2 Notices shall be deemed to include any approvals, consents, instructions, orders and certificates to be given under the Contract.

2.14 Governing Law & its Jurisdiction

The Contract shall be governed by and interpreted in accordance with laws of J&K and the Courts of J&K (High Court of concerned state) shall have exclusive jurisdiction in all matters arising under this Contract.

B. Subject Matter of Contract
3. **Scope of Facilities**

3.1 Standards and Regulations: Following CEA regulations shall be applicable during execution of work in additional to Jammu & Kashmir Electricity Act 2010:

a. Construction Regulation – Central Electricity Authority (Technical Standards for construction of electrical plants and electric lines) Regulation, 2010 (as amended time to time)

b. Safety Regulation for construction and O&M - Central Electricity Authority (Safety requirements for construction, Operation and Maintenance of electrical plants and electric lines) Regulation, 2011 (as amended time to time)

c. Connectivity Regulation – Technical Standard for connectivity to the grid (Amendment) Regulation 2013; Technical Standards for connectivity of the Distributed Generation resources, 2013; Central Electricity Authority (Grid Standard) Regulation, 2010 (as amended time to time)

d. Metering Regulations – Central Electricity Authority (Installation and Operation of meters) Regulations, 2006; Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations, 2010 and 2015 (as amended time to time)

e. Central Electricity Authority (Measures relating to safety and Electric supply regulations), 2010 and amendment regulation 2015 (as amended time to time)


3.2 Unless otherwise expressly limited in the Technical Specifications, the Contractor's obligation shall include the provision of all Plant and Equipment and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Pre-commissioning and delivery) of the Plant and Equipment and the installation, completion, commissioning and performance testing of the facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Technical specifications. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labour, materials, equipment, spare parts (as specified in GCC Sub-Clause 3.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures and facilities; transportation (including without limitation, custom clearance, port handling, unloading and hauling to, from and at the Site); storage and training except for those supplies, works and services that will be provided or performed by the Employer, as set forth in Appendix-6 (Scope of Works and Supply by the Employer) to the Contract Agreement.

3.3 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.

3.4 The Contractor shall ensure the availability of spare parts required for the operation and maintenance of the Facilities to the Employer for a minimum period of 5 years from Completion of the Facilities. The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the plant and equipment. If so desired by the Employer, the Contractor shall submit the specifications, price and the terms and conditions relating to the supply thereof for such spares identified by the Employer with validity period of 6 months within 30 days of receipt of request from Employer for its consideration and placement of order.
3.5 The Contractor shall guarantee that in the event of termination of production of spare parts by the Contractor or his Sub-Contractor:

(i) The Contractor shall send advance notification to the Employer of the pending termination, with 2 (two) years' time to permit the Employer to procure needed requirements, and

(ii) Following such termination, the Contractor shall furnish at no cost to the Employer the blueprints, drawings and specification of the spare parts, if requested.

3.6 In case the Contractor fails to supply the spares parts in accordance with the terms stipulated above, the Employer shall sanction the Contractor declaring them ineligible for a stated period of time for future projects.

4. **Time for Commencement and Completion**

4.1 The Contractor shall commence work on the Facilities from the Effective Date of Contract i.e. date of issuance of Letter of Intent (LoI) and without prejudice to GCC Sub-Clause 21.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the corresponding Appendix – 4 (Time Schedule) to the Contract Agreement of Volume-I : Section-VI (Sample Forms and Procedures).

4.2 The Contractor shall attain Completion of the Facilities (or of a part where a separate time for Completion of such part is specified in the Contract) within the time stated under Time for Completion or within such extended time to which the Contractor shall be entitled under GCC Clause 34 hereof.

5. **Contractor's Responsibilities**

5.1 The Contractor shall design, manufacture (including associated purchases and/or subcontracting), install and complete the Facilities with due care and diligence in accordance with the Contract.

5.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site (if access thereto was available) and of other data readily available to it relating to the Facilities as of the date twenty-eight (28) days prior to bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

5.3 The Contractor shall acquire in its name all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located that are necessary for the performance of the Contract, including, without limitation, visas for the Contractor’s and Subcontractor’s personnel and entry permits for all imported Contractor’s Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GCC Sub-Clause 6.3 hereof and that are necessary for the performance of the Contract.

5.4 The Contractor shall comply with all laws in force in J&K/India. The laws will include all local, state, national or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC Sub-Clause 6.1 hereof.
5.5 Any Plant, Material and Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GCC Sub-Clause 2.12 (Country of Origin).

5.6 The Contractor shall permit the Employer to inspect the Contractor’s accounts and records relating to the performance of the Contractor.

5.7 First-aid: The Contractor shall provide necessary first-aid facilities for all his employees, representatives and workmen working at the Site. Enough number of Contractor’s personnel shall be trained in administering first-aid.

5.8 Cleanliness: The Contractor shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc. during the period of Contract. The Contractor shall employ enough number of special personnel to thoroughly clean his work-area at least once in a day. All such rubbish and scrap material shall be stacked or disposed off in a place to be identified by the Project Manager. Materials and stores shall be so arranged to permit easy cleaning of the area. In areas where equipment might drip oil and cause damage to the floor surface, a suitable protective cover of a flame resistant, oil proof sheet shall be provided to protect the floor from such damage.

Similarly the labour colony, the offices and the residential areas of the Contractor’s employees and workmen shall be kept clean and neat to the entire satisfaction of the Project Manager. Proper sanitary arrangement shall be provided by the Contractor, in the work-areas, office and residential areas of the Contractor.

5.9 Fire Protection: The work procedures that are to be used during the erection shall be those, which minimize fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the Site at least once each day. Fuels, oils and volatile or inflammable materials shall be stored away from the construction and equipment and materials storage areas in safe containers. Untreated materials shall not at all be used at Site for any other purpose unless otherwise specified. If any such materials are received with the equipment at the Site, the same shall be removed and replaced with acceptable materials before moving into the construction or storage area.

Similarly, corrugated paper fabricated cartons etc. will not be permitted in the construction area either storage or for handling of materials. All such materials used shall be of waterproof and flame resistant type. All other materials such as working drawings, plans etc., which are combustible but are essential for the works to be executed shall be protected against combustion resulting from welding sparks, cutting flames and other similar fire sources.

All the Contractor’s supervisory personnel and sufficient number of workers shall be trained for firefighting and shall be assigned specific fire protection duties. Enough of such trained personnel must be available at the Site during the entire period of the Contract.

The Contractor shall provide enough fire protection equipment of the types and numbers for the warehouses, office, temporary structures, labour colony area etc. Access to such fire protection equipment shall be easy and kept open at all times.

5.10 Security: The Contractor shall have total responsibility for all equipment and materials in his custody/stores, loose, semi-assembled and/or erected by him at Site. The Contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the Contractor shall enter and leave the project site only with the written permission of the Project Manager in the prescribed manner.
5.11 Contractor’s Area Limits: The Project Manager will mark-out the boundary limits of access roads, parking spaces, storage and construction areas for the Contractor and the Contractor shall not trespass the areas not so marked out for him. The Contractor shall be responsible to ensure none of his personnel move out of the areas marked out for his operations. In case of such a need for the Contractor’s personnel to work out of the areas marked out for him, the same shall be done only with the written permission of the Project Manager.

5.12 Contractor’s Co-Operation with the Employer: In case where the performance of the erection work by the Contractor affects the operation of the system facilities of the Employer, such erection work of the Contractor shall be scheduled to be performed only in the manner stipulated by the Project Manager and the same shall be acceptable at all times to the Contractor. The Project Manager may impose such restrictions on the facilities provided to the Contractor such as electricity, water, etc. as he may think fit in the interest of the Employer and the Contractor shall strictly adhere to such restrictions and co-operate with the Project Manager. It will be the responsibility of the Contractor to provide all necessary temporary instrumentation and other measuring devices required during start-up and operation of the equipment systems, which are erected by him. The Contractor shall also be responsible for flushing and initial filling of all the oil and lubricants required for the equipment furnished and erected by him, so as to make such equipment ready for operation. The Contractor shall be responsible for supplying such flushing oil and other lubricants unless otherwise specified elsewhere in the document and specifications.

6. Employer’s Responsibilities

6.1 The Employer shall ensure the accuracy of all information and/or data to be supplied by the Employer as described in the corresponding Appendix - 6 (Scope of Works and Supply by the Employer) to the Contract, except when otherwise expressly stated in the Contract.

6.2 The Employer/owner shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the corresponding Appendix – 6 (Scope of Works and Supply by the Employer) to the Contract Agreement. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.

6.3 If requested by the Contractor, the Employer/Owner shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.

6.4 The Employer shall be responsible for the continued operation of the Facilities after Taking Over, in accordance with GCC Sub-Clause 20.1.5.

C. Payment

7. Contract Price

7.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Form of Contract Agreement.

7.2 The Contract Price shall be subject to adjustment in accordance with the provisions of Appendix 2 (Price Adjustment) to the Contract Agreement. The Contract Price shall be increased or reduced on account of variation in quantity in accordance with Clause 33 of GCC.
7.3 Subject to GCC Sub-Clauses 5.2 and 6.1 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

8. **Terms of Payment**

8.1 The Contract Price shall be paid as specified in the corresponding Appendix – 1 (Terms and Procedures of Payment) to the Contract Agreement of Volume-I: Section-VI (Sample Forms and Procedures). The procedures to be followed in making application for and processing payments shall be those outlined in the same Appendix.

8.2 All payments shall be made in Indian Rupees under the Contract.

8.3 The Project Manager shall within twenty-one (21) days after receipt of invoices enclosing requisite documents as per payment terms release the payment through electronic mode in designated bank account of the contractor subject to availability of funds.

9. **Securities**

9.1 **Issuance of Securities**

The Contractor shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner and form specified below.

9.2 **Advance Payment Security**

9.2.1 The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with the corresponding Appendix - 1 (Terms and Procedures of Payment) to the Contract Agreement, and in the same currency (ies) with initial validity of up to ninety (90) days beyond the date of Completion of the Facilities in accordance with GCC Sub-Clause 20.1. The same shall be extended by the Contractor time to time till ninety (90) days beyond the actual date of Completion of the Facilities, as may be required under the Contract.

9.2.2 The security shall be in the Form of unconditional Bank Guarantee attached hereto in Volume-I: Section VI - Sample Forms and Procedures. The security shall be discharged after completion of the facilities or relevant part thereof. The advance guarantee shall be reduced on two occasions. First reduction shall be on receipt of 50% supply cost of equipment and second reduction shall be on receipt of 75% supply cost of equipment. The advance BG shall also proportionately reduced to 50% and 25% value respectively of initial advance BG.

- Procedure for submission, reduction of Advance Payment Security is detailed in Appendix-1: Terms and Procedures of payments (refer Volume-I : Section-VI (Sample Forms and Procedures)

9.3 **Performance Security**

9.3.1 The Contractor shall, within twenty-eight (28) days of the notification of Letter of Intent, provide a performance security for the due performance of the Contract in the amount equivalent to Ten percent (10%) of the Contract Price, with a validity up to ninety (90) days beyond the Defect Liability Period. The same shall be extended by the Contractor time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract.

In case, the successful bidder/bidders does not submit the Performance Security within 28 days from date of award of LoA, the LoA shall be deemed to be cancelled without any notice to the successful bidder with EMD forfeited.
9.3.2 The performance security shall be in the Form of unconditional Bank Guarantee attached hereto in the Volume-I : Section VI - Sample Forms and Procedures.

9.3.3 Reduction in the security pro rata to the Contract Price of any part of the Facilities is not admissible. However, if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC Sub-Clause 22.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor pursuant to GCC Sub-Clause 22, is liable for an extended warranty obligation, the performance security shall be reduced to ten percent (10%) of the value of the component covered by the extended warranty.

9.3.4 In case of award of the contract to a Consortium, the Bank Guarantees for performance security and the Bank Guarantee for advance payment shall be submitted in the name of Lead Partner of the Consortium.

9.3.5 In case, the successful bidder/bidders does not submit the PBG within the due period, the LoA shall be deemed to be out rightly cancelled without any notice to the successful bidder/bidders and their EMD forfeited.

9.4 Issuing Banks

The Bank Guarantee for Advance Payment Security and Performance Security are to be provided by the Contractor, which should be issued either:

(a) by a Public Sector Bank located in India, or

(b) a scheduled Indian Bank having paid up capital (net of any accumulated losses) of Rs. 1,000 Million or above (the latest annual report of the Bank should support compliance of capital adequacy ratio requirement) as per attached list only [List is placed at Annexure-I to Section-V (SCC)], or

9.5 Indemnity

9.5.1 For the equipment/material to be provided by the Contractor as well as for owner free issued materials, it will be the responsibility of the Contractor to take delivery, unload and store the materials at Site and execute an Indemnity Bond and obtain authorization letter from Employer as per proforma enclosed at Serial No. 9 – ‘Form for Indemnity Bond to be executed by the Contractor’ of Volume-I : Section VI (Sample Forms and Procedures), in favour of the Employer against loss, damage and any risks involved for the full value of the materials. This Indemnity Bond shall be furnished by the Contractor before commencement of the supplies/taking delivery from owner stores and shall be valid till the scheduled date of Taking Over of the equipment by the Employer.

9.5.2 In case of divisible Contracts, where the Employer hands over his equipment to the Contractor for executing the Contract, then the Contractor shall, at the time of taking delivery of the equipment through Bill of Landing or other dispatch documents, furnish trust Receipt for Plant, Equipment and Materials and also execute an Indemnity Bond in favour of the Employer in the form acceptable to the Employer for keeping the equipment in safe custody and to utilize the same exclusively for the purpose of the said Contract. Samples of proforma for the Trust receipt and Indemnity Bond are enclosed at Serial No. 10 of Volume-I : Section VI (Sample Forms and Procedures). The Employer shall also issue a separate Authorization Letter to the Contractor to enable him to take physical delivery of plant, equipment and materials from the Employer as per proforma enclosed under Section VI (Sample Forms and Procedures).
9A  Acceptance of Bank Guarantees:

IT enabled confirmation system shall be used in addition to existing paper based confirmation system for verification of Bank Guarantee from issuing bank as under:

i. Getting confirmation through digitally signed secured e-mails from issuing banks;

ii. Online verification on company portal with user id and password followed by 2nd stage authentication system generated One Time Password (OTP) on portal for reconfirmation;

iii. E-mail confirmation followed by 2nd stage authentication by system generated SMS through registered mobile and confirmation through SMS to the verifying officer.

Employer shall evolve its own procedure adopting any one or more of the above methods for ensuring genuineness of Bank Guarantees, which is compatible with the guidelines of Banks / Reserve Bank of India in addition to existing paper based confirmation system.

10. Taxes and Duties

10.1 The Contractor shall be entirely responsible for payment of all taxes, duties, license fees and other such levies legally payable/incurred until delivery of the contracted supplies to the Employer.

If it is statutory requirement to make deductions towards such taxes and duties or any other applicable taxes and duties, the same shall be made by the Employer and a certificate for the same shall be issued to the Contractor.

10.2 The Contractor shall be solely responsible for the taxes that may be levied on the Contractor's persons or on earnings of any of his employees and shall hold the Employer indemnified and harmless against any claims that may be made against the Employer. The Employer does not take any responsibility whatsoever regarding taxes under Indian Income Tax Act / equivalent act of J&K, for the Contractor or his personnel. If it is obligatory under the provisions of the Indian Income Tax Act/ equivalent act of J&K, deduction of Income Tax at source shall be made by the Employer.

10.3 In respect of direct transaction between the Employer and the Contractor, the ex-works price is exclusive of all cost as well as duties and tax (viz., custom duties & levies, duties, GST, etc.) paid or payable on components, raw materials and any other items used for their consumption incorporated or to be incorporated in the Plant & Equipment.

Goods and Services Tax (GST) for the Equipment are not included in the ex-works price. These amounts will be payable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.

If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the Country where the site is located, the Employer shall use its best endeavors to enable the Contractor to benefit from such tax savings to the maximum allowable extent.
For payment/reimbursement of tax, wherever applicable, in respect of dispatches made directly from Contractor’s works, invoices raised by the Contractor shall be accepted as documentary evidence and for payment/reimbursement of tax, taxable invoices raised by the Contractor shall be accepted as documentary evidence. Similarly, pre-numbered invoices duly signed by authorized signatory shall be considered as evidence.

10.4 Not Applicable

10.5 Employer would not bear any liability on account of Service Tax. Employer shall, however, deduct such tax at source as per the rules and issue necessary Certificate to the Contractor.

10.6 Taxes on Works Contract, Turnover Tax or any other similar taxes under the Goods and Services Tax Act for services to be performed in India, as applicable is included in Contract Price and Employer would not bear any liability on this account. Employer shall, however, deduct such taxes at source as per the rules and issue Tax Deduction at Source (TDS) Certificate to the Contractor.

10.7 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies and charges prevailing at the date seven (07) days prior to the last date of bid submission (hereinafter called “Tax” in this GCC Sub-clause 10.7). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of the Contract, which was or will be assessed on the Contractor in connection with performance of the Contract, an equitable adjustment of the Contract price shall be made to fully take into account any such change by addition to the Contract price or deduction therefrom, as the case may be, in accordance with GCC Clause 31 (Changes in Laws and Regulations) hereof.

However, these adjustments would be restricted to direct transactions between the Employer and the Contractor for which the taxes and duties are reimbursable by the Employer as per the Contract. These adjustments shall not be applicable on procurement of raw materials, intermediary components etc by the Contractor and also not applicable on the bought out items dispatched directly from sub-vendor’s works to site.

In respect of raw materials, intermediary components etc and bought out items, neither the Employer nor the Contractor shall be entitled to any claim arising due to increase or decrease in the rate of Tax, introduction of a new Tax or abolition of an existing Tax in the course of the performance of the Contract.

D. Intellectual Property

11. Copy Right

11.1 The copyright in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third party, including supplies of materials, the copyright in such materials shall remain vested in such third party.

The Employer shall however be free to reproduce all drawings, documents and other material furnished to the Employer for the purpose of the Contract including, if required, for operation and maintenance.

11.2 The copyright in all drawings, documents and other materials containing data and information furnished to the Contractor by the Employer herein shall remain vested in the Employer.
12. Confidential Information

12.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GCC Clause 12.

12.2 The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the design, procurement of Plant and Equipment, construction or such other work and services as are required for the performance of the Contract.

12.3 The obligation of a party under GCC Sub-Clauses 12.1 and 12.2 above, however, shall not apply to that information which

(a) now or hereafter enters the public domain through no fault of that party
(b) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto
(c) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.

12.4 The above provisions of this GCC Clause 12 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

12.5 The provisions of this GCC Clause 12 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

13. Representatives

13.1 If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of Project Manager. The Employer may from time to time appoint some other person as the project Manager in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. The Employer shall take all reasonable care to see that no such appointment is made at such a time or in such a manner as to impede the progress of work on the Facilities. The Project Manager shall represent and act for the Employer at all times during the currency of the Contract. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided.

All notices, instructions, information and other communications given by the Contractor to the Employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.
13.2 Contractor’s Representative & Construction Manager

13.2.1 If the Contractor’s Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefor, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GCC Sub-Clause 13.2.1 shall apply thereto.

13.2.2 The Contractor’s Representative shall represent and act for the Contractor at all times during the currency of the Contract and shall give to the Project Manager all the Contractor’s notices, instructions, information and all other communications under the Contract. All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor’s Representative or, in its absence, its deputy, except as herein otherwise provided. The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor’s Representative, pursuant to the procedure set out in GCC Sub-Clause 13.2.1.

13.2.3 The Contractor's Representative may, subject to the approval of the Employer (which shall not be unreasonably withheld), at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager. Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Sub-Clause 13.2.3 shall be deemed to be an act or exercise by the Contractor’s Representative.

13.2.3.1 Notwithstanding anything stated in GCC Sub-Clause 13.1 and 13.2.1 above, for the purpose of execution of Contract, the Employer and the Contractor shall finalize and agree to a Contract Coordination Procedure and all the communication under the Contract shall be in accordance with such Contract Coordination Procedure.

13.2.4 From the commencement of installation of the Facilities at the Site until Operational Acceptance, the Contractor’s Representative shall appoint a suitable person as the construction manager, (hereinafter referred to as "the Construction Manager"). The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site through-out normal working hours except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as his or her deputy.

13.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC Sub-Clause 18.3. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.

13.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC Sub-Clause 13.2.5, the Contractor shall, where required, promptly appoint a replacement.
14. **Work Program**

14.1 **Contractor’s Organization**

The Contractor shall supply to the Employer and the Project Manager a chart showing the proposed organization to be established by the Contractor for carrying out work on the Facilities. The chart shall include the identities of the key personnel together with the curricula vitae of such key personnel to be employed within twenty-one (21) days of the Effective Date. The Contractor shall promptly inform the Employer and the Project Manager in writing of any revision or alteration of such an organization chart.

14.2 **Program of Performance**

Within twenty-eight (28) days after the date of Notification of Award, the Contractor shall prepare and submit to the Project Manager a detailed program of performance of the Contract (L2 Network) in the form of the Critical Path Method (CPM), the PERT network, or other internationally used programs and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and pre-commissioning the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion, Commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in Appendix-4 (Time Schedule) to the Contract Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion under GCC Sub-Clause 4.2 and any extension granted in accordance with GCC Clause 34, and shall submit all such revisions to the Project Manager.

In the PERT chart contractor shall highlight clearly timelines for requirement of major high value owner supplied materials.

14.3 **Progress Report**

The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Sub-Clause 14.2 above, and supply a progress report to the Project Manager every month and as & when required.

The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.

14.4 **Progress of Performance**

If at any time the Contractor’s actual progress falls behind the program referred to in GCC Sub-Clause 14.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GCC Sub-Clause 4.2, any extension thereof entitled under GCC Sub-Clause 34.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.
14.5 **Work Procedures**

The Contract shall be executed in accordance with the Contract Documents and the procedures given in the section on Sample Forms and Procedures of the Contract Documents.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

14.6 It is emphasized to conduct monthly contract review meeting with senior most officers of turnkey contractor at their headquarters or at project site. Employer shall decide venue of such monthly contract review meeting. In this meeting, three months rolling plan of mobilization of materials and manpower shall be reviewed. Progress of works achieved on ground shall also be reviewed along with all pending issues related to availability of fronts, payments, contractual issues, if any, etc. Minutes of the meeting shall be issued by Employer within a week time. Performance of contractor shall be reviewed based on commitment and actual achievement on ground. Planning, commitment, review and evaluation of performance of contractor through this meeting shall be under overall agreed project execution plan (PERT Chart).

14.7 It is also emphasized to conduct monthly contract review meeting with sub-contractor in presence of senior most officers of turnkey contractor at their headquarters or at project site. Employer shall decide venue of such review meeting. In this meeting, three months rolling plan of mobilization of materials and manpower shall be reviewed. Progress of works achieved on ground shall also be reviewed along with all pending issues related to availability of fronts, payments, contractual issues, if any, etc.

15. **Subcontracting**

The Contractor may, after informing the Employer and getting his written approval, assign or sub-let the Supply Contract or any part thereof other than for raw material, for minor details or for any part of the plant for which makes are identified in the Contract. Suppliers of the equipment not identified in the Contract or any change in the identified suppliers shall be subjected to approval by RECPDCL only. The experience list of equipment vendors under consideration by the Contractor for this Contract shall be furnished to the Project Manager for approval prior to procurement of all such items/equipment.

Field execution of the contract shall not be sub-contracted without written permission of the Employer. On case to case basis, if employer gets satisfied with, permission for sub-contracting entire or part project execution work may be permitted (level-1). However, further sub-letting of field execution works by sub-contractor (Level-2) shall not be acceptable by employer. In case of further sub-letting of contract, it would be construed as non-performance and breach of the contract. Contractual action shall then be initiated as per provisions of the contract.

Such assignment/sub-letting shall not relieve the Contractor of any obligation, duty or responsibility under the Contract.

15.1 The corresponding Appendix (List of Approved Subcontractors) to the Contract Agreement specifies major items of supply or services and a list of approved Subcontractors against each item, including vendors. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval.
in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract.

15.2 For items or parts of the Facilities not specified in the corresponding Appendix (List of Approved Subcontractors) to the Contract Agreement for Supply Contract(s), the Contractor may employ such Subcontractors as it may select, at its discretion.

16. Design and Engineering

16.1 Specifications and Drawings

16.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice.

The Contractor shall be responsible for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications, drawings and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

16.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the Project Manager.

16.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied after approval by the Employer and shall be treated in accordance with GCC Clause 33.

16.3 Approval/Review of Technical Documents by authorized representative of RECPDCL

16.3.1 The Contractor shall prepare (or cause its Subcontractors to prepare) and furnish to the Project Manager the documents listed in Appendix-7 (List of Documents for Approval or Review) to the Contract Agreement for its approval or review as specified and as in accordance with the requirements of GCC Sub-Clause 14.2 (Program of Performance).

Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.

GCC Sub-Clauses 16.3.2 through 16.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

16.3.2 Within twenty one (21) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Sub-Clause 16.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.
16.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good engineering practice.

16.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Sub-Clause 16.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s), and upon resubmission with the required modifications the document shall be deemed to have been approved.

The procedure for submission of the documents by the Contractor and their approval by the Project Manager shall be discussed and finalized with the Contractor.

16.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the parties within a reasonable period, then such dispute or difference may be referred to an Arbitrator for determination in accordance with GCC Sub-Clause 39 hereof. If such dispute or difference is referred to an Arbitrator, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Arbitrator upholds the Contractor's view on the dispute and if the Employer has not given notice under GCC Sub-Clause 39 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Arbitrator shall decide, and the Time for Completion shall be extended accordingly.

16.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.

16.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Sub-Clause 16.3. If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC Clause 33 shall apply to such request.

17. Plant and Equipment

17.1 Transportation

17.1.1 The Contractor shall at its own risk and expense transport all the Plant and Equipment (supplied by turnkey contractor) and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.

17.1.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the Plant and Equipment and the Contractor's Equipment.

17.1.3 Upon dispatch of each shipment of the Plant and Equipment and the Contractor's Equipment, the Contractor shall notify the Employer by e-mail, telex, facsimile or Electronic Data Interchange (EDI) of the description of the Plant and Equipment and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival in the

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country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties.

17.1.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the Plant and Equipment and the Contractor’s Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the Plant and Equipment and the Contractor’s Equipment to the Site.

17.2 Delivery and Documents

17.2.1 Delivery Documents

Upon shipment, the Contractor shall notify the Employer with full details of the dispatch and shall furnish the documents as specified in the corresponding Appendix - 1 (Terms and Procedures of Payment) to the Contract Agreement.

17.2.2 Packing

17.2.2.1 The Contractor shall provide such packing of the Goods as it is required to prevent their damage or deterioration 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 temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods final destination and the absence of heavy handling facilities at all points in transit.

17.2.2.2 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 and, subject to any subsequent instruction ordered by the Employer consistent with the requirements of the Contract.

17.2.3 Materials Handling and Storage:

All the equipment furnished under the Contract and arriving at Site (materials supplied by contractor as well as material free issued by Employer) shall be promptly received, unloaded, transported and stored in the storage spaces by the Contractor. Further, land shall be provided by JKPDD while the bidder shall be responsible for preparation of temporary shed/structure, as required.

Contractor shall be responsible for examining all the shipment and notify the Project Manager immediately of any damages, storage, discrepancy etc, for the purpose of Project Manager’s information only. The Contractor shall submit to the Project Manager every week a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection of the equipment at Site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc, shall be to the account of the Contractor.

The Contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the Project Manager.
Digital Meter Inventory Management:

Bidder should maintain the proper storage and digital record of meters that is in the store/has been installed through Bar code to be maintained by the bidder.

RECPDCL in consultation with JKPDD officials shall prepare documentation as per meter change Protocol of JKPDD including taking photographs of the reading of old meter while changing of meters. Also dismantled meters shall be deposited at Central Store of JKPDD by the bidder.

All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings, etc. shall be used for unloading and/or handling of the equipment without the specific written permission of the Project Manager. The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the store shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at Site.

All electrical panels, control gears, motors and such other devices shall be properly dried by heating before they are installed and energized. Motor bearings, slip ring, commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.

The Contractor shall ensure that all the packing materials and protection devices, used for various equipment during transit and storage, are removed before the equipment are installed.

The consumable and other supplies likely to deteriorate due to storage must be thoroughly protected and stored in a suitable manner to prevent damage or deterioration in quality by storage.

All the materials stored in the open or dusty location must be covered with suitable weatherproof and flame proof covering material wherever applicable.

If the materials belonging to the Contractor are stored in areas other than those earmarked for him, the Project Manager will have the right to get it moved to the area earmarked for the Contractor at the Contractor's cost.

The Contractor shall be responsible for making suitable indoor storage facilities to store all equipment, which require indoor storage. The Project Manager, in addition, may direct the Contractor to move certain other materials, which in his opinion will require indoor storage, to indoor storage areas, which the Contractor shall strictly comply with.

18. Installation

18.1 Setting Out/Supervision/Labor

18.1.1 Bench Mark: The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks and lines provided to it in writing by or on behalf of the Employer.

If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level or alignment of the Facilities, the Contractor shall forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing.
by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

18.1.2 Contractor’s Supervision: The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

18.1.3 Labor:

(a) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.

(b) Unless otherwise provided in the Contract, the Contractor at its own expense shall be responsible for the recruitment, transportation, accommodation and catering of all labor, local or expatriate, required for the execution of the Contract and for all payments in connection therewith.

(c) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors.

(d) The Contractor shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor.

18.2 Contractor’s Equipment

18.2.1 All Contractor’s Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager’s consent that such Contractor’s Equipment is no longer required for the execution of the Contract.

18.2.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

18.2.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor’s Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

18.3 Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer’s approval, which approval shall not be unreasonably withheld.
Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.

18.3.1 Compliance with Labour Regulations

18.3.1.1 During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all applicable existing labour enactments and rules made thereunder, regulations notifications and byelaws of the State or Central Government or local authority and any other labour law (including rules), regulations bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

18.3.1.2 The Contractor shall keep the Project Manager indemnified in case any action is taken against the Contractor by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments.

18.3.1.3 If the Project Manager/Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/ byelaws/Acts/ Rules/regulations including amendments, if any, on the part of the Contractor, the Project Manager shall have the right to deduct any money due to the Contractor under this contract or any other contract with the Project Manager/Employer including his amount of performance security for adjusting the aforesaid payment. The Project Manager shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Project Manager/Employer.

Notwithstanding the above, the Contractor shall furnish to the Project Manager the details/documents evidencing the Contractor’s compliance to the laws applicable to establishments engaged in building and other construction works, as may be sought by the Project Manager. In particular the Contractor shall submit quarterly certificate regarding compliance in respect of provisions of Employees’ Provident Fund and Misc. Provisions Act 1952 or equivalent act of J&K latest to the Project Manager.

18.3.1.4 Salient features of some major laws (or equivalent act/regulation of J&K) mentioned below shall be applicable to establishments engaged in building and other construction works:

(a) Workmen Compensation Act 1923 or latest: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

(b) Payment of Gratuity Act 1972 or latest: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years’ service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

(c) Employee P.F. and Miscellaneous Provision Act 1952 or latest: The Act provides for monthly contribution by the turnkey contractor plus his workers @10% or 8.33%. The benefits under the Act are:

(i) Pension or family pension on retirement or death, as the case may be.
(ii) Deposit linked insurance on death in harness of the worker.
(iii) Payment of P.F. accumulation on retirement/death etc.
(d) Maternity Benefit Act 1951 or latest: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(e) Contract Labour (Regulation & Abolition) Act 1970 or latest: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certification of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.

(f) Minimum Wages Act 1948 or latest: The Contractor is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provision of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

(g) Payment of Wages Act 1936 or latest: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(h) Equal Remuneration Act 1979 or latest: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

(i) Payment of Bonus Act 1965 or latest: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs. 3500/- per month or less. The bonus is to be paid to employees getting Rs. 2500/- per month or above upto Rs. 3500/- per month shall be worked out by taking wages as Rs. 2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act. The above guidelines shall be liable to change with the change in act/notification by relevant statutory authority.

(j) Industrial Dispute Act 1947 or latest: the Act lays down the machinery the procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(k) Industrial Employment (Standing Orders) Act 1946 or latest: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer (i.e. turnkey contractor) on matters provided in the Act and get the same certified by the designated Authority.

(l) Trade Unions Act 1926 or latest: The Act lays down the procedure for registration of trade unions of workmen and contractors. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.


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(n) **Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service Act 1979 or latest: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.**

(o) **The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 or latest and the Cess Act of 1996 or latest: All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The turnkey contractor of the establishment is required to provide safety measures at the electrical construction site, substations, building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The turnkey contractor to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the government.**

(p) **Factories Act 1948 or latest: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.**


18.3.2 **Protection of Environment**

The Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as consequence of his methods of operation.

During continuance of the Contract, the Contractor and his Sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made thereunder, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

Salient features of some of the major laws that are applicable are given below:
The Water (Prevention and Control of Pollution) Act, 1974 or latest, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

The Air (Prevention and Control of Pollution) Act, 1981 or latest, this provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986 or latest, this provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991 or latest, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under Environment (Protection) Act, 1986 or latest, and exceeding such quantity as may be specified by notification by the Central Government.

18.3.3 Safety Precautions

18.3.3.1 The Contractor shall observe all applicable regulations regarding safety on the Site.

Unless otherwise agreed, the Contractor shall, from the commencement of work on Site until Taking Over, provide:

a) Fencing, lighting, guarding and watching of the Works, and

b) Temporary roadways, footways, guards and fences which may be necessary for the accommodation and protection of Employer / his representatives and occupiers of adjacent property, the public and others.

18.3.3.2 The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to Employer or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and the Project Manager, as he may deem necessary.

18.3.3.3 The Contractor will notify well in advance to the Project Manager of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The Project Manager shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Project Manager shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such
prohibition shall be entertained by the Employer and the Employer shall not entertain any claim of the Contractor towards additional safety provisions/conditions to be provided for/constructed as per the Project Manager’s instructions.

Further, any such decision of the Project Manager shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Project Manager, the Contractor shall use alternative methods with the approval of the Project Manager without any cost implication to the Employer or extension of work schedule.

18.3.4 Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934 or latest, Explosives Act, 1948 or latest and Petroleum and Carbid of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Project Manager. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.

18.3.5 All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the Contractor in accordance with manufacturer’s Operation Manual and safety instructions and as per Guidelines/rules of Employer in this regard.

18.3.6 Periodical examinations and all tests for all lifting/hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948 or latest or latest, J&K Electricity Act 2010 and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer-Incharge or by the person authorised by him.

18.3.7 The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractor’s radioactive sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material will be taken by the Contractor.

18.3.8 The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by the Project Manager who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.

18.3.9 Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practice/Rules framed under Indian Explosives Act/ equivalent act of J&K pertaining to handling, storage and use of explosives.

18.3.10 The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall be used by the Contractor.

18.3.11 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by Employer to handle such fuses, wiring or electrical equipment.
18.3.12 Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contractor or Employer, he shall:

a. Satisfy the Project Manager that the appliance is in good working condition;

b. Inform the Project Manager of the maximum current rating, voltage and phases of the appliances;

c. Obtain permission of the Project Manager detailing the sockets to which the appliances may be connected.

18.3.13 The Project Manager will not grant permission to connect until he is satisfied that:

a. The appliance is in good condition and is fitted with suitable plug;

b. The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.

18.3.14 No electric cable in use by the Contractor/Employer will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.

18.3.15 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Project Manager and a permit to work shall be issued by the Project Manager before any repair work is carried out by the Contractor. While working on electric lines/equipment, whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the Contractor to electricians/workmen/officers.

18.3.16 The Contractors shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installation.

18.3.17 The Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen, who will coordinate with the Project Safety Officer. In case of work being carried out through Sub-Contractors, the Sub-Contractor’s workmen/employees will also be considered as the Contractor’s employees/workmen for the above purpose.

The name and address of such Safety Officers of the Contractor will be promptly informed in writing to Project Manager with a copy to Safety Officer-In charge before he starts work or immediately after any change of the incumbent is made during currency of the Contract.

18.3.18 In case any accident occurs during the construction/erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Project Manager in prescribed form and also to all the authorities envisaged under the applicable laws.

18.3.19 The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can,
if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.

18.3.20 The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in GCC Sub-Clause 18.3.3.19 above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.

18.3.21 It is mandatory for the Contractor to observe during the execution of the works, requirements of Safety Rules which would generally include but not limited to following:

Safety Rules

a) Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.

b) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.

c) Under no circumstances shall an employee hurry or take unnecessary chance when working under hazardous conditions.

d) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate firefighting equipment shall be provided at crucial location.

e) Employees under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted to remain at work.

f) There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.

g) The staircases and passageways shall be adequately lighted.

h) The employees when working around moving machinery, must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.

i) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.

j) Requirements of ventilation in underwater working to licensed and experienced divers, use of gum boots for working in slushy or in inundated conditions are essential requirements to be fulfilled.

k) In case of rock excavation, blasting shall invariably be done through licensed blasters and other precautions during blasting and storage/transport of charge material shall be observed strictly.

18.3.22 The Contractor shall follow and comply with all Employer Safety Rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservations. In case
of any discrepancy between statutory requirement and Employer Safety Rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.

18.3.3.23 If the Contractor fails in providing safe working environment as per Employer Safety Rules or continues the work even after being instructed to stop work by the Project Manager as provided in GCC Sub-Clause 18.3.3.19 above, the Contractor shall promptly pay to Employer, on demand by the Employer, compensation at the rate of Rs. 5,000/- per day of part thereof till the instructions are complied with and so certified by the Project Manager. However, in case of accident taking place causing injury to any individual, the provisions contained in GCC Sub-Clause 18.3.3.24 shall also apply in addition to compensation mentioned in this Clause.

18.3.3.24 If the Contractor does not take adequate safety precautions and/or fails to comply with the Safety Rules as prescribed by the Employer or under the applicable law for the safety of the equipment and plant or for the safety of personnel or the Contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other Contractors or Employer’s employees or any other person who are at Site or adjacent thereto, then the Contractor shall be responsible for payment of a sum as indicated below to be deposited with the Employer, which will be passed on by the Employer to such person or next to kith and kin of the deceased:

<table>
<thead>
<tr>
<th>Description</th>
<th>Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Fatal injury or accident causing death</td>
<td>Rs. 1,000,000/- per person</td>
</tr>
<tr>
<td>b. Major injuries or accident causing 25% or more permanent disablement</td>
<td>Rs. 100,000/- per person</td>
</tr>
</tbody>
</table>

Permanent disablement shall have same meaning as indicated in Workmen’s Compensation Act. The amount to be deposited with Employer and passed on to the person mentioned above shall be in addition to the compensation payable under the relevant provisions of the Workmen’s Compensation Act and rules framed there under or any other applicable laws as applicable from time to time. In case the Contractor does not deposit the above mentioned amount with Employer, such amount shall be recovered by Employer from any monies due or becoming due to the Contractor under the contract or any other on-going contract.

18.3.3.25 If the Contractor observes all the Safety Rules and Codes, Statutory Laws and Rules during the currency of Contract awarded by the Employer and no accident occurs then Employer may consider the performance of the Contractor and award suitable ‘ACCIDENT FREE SAFETY MERITORIOUS AWARD’ as per scheme as may be announced separately from time to time.

18.3.3.26 The Contractor shall also submit ‘Safety Plan’ as per proforma specified in Section – Sample Forms and Procedures of the Bidding Documents along with all the requisite documents mentioned therein and as per check-list contained therein to the Project Manager for its approval within 60 days of award of Contract.

Further, one of the conditions for release of first progressive payment / subsequent payment towards Services Contract shall be submission of ‘Safety Plan’ along with all requisite documents and approval of the same by the Project Manager.

18.4 Opportunities for Other Contractors

18.4.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.
18.4.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor’s Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

18.4.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work.

18.4.4 The Contractor shall notify the Project Manager promptly of any defects in the other contractors’ work that come to its notice, and that could affect the Contractor’s work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.

18.5 Emergency Work

If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. In case such work is not in the scope of the Contractor, the cost of such remedial work shall be borne by the Employer.

18.6 Site Clearance

18.6.1 Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor’s Equipment no longer required for execution of the Contract.

18.6.2 Clearance of Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities clean and safe.

18.7 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

18.8 Work at Night and on Holidays
18.8.1 Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the Site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Project Manager, provided that provisions of this GCC Sub-Clause 18.8.1 shall not apply to any work which is customarily carried out by rotary or double-shifts.

18.8.2 Notwithstanding GCC Sub-Claususes 18.8.1 or 18.1.3, if and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Employer’s consent thereto, the Employer shall not unreasonably withhold such consent.

19. Test and Inspection

19.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and Equipment and any part of the Facilities as are specified in the Contract i.e. 1% of the meters. Maximum of 5% of the meters may be tested per annum during O&M Phase.

19.2 The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

19.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give four weeks advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager (or their designated representatives) to attend the test and/or inspection.

19.4 The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection.

If the Employer or Project Manager (or their designated representatives) fails to attend the test and/or inspection, or if it is agreed between the parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.

19.5 The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor’s reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of work on the Facilities and/or the Contractor’s performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.

19.6 If any Plant and Equipment or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant and Equipment or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC Sub-Clause 19.3.

19.7 If any dispute or difference of opinion shall arise between the parties in connection with or arising out of the test and/or inspection of the Plant and Equipment or part of the Facilities that cannot be settled between the parties within a reasonable period of time, it may be referred to an Arbitrator for determination in accordance with GCC Sub-Clause 39.
The Contractor shall afford the Employer and the Project Manager, at the Employer’s expense, access at any reasonable time to any place where the Plant and Equipment are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.

The Contractor agrees that neither the execution of a test and/or inspection of Plant and Equipment or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC Sub-Clause 19.4, shall release the Contractor from any other responsibilities under the Contract.

No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such part of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.

The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Sub-Clause 19.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

Completion of the Facilities and Operational Acceptance

Completion of the Facilities

Physical Completion

As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Technical Specifications, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.

Pre-Commissioning

Within seven (7) days after receipt of the notice from the Contractor under GCC Sub-Clause 20.1.1.1, the Project Manager shall deploy the operating and maintenance personnel and other material if so specified in the corresponding Appendix – 6 (Scope of Works and Supply by the Employer) to the Contract Agreement for Pre-commissioning of the Facilities or any part thereof.

As soon as reasonably practicable after the operating and maintenance personnel have been deployed by the Employer and other materials have been provided by the Employer in accordance with GCC Sub-Clause 20.1.2.1, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof, in presence of the Employer’s representatives, as per procedures detailed in Technical Specifications in preparation for Commissioning.
20.1.2.3 As soon as all works in respect of Pre-commissioning are successfully completed and, in the opinion of the Contractor, the Facilities or any part thereof is ready for Commissioning, the Contractor shall notify the Project Manager in writing.

20.1.2.4 The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 20.1.2.3, notify the Contractor in writing of any defects and/or deficiencies.

20.1.2.5 If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC Sub-Clause 20.1.2.2. If in the opinion of the Contractor, the Facilities or any part thereof is now ready for Commissioning, the Contractor shall again notify the Project Manager in writing. If further defects and/or deficiencies are not notified by the Project Manager and if the Project Manager is satisfied that the Pre-commissioning of Facilities or that part thereof have been successfully completed, the Project Manager shall, within seven (7) days after receipt of the Contractor's such notice, advise the Contractor to proceed with the Commissioning of the Facilities or part thereof.

20.1.2.6 If the Project Manager fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 20.1.2.4 or within seven (7) days after receipt of the Contractor's notice on completion of repeat procedure under GCC Sub-Clause 20.1.2.5, then the Pre-commissioning of the Facilities or that part thereof shall be considered to have been successfully completed as of the date of the Contractor's notice.

20.1.2.7 As soon as possible after Pre-commissioning, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.

20.1.2.8 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 20.1.2 for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the following provisions shall apply:

When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above GCC Sub-Clause 20.1.2.8, the Contractor shall be entitled to the following:

a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Sub-Clause 21.2.

b) payments due to the Contractor in accordance with the provisions specified in Appendix I (Terms and Procedures of Payment) to the Contract Agreement, which would have not been payable in normal circumstances due to non-completion of the said activities and obligations, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding these payments, subject to the provisions of GCC Sub-Clause 21.2.9 below.

c) the expenses payable by the Contractor to the Bankers toward the extension of above security and extension of other securities under the Contract, of which validity need to be extended, shall be reimbursed to the Contractor by the Employer against documentary evidence.
d) the additional charges toward the care of the Facilities pursuant to GCC Sub-Clause 28.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in GCC Sub-Clause 20.1.2.10 below. The provisions of GCC Sub-Clause 29.2 shall apply to the Facilities during the same period.

20.1.2.9 In the event that the period of suspension under GCC Sub-Clause 20.1.2.8 actually exceeds one hundred eighty (180) days, the Employer and the Contractor shall mutually agree to any additional compensation payable to the Contractor.

20.1.2.10 As and when, after the period of suspension under GCC Sub-Clause 20.1.2.8, the Contractor is notified by the Project Manager that the Facilities are ready for Pre-commissioning, the Contractor shall proceed without delay in performing all activities and obligations under the Contract.

20.1.3 Commissioning

20.1.3.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after being advised by the Project Manager, pursuant to GCC Sub-Clause 20.1.2.5 or immediately after the Pre-commissioning is considered to be completed under GCC Sub-Clause 20.1.2.6.

20.1.3.1.1 Commissioning of the Facilities or any part thereof shall be completed by the Contractor as per procedures detailed in bid documents.

20.1.3.2 Deleted.

20.1.3.3 In the event that the Contractor is unable to proceed with the Commissioning of the Facilities pursuant to Sub-Clause 20.1.3 for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions of GCC Sub-Clause 20.1.2.8 to 20.1.2.9 shall apply.

20.1.3.4 As and when, after the period of suspension under GCC Sub-Clause 20.1.2.8, the Contractor is notified by the Project Manager that the Facilities are ready for Commissioning, the Contractor shall proceed without delay in performing all activities and obligations under the Contract.

20.1.4 Trial - Operation

20.1.4.1 Trial – Operation of the Facilities or any part thereof shall be commenced by the Contractor immediately after the Commissioning is completed pursuant to GCC Sub-Clause 20.1.3.1.1.

20.1.4.2 Trial – Operation of the Facilities or any part thereof shall be completed by the Contractor for the period specified in Technical Specification (or for a continuous period of 24 hours where such period in not specified in Technical Specification) and as per procedures detailed in Technical Specifications.

20.1.4.3 At any time after the events set out in GCC Sub-Clause 20.1.4.2 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Taking Over Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

20.1.4.4 The Project Manager shall within twenty-one (21) days after receipt of the Contractor's notice, issue an Taking Over Certificate.
20.1.5.1 Upon successful Trial – Operation of the Facilities or any part thereof, pursuant to GCC Sub-Clause 20.1.4, the Project Manager shall issue to the Contractor a Taking Over Certificate as a proof of the acceptance of the Facilities or any part thereof. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of Contract after issue of such certificate.

20.1.5.2 If within twenty one (21) days after receipt of the Contractor's notice, the Project Manager fails to issue the Taking Over Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Taking Over Certificate, the Facilities or the relevant part thereof shall be deemed to have been Taken Over as at the date of the Contractor's said notice.

20.1.5.3 Upon Taking Over of the Facilities or any part thereof, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

20.2 Operational Acceptance

20.2.1 Guarantee Test

20.2.1.1 The Guarantee Test (and repeats thereof), if any specified in the SCC and/or the Technical Specification, shall be conducted by the Contractor after successful Trial – Operation of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Contract Documents or if otherwise required as per the Technical Specifications. The Contractor's and Project Manager's advisory personnel may witness the Guarantee Test. The Contractor shall promptly provide the Employer with such information as the Employer may reasonably require in relation to the conduct and results of the Guarantee Test (and any repeats thereof).

20.2.1.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the time stipulated in the Technical Specifications the period for completing the same shall be as agreed upon by the Employer and the Contractor.

20.2.2 Operational Acceptance

20.2.2.1 Operational Acceptance shall occur in respect of the Facilities or any part thereof as mentioned below:

(I) In case no Functional Guarantees are applicable, Operational Acceptance shall occur when the Facilities or part thereof have been successfully Commissioned and Trial – Operation for the specified period have been successfully completed

(II) In case Functional Guarantees are applicable, Operational Acceptance shall occur when the Functional Guarantees are met or the Contractor has paid liquidated damages specified in GCC Sub-Clause 23.3 hereof; or

20.2.2.2 At any time after any of the events set out in GCC Sub-Clause 20.2.2.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

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20.2.2.3 The Project Manager shall within seven (7) days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate.

20.2.2.4 Upon Operational Acceptance, pursuant to GCC Sub-Clause 20.2.2.2, the Project Manager shall issue to the Contractor a Operational Acceptance Certificate as a proof of the final acceptance of the Plant and Equipment. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of Contract after issue of such certificate.

20.2.2.5 If within fourteen (14) days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as at the date of the Contractor's said notice.

20.3 Partial Acceptance

20.3.1 If the Contract specifies that Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Commissioning including the Trial – Operation and Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.

20A. Quantity Variation

I. The quantity of all equipment/materials given in the Price Schedules of the bidding documents are provisional. The variation in quantity shall be limited to plus/minus (+/-) thirty percent (30%) for the individual items, total variations in all items under the contract shall be limited to ten percent (10%) of the contract price. For quantity variation of the individual items beyond twenty percent (20%), the matter shall be referred to the Employer for mutually agreed rates.

II. However, in case of highly quoted rate of individual item as compared to its estimated cost, efforts shall be made so that no positive deviation in quantity during execution shall be permitted to its award quantity. However, in case, deviations are found inevitable, present market rate analysis of the item shall be made.

III. The Contractor shall be responsible for supply and execution of such final quantities for completion of the project and they shall be paid for such finalized quantity within plus ten percent (+) 10% overall deviation limit.

20B. Electrical Inspector inspection:

After successful completion of the work permission from State Electrical Inspectorate is required. Necessary fee etc. shall be paid by the Employer. It shall be responsibility of the contractor to obtain such permissions on his own cost.

Defects / in-complete works notified by Electrical Inspectorate shall be completed by the agency at no extra cost implication to Employer.

F. Guarantees and Liabilities

21. Completion Time Guarantee
21.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified in the SCC) within the Time for Completion specified in the SCC pursuant to GCC Sub-Clause 4.2, or within such extended time to which the Contractor shall be entitled under GCC Clause 34 hereof.

21.2 If the Contractor fails to comply with the Time for Completion in accordance with Clause GCC 21 for the whole of the facilities, (or a part for which a separate time for completion is agreed) then the Contractor shall pay to the Employer a sum equivalent to half percent (0.5%) of the Contract Price for a part for which a separate time for completion is agreed as liquidated damages for such default and not as a penalty, without prejudice to the Employer's other remedies under the Contract, for each week or part thereof which shall elapse between the relevant Time for Completion and the date stated in Taking Over Certificate of the whole of the Works (or a part for which a separate time for completion is agreed) subject to the limit of five percent (5%) of Contract Price for a part for which a separate time for completion is agreed. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

21.3 No bonus will be given for earlier Completion of the Facilities or part thereof.

21A. Pre-dispatch Inspection:

Pre-dispatch inspection shall be performed on various materials at manufacturer's work place for which contractor shall be required to raise requisition giving at least 10-day time. Depending on requirement, inspection shall be witnessed by representatives of Employer, TPIA and/or REC/PFC/MoP.

The contractor shall ensure receipt of material at site within 21 days from date of receipt of dispatch instructions. In case materials are not received within 21 days from date of issue of dispatch instruction, the dispatch instruction shall stand cancelled. All expenditure incurred by Employer in performance of dispatch instruction shall be recovered from turnkey contractor.

The turnkey contractor shall ensure that pre-dispatch inspection for materials are intimated only when the material is completely ready for inspection. On due date of inspection, if it is found that materials are not ready in required quantities or the inspection could not be carried out due to non-availability of requisite calibrated certificate of instruments with manufacturer, closing of works on scheduled date of inspection, non-availability of sufficient testing/material handling staff at manufacturer works etc, all expenditures incurred on deployment of various inspecting officials along with a fine of Rs 50,000/- shall be recovered from the bills of the agency and re-inspection shall be carried out on expense of contractor. 2nd such situation at same manufacturer/supplier shall result in rejection of name of manufacturer from list of approved vendors/sub-vendors. In case sub-standard materials (old component, recycled materials, re-used core material, re-used transformer coil material etc) offered for inspection and are noticed during the inspection, materials shall be rejected and approval of sub-vendor shall also be cancelled for all IPDS/PMDP projects.

22. Defect Liability

22.1 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed.
22.1.1 Volume of concreting: If it was observed by employer, quality monitoring agencies and/or REC/MoP that volume and quality of concreting used in foundation of support, equipment foundation, gantry structure foundation, stay set etc. are not as per requirement specified in the scope of work/technical specifications, the contractor has to dismantle the supports, foundation and redo the concreting of all the supports in that particular section of line/redo all the foundations in that particular substation at his own cost. To ensure this, the employer reserves the right to withhold the payment of contractor for such defective works till such time the contractor conforms to scope of works, technical specification and tender drawings.

22.1.2 NA.

22.1.3 NA.

22.2 The Defect Liability Period shall be **Twelve (12) months** from the date of Taking Over. If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

(a) improper operation or maintenance of the Facilities by the Employer

(b) operation of the Facilities outside specifications provided in the Contract

22.3 The Contractor’s obligations under this GCC Clause 22 shall not apply to

(a) any materials that are supplied by the Employer under GCC Sub-Clause 17.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein

(b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein

(c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC Sub-Clause 22.7.

22.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

22.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC Clause 22. The Contractor may, with the consent of the Employer, remove from the Site any Plant and Equipment or any part of the Facilities that are defective in the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

22.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring
that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good (as the case may be) until that part of the Facilities passes such tests.

22.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.

22.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

Upon correction of the defects in the Facilities or any part thereof by repair/replacement, such repair/replacement shall have the Defect Liability Period extended by a period mentioned in GCC Sub-Clause 22.2 from the time of such replacement/repair of the facilities or any part thereof.

22.8.1 At the end of the Defect Liability Period, the Contractor’s Liability ceases except for latent defects. The Contractor's liability for latent defects warranty shall be limited to period of ten (10) years from the end of Defect Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency, which do not manifest themselves during the Defect Liability Period defined in this GCC Clause 22, but later.

22.9 Except as provided in GCC Clauses 22 and 29, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant and Equipment, design or engineering or work executed that appear after Defect Liability Period except for the liability towards obligations that may survive in terms of the Contract after Defect Liability Period, except where such defects are the result of the gross negligence, fraud, criminal or willful action of the Contractor.

23. Functional Guarantees

23.1 The Contractor guarantees that the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Technical Specifications, subject to and upon the conditions therein specified.

23.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in the Technical Specifications are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and / or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract pursuant to GCC Sub-Clause 36.2.2 and recover the payments already made to the Contractor.

23.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Technical Specifications are not attained either in whole or in part, but the minimum level of the Functional Guarantees...
Guarantees specified in the Technical Specifications is met, the Contractor shall, at the Contractor’s option, either

(a) make such changes, modifications and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense within a mutually agreed time and shall request the Employer to repeat the Guarantee Test, or

(b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in the SCC.

23.4 In case the Employer exercises its option to accept the equipment after levy of liquidated damages, the payment of liquidated damages under GCC Sub-Clause 23.3, up to the limitation of liability specified in the SCC, shall completely satisfy the Contractor’s guarantees under GCC Sub-Clause 23.3, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.

24. Equipment Performance Guarantees

24.1 The Contractor guarantees that the Equipment, named in the SCC, shall attain the rating and performance requirements specified in Appendix – 8 (Guarantees, Liquidated Damages for Non-Performance) to the Contract Agreement, subject to and upon the conditions therein specified.

24.2 If the guarantees specified in Appendix – 8 (Guarantees, Liquidated Damages for Non-Performance) to the Contract Agreement are not established, then the Employer shall reject the equipment.

24.3 In case the Employer rejects the equipment, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the equipment or any part thereof as may be necessary to meet the specified guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Test until the level of the specified guarantee has been met.

24.4 Whenever the Employer exercises its option to accept the equipment after levy of liquidated damages, the payment of liquidated damages under GCC Sub-Clause 24.2, up to the limitation of liability specified in the SCC, shall completely satisfy the Contractor’s guarantees under GCC Sub-Clause 24.2, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof.

25. Patent Indemnity

25.1 The Contractor shall, subject to the Employer’s compliance with GCC Sub-Clause 25.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney’s fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.
Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.

25.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GCC Sub-Clause 25.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer’s name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor’s request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

25.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney’s fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Employer.

26. Limitation of Liability

26.1 Except in cases of gross negligence or willful misconduct,

(a) the Contractor and the Employer shall not be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and

(b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

26.2 All payments to subcontractor shall be made by contractor. Contractor shall indemnify Employer from any legal issues related to delay in payment or not making any payment to sub-vendor/sub-contractor.

G. Risk Distribution

27. Transfer of Ownership
27.1 Imported finished items are not covered under the contract. Only indigenous finished items are covered under the contract.

27.2 Ownership of the Plant and Equipment (including spare parts) procured in India, shall be transferred to the Employer upon loading on to the mode of transport to be used to carry the Plant and Equipment from the works to the site and upon endorsement of the dispatch documents in favour of the Employer.

27.3 Ownership of the Contractor’s Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.

27.4 Ownership of any Plant and Equipment in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant and Equipment in question are no longer required for the Facilities provided quantity of any Plant and Equipment specifically stipulated in the Contract shall be the property of the Employer whether or not incorporated in the Facilities.

27.5 Notwithstanding the transfer of ownership of the Plant and Equipment, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC Clause 28 (Care of Facilities) hereof until Completion of the Facilities and Taking Over pursuant to GCC Clause 20 or the part thereof, if any, as per GCC Sub-Clause 1.1(e) in which such Plant and Equipment are incorporated.

28. Care of Facilities

28.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Taking Over Certificate pursuant to GCC Clause 20 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC Clause 22. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by any use or occupation by the Employer or any third party (other than a Subcontractor) authorized by the Employer of any part of the Facilities.

29. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

29.1 The Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney’s fees and expenses, in respect of the death or injury of any person or loss of or damage to any property (other than the Facilities whether accepted or not), arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.

29.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer’s name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to
conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor’s request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

29.3 Notwithstanding anything in this Contract to the contrary, it is agreed that neither the Contractor nor the Employer shall be liable to the other party for loss of production, loss of profit, loss of use or any other indirect or consequential damages.

30. Insurance

30.1 To the extent specified in the corresponding Appendix-3 (Insurance Requirements) to the Contract Agreement, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

(a) Marine Cargo Policy/Transit Insurance Policy:

(I)(i) Marine Cargo policy for imported equipment

Since imported finished materials are not permitted under the contract, this policy shall not be applicable,

(I)(ii) Transit Insurance Policy for indigenous equipment

Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment supplied from within India. The policy shall cover movement of Plant and Equipment from the manufacturer’s works to the project’s warehouse at final destination site. Inland Transit Clause (ITC) ‘A’ along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken. The policy shall cover movement of Plant and Equipment from the manufacturer’s works to the project’s warehouse at final destination site. The policy shall cover all risk for loss or damage that may occur during transit of Plant and Equipment from the Contractor/sub-Contractor’s works or stores until arrival at project’s warehouse/ store at final destination. Institute Cargo Clause (ICC) ‘A’ along with war & Strike Riots & Civil Commotion (SRCC) cover shall be taken.

(II) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(III) The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if
the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.

(b) Erection All Risk Policy/Contractor All Risk Policy:

(I) The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.

(II) The Contractor shall take the policy in the joint name of Employer and the Contractor. All these policies shall indicate Employer as the beneficiary. The policy shall be kept valid till the date of the Operational Acceptance of the project and the period of the coverage shall be determined with the approval of the Employer.

If the work is completed earlier than the period of policy considered, the Contractor shall obtain the refund as per provisions of the policy and pass on the benefit to Employer. In case no refund is payable by the insurance company then the certificate to that effect shall be submitted to Employer at the completion of the project.

(III) The following add-on covers shall also be taken by the Contractor:

i) Earthquake

ii) Terrorism

iii) Escalation cost (approximately @10% of sum insured on annual basis)

iv) Extended Maintenance cover for Defect Liability Period

v) Design Defect

vi) Other add-on covers viz., 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than 100 crores, cover for offsite storage/fabrication (over 100 crores).

(IV) Third Party Liability cover with cross Liability within Geographical limits of India as on ADD-on cover to the basic EAR cover:

The third party liability add-on cover shall cover bodily injury or death suffered by third parties (including the Employer’s personnel) and loss of or damage to property (including the Employer’s property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with supply and installation of the Facilities.

(V) As per para 30.8 below, the cost of insurance premium is to be reimbursed to the Contractor for Employer Supplied Materials (OSM) for which the insurer is to be finalized by the Contractor as detailed therein. Alternatively, the Contractor may take a single policy covering the entire cost of the project including the cost of OSM. For this purpose, the Contractor shall submit documentary evidence for the premium paid for the entire project to the Employer and Employer shall
reimburse to the Contractor the proportion of premium equal to value of OSM to total sum insured.

(VI) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(c) Automobile Liability Insurance

The Contractor shall ensure that all the vehicles deployed by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its Subcontractors may also take comprehensive policy (own damage plus third party liability) of each individual vehicles deployed in the project on their own discretion in their own name to protect their own interest.

(d) Workmen Compensation Policy:

(I) Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its Subcontractors for the project are adequately covered under the policy.

(II) The policy may either be project specific covering all men of the Contractor and its Subcontractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing ‘Workmen Compensation Policy’ for all its employees including that of the Subcontractor(s), the Contractor must include the interest of the Employer for this specific Project in its existing ‘Workmen Compensation Policy’.

(III) Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal’s statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its Subcontractors shall effect and maintain insurance on the same basis as the ‘Workmen Compensation Policy’ effected by the Contractor.

(e) Contractor’s Plant and Machinery (CPM) Insurance

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor’s Equipment or for any losses, liabilities, costs, claims,
actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

30.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1, except for the Third Party Liability, Workmen Compensation Policy Insurances, and the Contractor’s Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1 except for the Cargo Insurance During Transport, Workmen Compensation Policy Insurances. All insurer’s rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

30.3 The Contractor shall, in accordance with the provisions of the corresponding Appendix – 3 (Insurance Requirements) to the Contract Agreement, deliver to the Employer certificates of insurance (or copies of the insurance policies) as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days’ notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy.

30.4 The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.

30.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the corresponding Appendix – 3 (Insurance Requirements) to the Contract Agreement, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor’s Subcontractors shall be named as co-insureds under all such policies. All insurers’ rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days’ notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GCC Sub-Clause 30.5.

30.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Sub-Clause 30.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GCC 30.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer.

30.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC Clause 30, and the monies payable by any insurers under all the insurance except Third Party Liability Insurance and Workmen Compensation Policy, shall be paid to the joint account of the Employer and the Contractor as mutually agreed and such amounts paid shall be apportioned between the Employer and the Contractor in accordance with the respective responsibilities under the Contract. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the
Contractor’s interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.

30.8 Further all equipment and materials being supplied by Employer for the erection (as per Technical Specification) shall be kept insured by the Contractor against any loss, damage, pilferage, theft, fire, etc. from the point of unloading up to the time of taking over by Employer including handling, transportation, storage, erection, testing and commissioning etc. The premium paid to the Insurance company by the Contractor for such insurance shall be reimbursed by Employer to the Contractor. The Contractor shall obtain competitive quotation for such insurance and shall take prior approval from Employer before taking the insurance. The insurable value of the equipment being supplied by Employer shall be intimated to the Contractor for arranging the insurance.

30.9 It will be the responsibility of the Contractor to lodge, pursue and settle all claims with the insurance company in case of any damage, loss, theft, pilferage or fire during execution of Contract and Employer shall be kept informed about it. The Contractor shall replace the lost/damaged materials promptly irrespective of the settlement of the claims by the underwriters and ensure that the work progress is as per agreed schedules. The losses, if any, in such replacement will have to be borne by the Contractor.

31. Change in Laws and Regulations

31.1 If, after the date seven (07) days prior to the date of Bid Opening, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed in India (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. However, these adjustments would be restricted to direct transactions between the Employer and the Contractor and not on procurement of raw materials, intermediary components etc. by the Contractor for which the Employer shall be the sole judge. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the Appendix-2 to the Contract Agreement.

32. Force Majeure

32.1 “Force Majeure” shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:

(a) war, hostilities or warlike operations (whether war be declared or not), invasion, act of foreign enemy and civil war,

(b) rebellion, revolution, insurrection, mutiny, usurpation of government, conspiracy, riot and civil commotion,

(c) earthquake, landslide, volcanic activity, flood or cyclone, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster,

32.2 Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligation is prevented by any circumstances of Force majure, which arises after date of Notification of Award.
32.3 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

32.4 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GCC Clause 34.

H. Change in Contract Elements

33. Change in the Facilities

33.1 Introducing a Change

33.1.1 Subject to GCC Sub-Clause 33.2.5, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities (hereinafter called "Change"), provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.

33.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer (with a copy to the Project Manager) any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure the safety of the Facilities.

33.1.3 Changes made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall not be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.

33.1.4 The procedure on how to proceed with and execute Changes is specified in GCC Sub-Clauses 33.2 and 33.3.

33.2 Changes Originating from Employer

33.2.1 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the parties thereto shall agree on specific rates for the valuation of the Change.

33.2.2 The Contract Price for (i) the items for which quantities have been indicated as lumpsum or lot or set and/or (ii) where the quantities are to be estimated by the Contractor shall remain constant unless there is change made in the Scope of Work by Employer. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ)/Billing breakup of lumpsum quantities/lot/Set and/or (ii) estimated by the Contractor shall be for on account payment purpose only. In case additional quantities, over and above the quantities in BOQ/billing breakup and/or estimated by the Contractor, are required for successful completion of the scope of work as per Technical Specification, the Contractor shall execute additional quantities of these items for which no additional payment shall be made over and above the lumpsum Contract Price. In case quantities of these items supplied at site are in excess of that required for successful completion
of scope of work, such additional quantities shall be the property of the Contractor and they shall be allowed to take back the same from the site for which no deduction from the lumpsum Contract Price shall be made. Further, in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ/billing breakup and/or estimated by the Contractor, the lumpsum contract price shall remain unchanged and no deduction shall be made from the lumpsum price due to such reduction of quantities.

It shall be the responsibility of the Contractor to pay all statutory taxes, duties and levies to the concerned authorities for such surplus material which would otherwise have been, lawfully payable in case of non-deemed export contracts. The Contractor shall submit an indemnity bond to keep Employer harmless from any liability, before release of such material to the Contractor by Employer.

Set/Lot/Lumpsum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications and the Billing breakup referred to above shall be issued by the Employer based on Contractor’s request, if and as may be required during the currency of the Contract.

33.2.3 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GCC Clause 33 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement by more than the percentage specified in SCC, the Employer and the Contractor shall mutually agree on specific rates for valuation of the Change beyond the specified percentage.

For the said purpose, the Contract Price means the Contract Price of the Facilities notwithstanding the Construction of the Contract.

33.2.4 If rates and prices of any change are not available in the Contract, the parties thereto shall agree on specific rates for the valuation of the change and all matters therein related to the change. Based on the same, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.

33.2.5 The Employer shall issue the Contractor with a Change Order pursuant to GCC Sub-Clause 33.2 by way of amendment to the Contract or in any other manner deemed appropriate. Even if the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters related to the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a “Pending Agreement Change Order” (“Pending Agreement Amendment”).

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal.

If the parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Arbitrator in accordance with the provisions of GCC Clause 38 & 39.

33.3 Changes Originating from Contractor

33.3.1 If the Contractor proposes a Change pursuant to GCC Sub-Clause 33.1.2, the Contractor shall submit to the Project Manager a written "Request for Change Proposal", giving reasons for the proposed Change and which shall include the following:
(a) brief description of the Change  
(b) effect on the Time for Completion  
(c) estimated cost of the Change  
(d) effect on Functional Guarantees (if any)  
(e) effect on any other provisions of the Contract.

Upon receipt of the Request for Change Proposal, the parties shall follow the procedures outlined in GCC Sub-Clauses 33.2.1 and 33.2.5. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Request for Change Proposal.

33A. Surplus Materials

a. On completion of the works all such materials supplied by contractor for erection that remain unutilized, if any, shall be taken back by Contractor after detailed materials and payment reconciliations.

b. The Contractor, within two (2) months from the taking over of the equipment/ materials under the package, shall submit payment and materials account for the reconciliations, failing which necessary recoveries will be made from the outstanding bills of the Contractor for the cost of the materials left unaccounted as decided by the Project Manager.

34. Extension of Time for Completion

34.1 The Time(s) for Completion specified in the SCC shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

(a) any Change in the Facilities as provided in GCC Clause 33  
(b) any occurrence of Force Majeure as provided in GCC Clause 32  
(c) any suspension order given by the Employer under GCC Clause 35 hereof or reduction in the rate of progress pursuant to GCC Sub-Clause 35.2 or  
(d) any changes in laws and regulations as provided in GCC Clause 31 or  
(e) any other matter specifically mentioned in the Contract

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

34.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer’s estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter to Arbitration, pursuant to GCC Sub-Clause 39.
34.3 The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

35. Suspension

35.1 The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons therefor. The Contractor shall thereupon suspend performance of such obligation (except those obligations necessary for the care or preservation of the Facilities) until ordered in writing to resume such performance by the Project Manager.

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor’s default or breach of the Contract, the Contractor’s performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GCC Clause 33, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC Clause 33 or, where it affects the whole of the Facilities, as termination of the Contract under GCC Sub-Clause 36.1.

35.2 If the Contractor’s performance of its obligations is suspended or the rate of progress is reduced pursuant to this GCC Clause 35, then the Time for Completion shall be extended in accordance with GCC Sub-Clause 34.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor’s default or breach of the Contract.

35.3 During the period of suspension, the Contractor shall not remove from the Site any Plant and Equipment, any part of the Facilities or any Contractor’s Equipment, without the prior written consent of the Employer.

36. Termination

36.1 Termination for Employer’s Convenience

36.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GCC Sub-Clause 36.1.

36.1.2 Upon receipt of the notice of termination under GCC Sub-Clause 36.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below
(c) remove all Contractor’s Equipment from the Site, repatriate the Contractor’s and its Subcontractors’ personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition.

(d) In addition, the Contractor, subject to the payment specified in GCC Sub-Clause 36.1.3, shall

(i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

(ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant and Equipment as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors

(iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities.

36.1.3 In the event of termination of the Contract under GCC Sub-Clause 36.1.1, the Employer shall pay to the Contractor the following amounts:

(a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination

(b) the costs reasonably incurred by the Contractor in the removal of the Contractor’s Equipment from the Site and in the repatriation of the Contractor’s and its Subcontractors’ personnel

(c) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges

(d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Sub-Clause 36.1.2

(e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

36.2 Termination for Contractor’s Default

36.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this GCC Sub-Clause 36.2:

(a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt

(b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 37.
(c) if the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

(d) If the contractor fails to achieve mutually agreed deadline (as set in mutually agreed Project Execution Plan/PERT chart) for consecutive 3 months, Employer shall issue contract termination notice giving suitable time to contractors which may be up to time agreed between employer and contractor. In case, contractor does not improve its performance as per contract termination notice, which shall be within overall plan under mutually agreed project execution plan, employer will terminate the contract and encash performance securities.

For the purpose of this Sub-Clause:

"corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

"fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

"collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

"coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

"obstructive practice” is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Employer’s investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation;

or

(bb) acts intended to materially impede the exercise of the Employer’s inspection and audit rights.

In persuasions of its policy, the Employer will sanction a firm or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a contract.

36.2.2 If the Contractor

(a) has abandoned or repudiated the Contract

(b) has without valid reason failed to commence work on the Facilities promptly or has suspended (other than pursuant to GCC Sub-Clause 35.2) the progress of Contract
performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed

(c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause

(d) refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the program furnished under GCC Sub-Clause 14.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended, then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GCC Sub-Clause 36.2.

36.2.3 Upon receipt of the notice of termination under GCC Sub-Clauses 36.2.1 or 36.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

(a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below

(c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

(d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant and Equipment as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors

(e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities.

36.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer’s use of such equipment, any Contractor’s Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor’s Equipment will be returned to the Contractor at or near the Site and shall return such Contractor’s Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

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36.2.5 Subject to GCC Sub-Clause 36.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant and Equipment on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Sub-Clause 36.2.3. Any sums due to the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

36.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined.

If the sum that the Contractor is entitled to be paid, pursuant to GCC Sub-Clause 36.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price or the entire Facilities if entire Facilities have been completed or the price for part of the Facilities if part of the Facilities have been completed, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GCC Sub-Clause 36.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due the Contractor under GCC Sub-Clause 36.2.5, the Employer shall pay the balance to the Contractor. For facilitating such payment the Employer shall encash the Bank Guarantees of the Contractor available with the Employer and retain such other payments due to the Contractor under the Contract in question or any other Contract that the Employer may have with the Contractor.

The Employer and the Contractor shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.

36.3 In this GCC Clause 36, the expression "Facilities executed" shall include all work executed, Installation Services provided, and all Plant and Equipment acquired (or subject to a legally binding obligation to purchase) by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

36.4 In this GCC Clause 36, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the corresponding Appendix (Terms and Procedures of Payment) to the Contract Agreement.

37. Assignment

37.1 Neither the Employer nor the Contractor shall, without the express prior written consent of the other party (which consent shall not be unreasonably withheld), assign to any third party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder, except that the Contractor shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

I. Resolution of Disputes

38. Settlement of Disputes

38.1 If any dispute of any kind whatsoever shall arise between the Employer and the Contractor in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the execution of the Facilities, whether during the progress of the Facilities or after their completion and whether
before or after the termination, abandonment or breach of the Contract, the parties shall seek to resolve any such dispute or difference, to the extent possible, amicably by mutual consultation.

38.2 If the parties fail to resolve such a dispute or difference by mutual consultation at the execution site level, then the dispute shall be referred by the Contractor to the Project Manager, who, within a period of thirty (30) days after being requested by Contractor to do so, shall give written notice of his decision.

38.2.1 The decision/instruction of the Project Manager shall be deemed to have been accepted by the Contractor unless notified by the Contractor of his intention to refer the matter for Arbitration within thirty (30) days of such decision/instruction.

38.2.2 In the event the Project Manager fails to notify his decision as aforesaid within thirty (30) days, the Contractor, if he intends to go for Arbitration, shall notify his intention to the Project Manager within 30 days of expiry of the first mentioned period of thirty days failing which it shall be deemed that there are no dispute or difference between the Employer and the Contractor.

38.3 In case of dispute or difference between the Employer and the Contractor, if the Employer intends to go for Arbitration, he shall notify such intention to the Contractor.

39. **Arbitration**

39.1 All disputes or differences in respect of which the decision, if any, of the Project Manager and/or the Head of the Implementing Authority has not become final or binding as aforesaid shall be settled by arbitration in the manner provided herein below:

39.2 The arbitration shall be conducted by three arbitrators, one each to be nominated by the Contractor and the Employer and the third to be appointed by both the arbitrators in accordance with the J&K Arbitration and Conciliation Act, 1997. If either of the parties fails to appoint its arbitrator within sixty (60) days after receipt of a notice from the other party invoking the Arbitration clause, the arbitrator appointed by the party invoking the arbitration clause shall become the sole arbitrator to conduct the arbitration.

39.3 The language of the arbitration proceedings and that of the documents and communications between the parties shall be English. The arbitration shall be conducted in accordance with the provisions of the J&K Arbitration and Conciliation Act, 1997 or any statutory modification thereof. The venue of arbitration shall be headquarter of Employer.

39.4 The decision of the majority of the arbitrators shall be final and binding upon the parties. In the event of any of the aforesaid arbitrators dying, neglecting, resigning or being unable to act for any reason, it will be lawful for the party concerned to nominate another arbitrator in place of the outgoing arbitrator.

39.5 During settlement of disputes and arbitration proceedings, both parties shall be obliged to carry out their respective obligations under the Contract.

40. **Criterion for Fresh Vendor approval:**

1. The firm should be a reputed manufacturer, who have consistent and successful record of supplying identical/similar or higher sized equipment/materials to the power utilities of India for last three years.

2. The firm has not been debarred/blacklisted by any power utilities of State or Central Govt.

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3. GTP of material must comply with the latest GTP of JKPDD/REC.

4. The GTP and Drawings will be approved in light of the technical specifications and only after submission of valid type test reports.

41. **Turnkey contractor’s Store at Project site:**

“Project wise separate Site Stores shall be maintained and manned by turnkey contractor. Same store shall not be used for more than one projects even if neighboring districts’ projects are awarded to the same agency. The turnkey contractor shall deploy his own manpower in stores for round the clock security and for its day to day operation through trained Store-keeper. The land for the store shall be provided by JKPDD, however the requisite civil constructions need to be done by the bidder.

Since materials received in this stores are owned by Employer (including owner’s free issued material) and are pre-dispatch inspected by Employer’s representative, materials in a lot shall not be issued to the sub-contractor for physical execution by turnkey contractor. Instead, day to day requirements shall be issued to the working teams of sub-vendors by authorized store-keeper. In exceptional cases, on prior written permission of Employer, materials for a week time may be issued to working team of sub-vendor. Daily accounting of materials receipt, materials issues, materials in custody of sub-vendors are to be maintained by turnkey contractor. Handing of Stores shall, in no circumstances, be off loaded.

In no case, inter-project transfer of materials shall be permitted.

42. **Handing over of assets:**

On completion of erection and testing of a section of RF Canopy, Smart Meter etc. agency shall submit digital photographs in soft copies of each and every support structures along-with submission of completion report in support of their claim for completion of installation. Project Manager within a week time, shall review the photographs for acceptance of quality of works and shall immediately deploy officials for joint measurement and inspection of executed works for energisation.

43. **Supply of Materials in lots:**

Item wise mobilization of materials shall be planned in lots. Employer shall arrange pre-dispatch inspections for lots at his own expenditure. However, in case of approved quantity variation, employer may consider to increase the number of Lots.

44. **Contract Closing:**

On completion of handing over formality and successfully completion of defect liability / guarantee period, the contract shall be closed on completion of following formality:

I. Material reconciliation of owner free issued materials as well as material supplied by turnkey contractor,

II. Payment reconciliations, submission and verifications that reconciliation of payment toward statutory provisions like GST, Entry Tax, any other dues etc. Reconciliation statement shall be verified and vetted by chartered accountant.

III. Approval for extension of Completion period, with or without compensation, as required.

IV. Certification from agency regarding payment of dues to its
General Conditions of Contract (GCC)

i. Sub-vendors
ii. Workers/contract laborers,
iii. Payment of statutory dues toward Provident Funds, wages etc as required.

V. Certification of Project Manager & agency to the effect that erection, testing and commissioning of the equipment have been completed as per specifications laid down in the contract and defects noted at the time of commissioning and notified to the agency have been liquidated to the satisfaction of Employer.

VI. Removal of construction meant for site stores, hutment, labour colony etc. in the premises of EMPLOYER.

VII. Certificate from Project Manager in charge regarding final amendment of drawings and detailed of such amendments,

VIII. Drawing receipt certificate by the Project Manager,

IX. Receipt of compliance report on Quality Assurance Mechanism along with photograph, Assurance documents by Project Manager

X. Shortfall in equipment / Line performance Certificate issued by Project Manager,

XI. No demand certificate issued by contractor,

XII. Certificate about completion of Defect Liability Period of the package by Project Manager,

XIII. Certificate regarding return of Performance Security / Indemnity Bond by Project Manager/Employer.

45. **Banning of business dealings**

45.1. Employer shall ban business dealings with contractor on following grounds for the period as decided by Project Manager:-

a. If the contractor fails to submit Performance Security after issuance of Letter of Intent (LoI) within 28 days.

b. If the Contractor fails to accept the award of contract or has abandoned or repudiated the Contract.

c. If the Contractor is found to be non-performing in execution of contract by the Employer.

d. If a disaster / major failure / accident / collapse of a structure / system is caused during erection or during defect liability period due to negligence of contractor or design deficiency or poor quality of execution.

e. Misbehavior or physical manhandling by the Contractor or his representative or any person acting on his behalf with any official of the Company dealing with the concerned contract is established.

f. If the Director / Owner of the Contractor, proprietor or partner of the Contractor, is convicted by a court of law for offences involving corrupt and fraudulent practices including moral turpitude in relation to its business dealings with the government or State Public

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Sector Undertakings or Central Public Sector Undertakings or Employer or Employer’s group companies, during the last five years.

g. If the proprietors of the Contractor have been guilty of malpractices such as bribery, corruption, fraud, substitution of the tenders, interpolations, etc.

h. If the Contractor continuously refuses to return / refund the dues of Employer or Employer’s group companies, without showing adequate reason and this is not due to any reasonable dispute which would attract proceedings in arbitration or court of Law;

i. If the Contractor employs a public servant dismissed / removed or employs a person convicted for an offence involving corruption or abetment of such offences;

j. If business dealings with the Contractor have been banned by the Ministry of Power or Government of India and the ban is still in force;

k. If it is established that Contractor has resorted to corrupt, fraudulent practices including misrepresentation of facts;

l. If the Contractor uses intimidation/threatening or brings undue outside pressure on the Project Manager or his authorized representatives or its officials in acceptance / performance of the job under the contract.

m. If the Contractor indulges in repeated and / or deliberate use of delay tactics in complying with contractual stipulations;

n. If the Contractor is found to be involved in cartel formation during bidding.

o. On willful indulgence by the Contractor in supplying sub-standard material with respect to Technical Specifications under the Contract irrespective of whether pre-dispatch inspection was carried out by Employer or not;

p. If the Contractor is declared bankrupt or insolvent or its financial position has become unsound, and in the case of a limited company, it is wound up or liquidated.

q. Established litigant nature of the Contractor to derive undue benefit;

r. Continued poor performance of the Contractor;

s. If the Contractor violates the provisions of the Integrity Pact provided in the Contract.

t. If the Contractor commits fraud as defined under the Fraud Prevention Policy of Employer.

u. If the Contractor has assigned or transferred the contract or engaged subcontractor(s) without the prior approval of the Competent Authority in violation of the provisions of the contract.

v. If the Contractor misuses the premises or facilities of the Employer, forcefully occupies, tampers or damages the Employer’s properties including land, water resources, forests / trees, etc.

w. If the security consideration, including questions of loyalty of the Contractor to the state, so warrants;

47 Salvage Material:
Redundant Salvage Material like meters, poles, conductor, insulators and allied hardware etc. shall be dismantled by the contractor at his expense and the same be deposited in the stores of the utility/employer/owner against proper return indent duly signed by the project manager.

----- End ----
VOLUME-I: SECTION – V

SPECIAL CONDITIONS OF CONTRACT (SCC)
SPECIAL CONDITIONS OF CONTRACT (SCC)

The following bid specific data for the Plant and Equipment to be procured shall amend and/or supplement the provisions in the General Conditions of Contract (GCC)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>GCC Clause Ref. No.</th>
<th>Amendment/Supplement to GCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>GCC 1.1(o)</td>
<td>Supplementing Sub-Clause GCC 1.1(o)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Employer is: REC Power Distribution Company Limited, A10, 4th Floor, Kribhco Bhawan, Sector-1, Noida – 201301 Tele: 0120-4383755 Email: <a href="mailto:jkpdd.projects@recpdcl.in">jkpdd.projects@recpdcl.in</a>/ <a href="mailto:Bhupender_g@gmail.com">Bhupender_g@gmail.com</a> Fax:0120 4383768</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For the purpose of execution of the contract, the contractual activities shall be performed by the Employer &quot;for and on behalf of the Owner&quot; except in cases where the Owner itself is statutorily required to do so.</td>
</tr>
<tr>
<td>2.</td>
<td>GCC 1.1(w)</td>
<td>Supplementing Sub-Clause GCC 1.1(w)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Owner is: Power Development Department of Jammu &amp; Kashmir Government.</td>
</tr>
<tr>
<td>3.</td>
<td>GCC 1.1 (ee)</td>
<td>Supplementing Sub-Clause GCC 1.1(ee)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu &amp; Kashmir with 5 years FMS including Operation &amp; Maintenance, for Power Development Department (PDD) of Government of J&amp;K under PMDP, IPDS &amp; DDUGJY Schemes of Govt. of India</td>
</tr>
<tr>
<td>4.</td>
<td>GCC 2.1</td>
<td>GCC 2.1.1 The Contract to be entered into with the successful Bidder shall be as under:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Single Contract: For supply of all equipment and materials and for providing all erection services including inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, Testing and Commissioning including performance testing in respect of all the equipment supplied and any other services specified in the Contract Documents (Services Contract).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GCC 2.1.2 The award of two separate Contracts shall not in any way dilute the responsibility of the Contractor for the successful completion of the facilities as per Specification and a breach in one Contract shall automatically be construed as a breach of the other Contract(s) which will confer a right on the Employer to terminate the other Contract(s) also at the risk and the cost of the Contractor.</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>GCC Clause Ref. No.</td>
<td>Amendment/Supplement to GCC</td>
</tr>
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</tbody>
</table>
| 5.     | GCC 8.3             | **Addition of following new Sub-Clause after GCC 8.2:**  
All the payments of project cost of infrastructure to the Contractor shall be made by RECPDCL, strictly out of the funds received from REC/PFC/Any other Govt. agencies, on behalf of the Owner.  
The invoices shall be raised by the bidder in the name of J&K Power Development Department(Owner), REC Power Distribution Company Ltd, J&K address. |
| 6.     | GCC 11              | At all places in the clause, replace the word “Employer” with “Employer/Owner/State Distribution Utility in case employer is a Central Public Undertaking.” |
| 7.     | GCC 9.3.1           | **Supplementing Sub-Clause GCC 9.3.1**  
In addition to the above, the Contractor shall arrange to provide additional Performance Security(ies), if applicable, as per Clause no. 4 of Joint Deed of Undertaking mentioned at Sl. No. 19 of Volume-I : Section–VI (Sample Forms and Procedures). The said security(ies) shall be required to be extended time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract.  
The Performance Security(ies) to be furnished by the Contractor under the Contract shall be in favour of the Employer. The Owner shall also be entitled to enforce these performance security(ies). |
| 8.     | GCC 22.4, 22.5, 22.6 & 22.7 | At all places in the clause, replace the word “Employer” with “Employer/Owner/State Distribution Utility in case employer is a Central Public Undertaking”. |
| 10.    | GCC 33.2.3          | **Supplementing Sub-Clause GCC 33.2.3**  
Percentage for the Change Proposal under this Clause shall be limited to Ten (10) percent. |
| 11.    | Annexure-I to SCC  | **Enclosed herewith** |
| 12.    | Others              | **Rating of Equipment** - Standard Ratings of equipment as per IS are covered in bid documents. Equipment ratings must be confirming to IS specifications. Non Standard ratings shall not be permitted. |
| 13.    | Climate Condition   | **All material must supply as per climate condition mentioned below**  
|        | Maximum altitude above sea level | 5000 m |
|        | Maximum ambient air temperature | 50° C |
|        | Maximum daily average ambient air temperature | 40° C |
|        | Minimum ambient air temperature | -30° C |
|        | Maximum temperature attainable by an object exposed to the sun | 60 ° C |
|        | Maximum yearly weighted average ambient temperature | 32° C |
### Amendment/Supplement to GCC

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>GCC Clause Ref. No.</th>
<th>Maximum relative humidity</th>
<th>Average number of thunderstorm days per annum(isokeraunic level)</th>
<th>average number of rainy days per annum</th>
<th>average annual rainfall</th>
<th>Maximum wind pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>100%</td>
<td>70</td>
<td>120</td>
<td>1500 mm</td>
<td>260 Kg/m²</td>
</tr>
</tbody>
</table>

The climatic conditions mentioned in SCC shall supersede any other climatic condition mentioned in the SBD or technical Specifications.

**14. Rules /regulation**  
Various Indian acts/ rules/ regulations shall be replaced with equivalent acts/ rules/ regulations of J&K wherever these occur in the tender document.

**15. Survey Drawings**  
The Contractor shall submit GPS based as-build/as-executed drawing (in 3 hard copies and 1 soft copy (prepared in AUTO-CAD) and joint measurement sheet after completion of the project along with details of executed material and material reconciliation statement of the completed work. Still photography and videography of the executed work shall be done by the contractor after completion of work submitted with as-build/as-executed drawings. Still photography and videography of the existing network has to be ensured before dismantling and after re-erection. Any other documents regarding execution of works as required by the RECPDCL for closure of the project shall also be provided by the contractor.

**16. Annexure-A to Vol-1, Section VII General Technical Instructions**  
For this tender, clauses of General Technical Instructions pertaining to supply, inland transportation, insurance, delivery & unloading of materials, erection, testing & commissioning of works, etc. as per scope of work shall only be applicable and other irrelevant clauses of General Technical Instructions shall not be applicable.

**17. Vol-II_Section-I, Section-II PMS, QAM & PMA**  
For this tender, clauses of Project Management System (PMS), Quality Assurance & Evaluation Mechanism (QAM), Documentation & PMA pertaining to supply, inland transportation, insurance, delivery & unloading of materials, erection, testing & commissioning of works, etc. as per scope of work shall only be applicable and other irrelevant clauses of PMS, QAM & PMA shall not be applicable.

**18. Taxes & Duties**  
The prices mentioned in the work order are for delivery at Jammu & Kashmir (J&K). The prices are FOR destination, inclusive of all applicable taxes, duties, levies, transit insurance, transportation, loading & unloading of material at site etc., applicable for entire scope of work and for delivery at the specified locations in J&K State.

If it is found that the tax quoted is higher than the applicable tax, in that case applicable taxes will only be paid by RECPDCL and if the tax quoted is lower than the applicable tax, in that case only the quoted taxes will be paid by the RECPDCL.

In case of any variation (positive/negative) in existing rates of taxes/ duties/ levies or a new tax/ duty/ levy is introduced or any existing tax/ duty/ levy is abolished in the course of the performance of the contract., which will/ may impact the overall pricing in connection with performance of the contract, an equitable adjustment of the contract price shall be made to the factor any such change by addition to the contract price or deduction therefrom, as the case may be. Break-up of taxes as mentioned in Price Bid will constitute an integral part of contract agreement. Tax break-up will be utilized to ascertain the computation of taxes and total impact due to revision in applicable tax rate or introduction of new tax, if any. Any positive adjustment in contract price is subject to submission of requisite documentary evidence by the Supplier.

In case of reduction in the taxes & duties, same shall be recovered from the contractor.

**19. Statutory Deductions**  
All the payment shall be made subject to compliance of all Statutory requirements. In case any non-compliance to contract conditions comes to Employer's notice, Employer will be entitled to deduct 30% of estimated wages plus 20% of wages as Employer's overheads. Associates would be obliged to provide the copy of monthly wage sheet in any case, failing which no payment shall be made. Employer at their sole discretion may deposit the PF etc. with statutory authorities. Employer will deduct the amounts of TDS as per statutory requirement under the income tax act and the GST Act and certificates (wherever applicable) will be issued to associate accordingly.
In case of non-submission of PAN No., TDS @ 20% shall be deducted from all payable amounts for which no TDS certificate shall be issued. TDS once deducted as above shall not be revised in any condition. Employer will not provide any forms for getting concession in payment/or transportation like e-Way Bill in respect of taxes/GST law.

### Sl. No. | GCC Clause Ref. No. | Amendment/Supplement to GCC
--- | --- | ---
20. | Manpower | Bidder needs to employ minimum 50% manpower of the total manpower deployed by the bidder must be from Jammu and Kashmir resident only.
21. | | The engraving of word IPDS/PMDP as applicable in materials Cables, Energy Meter etc. is mandatory requirement. The Project Manager shall ensure strict compliance of this requirement. Also, while processing payments to the Contractor, suitable documentary evidence / photographs must be asked by the Project Manager in support of the compliance.
22. | | The bidder shall submit the Manufacturing Quality Plan (MQP) & Installation Quality Plan (IQP) for approval by the employer as per agreed project schedule.
23. | | The detailed Safety Plan, relevant to the project site, must be submitted within 60 days of the award of the contract.
24. | | The hierarchy of documents to be considered for interpretation shall be in the following order i.e Purchase Order Copy, Special Conditions of Contract, any corrigendum and addendums Technical Specifications & General Conditions of Contract as part of tender document.

----- End of Section-V (SCC) ----
### Special Conditions of Contract (SCC)

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<td>For this tender, clauses of General Technical Instructions pertaining to supply, inland transportation, insurance, delivery &amp; unloading of materials, erection, testing &amp; commissioning of works, etc. as per scope of work shall only be applicable and other irrelevant clauses of General Technical Instructions shall not be applicable.</td>
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----- End of Section-V (SCC) ----
VOLUME-I: SECTION – VI

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SAMPLE FORMS AND PROCEDURES (FORMS)

Preamble

This Section (Section –VI) of the Bidding Documents [named as Sample Forms and Procedures (FORMS)] provides proforma to be used by the bidders at the time of their bid preparation and by the Contractor subsequent to the award of Contract.

The Bidder shall complete, sign and submit with its bid the relevant FORMS to be used un-amended, in accordance with the requirements included in the Bidding Documents.

The Bidder shall provide the Bid Security, either in the form included hereafter or in another form acceptable to the Employer, pursuant to the provisions in the instructions to Bidders.

The Form of Contract Agreement shall be used un-amended, except for the need to complete Article 1.1 (Contract Documents), as appropriate and as may be required to suit the specific requirement of the Contract. The form shall also include the Appendices listed, as required, which should be completed according to the instructions for their completion provided at the beginning of each Appendix. The Price Schedule deemed to form part of the contract shall be modified according to any corrections or modifications to the accepted bid resulting from price corrections, pursuant to the provisions of the Instructions to Bidders.

The Performance Security(ies) and Bank Guarantee for Advance Payment forms should not be completed by the bidders at the time of their bid preparation. Only the successful Bidder will be required to provide the Performance Security(ies) and Bank Guarantee for Advance Payment, according to one of the forms indicated herein or in another form acceptable to the Employer and pursuant to the provisions of the General and Special Conditions of Contract, respectively.

Depending on specific facts and circumstances related to the Bid, other specific agreement, if any, and the contract, the text of the Forms herein may need to be modified to some extent. The Employer reserves the right to make such modifications in conformity with such specific facts and circumstances and rectify and consequent discrepancies, if any. However, modifications, if any, to the text of the Forms that may be required in the opinion of the Bidder/Contractor shall be effected only if the same is approved by the Employer. The Employer's decision in this regard shall be final and binding.
1. BID FORMS AND PRICE SCHEDULES

1.1 Bid Form

Please see Volume – III.

1.2 Price Schedule

Please see Volume - III
2. BID SECURITY FORM

(To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper should be in the name of the issuing Bank)

Bank Guarantee No.: ........................
Date: ........................

To: (insert Name and Address of Employer)

WHEREAS M/s. .... (insert name of Bidder)...... having its Registered/Head Office at ..... (insert address of the Bidder) ............ (hereinafter called “the Bidder”) has submitted its Bid for the performance of the Contract for ..........(insert name of the Package)...............under..........(insert Specification No)............... (hereinafter called “the Bid”)

KNOW ALL PERSONS by these present that WE ........(insert name & address of the issuing bank) ........ having its Registered/Head Office at ............(insert address of registered office of the bank). ....... (hereinafter called “the Bank”), are bound unto ......(insert name of Employer)..... (hereinafter called “the Employer”) in the sum of .........(insert amount of Bid Security in figures & words)................. for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents.

Sealed with the Common Seal of the said Bank this ............... day of ............... 20....

THE CONDITIONS of this obligation are:

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

(2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him in Attachment – Declaration of the Bid; or

(3) If the Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Clause 27.2; or

(4) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that Country, within ten days from the date of intimation of post – bid discussion; or

(5) in the case of a successful Bidder, if the Bidder fails within the specified time limit

(i) to sign the Contract Agreement, in accordance with ITB Clause 33, or

(ii) to furnish the required performance security, in accordance with ITB Clause 34.

or

(6) In any other case specifically provided for in ITB.

WE undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it, owing to the occurrence of any of the above-named CONDITIONS or their combination, and specifying the occurred condition or conditions.
This guarantee will remain in full force up to and including .......... (insert date, which shall be the date 30 days after the period of bid validity)........, and any demand in respect thereof must reach the Bank not later than the above date.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_______________________

Name_______________________

Designation_______________________

POA Number_______________________

Contact Number(s): Tel.______________Mobile______________

Fax Number_______________________

email ____________________________

Common Seal of the Bank______________________

Witness:

Signature_______________________

Name_______________________

Address______________________________

Contact Number(s): Tel.______________Mobile______________

email ____________________________

Note:

1. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph for limitation of liability, the following may be added at the end of the proforma of the Bank Guarantee [i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee]:

Quote

"Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _________ (value in figures)__________ [______________________ (value in words)_________________].

2. This Bank Guarantee shall be valid upto _________(validity date)__________.

3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _________ (validity date) _________.”

Unquote
3a. **FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK**  
(Applicable for Forfeiture of Bank Guarantee)

To: *(insert Name and Address of the issuing Bank)*

Ref.: Forfeiture of Bid Security Amount against Bank Guarantee No. ………. ……….. dated ………… for ………….., issued by you on behalf of M/s. ……… *(insert name of the Bidder) ………….*

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour for …………………… as Bid Security for the bid submitted by M/s. ……… *(insert name of the Bidder) ………….* against ….. *(insert name of the Package) ………….* ; Specification No. ……………………

As per the terms of the said guarantee, the bank has guaranteed and undertaken to pay immediately on demand by the Employer the amount of …………….. without any reservation, protest, demur and recourse. Further, any demand made by the Employer shall be conclusive and binding on the Bank irrespective of any dispute or difference raised by the Bidder.

In terms of the said guarantee, we hereby submit our claim/demand through this letter for remittance of Bid Security amount to …. *(insert name of the Employer) ……….* owing to the occurrence of the condition referred to at Sl. No. ………. The Bank is requested to remit the full guaranteed sum ……………………. towards proceed of the bid security in the form of Demand Draft in favour of ‘…. *(insert name of the Employer) ……….*’, payable at …. *(insert place of the Employer)….’.

Thanking you,

For……………….(Name of the Employer)

*(AUTHORISED SIGNATORY)*

Copy to:
….. *(Registered Office of the Bank)….*
3b. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK
(Applicable for conditional claim pending extension of Bank Guarantee by the Bidder)

To: (insert Name and Address of the issuing Bank)

Ref.: Conditional Claim against Bank Guarantee No. .... ............... dated .............. for ................. valid up to
............. issued by you on behalf of M/s. ........ (insert name of the Bidder) ..........

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour on behalf of M/s. ........ (insert name of the Bidder) ..........., who have submitted this Bank Guarantee to us towards Bid Security against ..... (insert name of the Package) ........; Specification No. ..................

We, ........ (insert name of the Employer) ........ do hereby request you to lodge our claim/demand against the subject Bank Guarantee for full guaranteed sum. Kindly note that this claim/demand against the subject Bank Guarantee is without any further notice in case the amendment to Bank Guarantee No. ................ dated ............. extending its validity upto ............. is not got arranged by ........ (insert name of the Bidder) ........ in our favour and are not received by us upto ............. In such an event you are requested to remit the full guaranteed amount in terms of the subject guarantee in its letter and spirit and proceeds of this Bank Guarantee shall be forwarded to us in form of demand draft in favour of `.... (insert name of the Employer) ........, payable at .... (insert place of the Employer)....'.

This is without prejudice to our right under this guarantee and under the law.

Thanking you,

For..................(Name of the Employer)

(AUTHORISED SIGNATORY)

Copy to: (insert Name and Address of the Bidder)

- You are requested to do the needful so that the amendment to the subject Bank Guarantee extending the validity up to ............. is received by us by .............
4. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT'

4a. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR SUPPLY OF EQUIPMENT

Ref. No. :

Date :

............(insert Contractor's Name & Address)............
...............................................................................
...............................................................................
...............................................................................

[in case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:
(Lead Partner of the Joint Venture of M/s. .................... and M/s. ....................)]

Attn : Mr......................

Sub. : Notification of Award for Ex-works Supply Contract for .......... (insert name of the Package) .......... Specification No.: ................. Domestic Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated ............

1.2 Bidding documents for the subject package issued to you vide our letter Ref. No. ................. dated ............, comprising the following:

   a) Conditions of Contract Volume-I
      (Document Code No. .......................)
   b) Technical Specifications, Drawings Volume-II
      (Document Code No. .......................)
   c) Bid Form, Price Schedules Volume-III
      & Technical Data Sheets
      (Document Code No. .......................)

1.2.1 Amendment/Errata No. ...... to Bidding Documents issued to you vide our letter no. ............ dated ............
   (Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on ............, issued to you vide our letters no. ............ dated ............ (Use as applicable)
   (Applicable only if any clarification to the Bidding Documents has been issued subsequently)
   (INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 First envelope of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s. ................. (Lead Partner) and M/s. ................. (Other Partner) for the subject package under Proposal reference no. ............ dated ............ was opened on ............ (Use as applicable)
1.4 Intimation for Opening of Price Schedule issued to you vide our letter no. .......... dated ............

1.5 Your Bid/the Bid by the Joint Venture (JV) of M/s. ......................... (Lead Partner) and M/s. ................................. (Other Partner) under proposal reference no. ............... dated .......... was opened on...................(Use as applicable)

1.6 Post bid discussions we had with you on various dates from ............. to ............. resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 **AWARD OF CONTRACT AND ITS SCOPE**

2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. ........................... (Lead Partner) and M/s. ....................... (Other Partner) (Use as applicable) (referred to at para 1.3 & 1.5 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [modify as applicable] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you/the JV(use as applicable) the 'Ex-works Supply Contract' (also referred to as the 'First Contract') covering inter-alia Ex-works supply of all equipment and materials including Type Testing to be conducted, required for the complete execution of the ...... (insert name of Package alongwith name of the Project) ......, as detailed in the documents referred hereinabove. The scope of work inter-alia includes the following:

............. (Indicate brief Scope of Work) .................

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the construction of ...... (insert name of Package alongwith name of the Project) ......, unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s. ......................, the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (This provision shall be included only in case the Bidder is a Joint Venture)

2.2 The notification for award of Contract for performance of all other activities, as set forth in the Bidding Documents, viz.

...................... (Indicate brief scope of work of the Second Contract) .........................

has been issued on you vide our NOA no. ............. dated .............. (hereinafter called the "Second Contract" or "Services Contract").

Notwithstanding the award of work under two separate Contracts in the aforesaid manner, you/the JV (use as applicable) shall be overall responsible to ensure the execution of both the Contracts to achieve successful completion and taking over of the works under the package by the Employer as per the requirements stipulated in the Bidding Documents. It is expressly understood and agreed by you/the JV (use as applicable) that any default or breach under the 'Second Contract' shall automatically be deemed as a default or breach of this 'First Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'Second Contract', either in full or in part, and/or recover damages there under, shall give us an absolute right to terminate this Contract, at your/JV’s (use as applicable) risk, cost and responsibility, either in full or in part and/or recover damages under this ‘First Contract’ as well. However, such default or breach or occurrence in the ‘Second Contract’, shall not automatically relieve you/the JV (use as applicable) of any of your/JV’s (use as applicable) obligations under this ‘First Contract’. It is also expressly understood and agreed by you/the JV (use as
applicable) that the equipment/materials supplied by you/the JV (use as applicable) under this ‘First Contract’, when erected, installed & commissioned by you under the ‘Second Contract’ shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE

3.1 The total Contract Price for the entire scope of work under this Contract shall be ............... (Specify the currency and the amount in figures & words) .............. as per the following break-up:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Price Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ex-Works Price component</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Type Test Charges</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Total for Ex-works Supply Contract

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You/The JV (use as applicable) are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of ...... (Specify the value) ............ i.e. equal to 10% (Ten percent) of the Contract Price, and valid upto and including ..................... and any other securities as per the Bidding Documents. (In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 For release of advance payment (admissible as per the Bidding Documents) equal to ......% of the Ex-works Price component of the Contract Price, you are, inter-alia, required to furnish a Bank Guarantee for the equivalent advance amount. The validity of the Advance Bank Guarantee shall be up to and including ............... Further, please note that furnishing of all the Contract Performance Securities under the ‘First Contract’ and ‘Second Contract’ shall be one of the conditions precedent to release of advance under this Contract.

6.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

7.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the ...... (insert name of Package alongwith name of the Project) ...... shall be ... (indicate the completion schedule) .... months from the date of issue of this Notification of Award for all contractual purposes.

8.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

9.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

10.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

..............(Name of the Employer)..............

(Authorised Signatory)
Enclosures:
APPENDIX (NOA) – 1 - Record Notes of Post-Bid Discussions held on various dates from .......... to .................

4b. FORM OF ‘NOTIFICATION OF AWARD OF CONTRACT’ FOR INSTALLATION OF EQUIPMENT

Ref. No. :

Date : ............(insert Contractor’s Name & Address) ............
........................................................................................................
........................................................................................................
........................................................................................................

[In case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:
(Lead Partner of the Joint Venture of M/s. ................. and M/s. .........................)]

Attn : Mr. ...........................................

Sub. : Notification of Award for Services Contract for ............ (insert name of the Package) ............ Specification No.: ................. Domestic Competitive Bidding. (Project Funding: Domestic).

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Invitation for Bids (IFB) dated ............

1.2 Bidding documents for the subject package issued to you vide our letter Ref. No. ................. dated ............, comprising the following:

a) Conditions of Contract Volume-I
   (Document Code No. .................)

b) Technical Specifications Volume-II
   (Document Code No. .................)

c) Bid Form, Price Schedules Volume-III
   & Technical Data Sheets
   (Document Code No. .................)

1.2.1 Amendment/Errata No. ...... to Bidding Documents issued to you vide our letter no. ............. dated .............
   (Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on ............., issued to you vide our letters no. ............. dated ............. (Use as applicable)
   (Applicable only if any clarification to the Bidding Documents has been issued subsequently)

   (INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)
1.3 First envelope of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s. ........................................ (Lead Partner) and M/s. ........................................ (Other Partner) for the subject package under Proposal reference no. .......... dated ................. was opened on ................. (Use as applicable)

1.4 Intimation for Opening of Price Schedule issued to you vide our letter no. .......... dated .................

1.5 Your Bid/the Bid by the Joint Venture (JV) of M/s. ........................................ (Lead Partner) and M/s. ........................................ (Other Partner) under proposal reference no. .......... dated ................. was opened on...............(Use as applicable)

1.6 Post bid discussions we had with you on various dates from ................. to ................. resulting into the Minutes of Meeting/Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. .................. (Lead Partner) and M/s. ............... (Other Partner) (Use as applicable) (referred to at para 1.3 & 1.5 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [modify as applicable] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you/the JV(use as applicable) the 'Services Contract' (also referred to as the 'Second Contract') for performance of all other activities, as set forth in the documents, viz. ..................... (Indicate brief scope of work) ................................................ for the ...... (insert name of Package along with name of the Project)....

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the Bidding Documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the construction of ...... (insert name of Package along with name of the Project) ......, unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s. .................., the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (This provision shall be included only in case the Bidder is a Joint Venture)

2.2 The notification for award of Contract for Ex-works Supply of all equipment and materials including Type Testing to be conducted, as set forth in the - documents, viz.

............... (Indicate brief scope of work of the First Contract) ......................

has been issued on you vide our NOA no. .......... dated .......... (hereinafter called the "Ex-works Supply Contract" or "First Contract").

Notwithstanding the award of work under two separate Contracts in the aforesaid manner, you/the JV (use as applicable) shall be overall responsible to ensure the execution of both the Contracts to achieve successful completion and taking over of the works under the package by the Employer as per the requirements stipulated in the Bidding Documents. It is expressly understood and agreed by you/the JV(use as applicable) that any default or breach under the 'First Contract' shall automatically be deemed as a default or breach of this 'Second Contract' also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the 'First Contract', either in full or in part, and/or recover damages there under, shall give us an absolute right to terminate this Contract, at your/JV’s (use as
applicable) risk, cost and responsibility, either in full or in part and/or recover damages under this ‘Second Contract’ as well. However, such default or breach or occurrence in the ‘First Contract’, shall not automatically relieve you/the JV (use as applicable) of any of your obligations under this ‘Second Contract’. It is also expressly understood and agreed by you/the JV (use as applicable) that the equipment/materials supplied by you/the JV (use as applicable) under the ‘First Contract’, when erected, installed & commissioned by you/the JV (use as applicable) under this ‘Second Contract’ shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 **CONTRACT PRICE**

3.1 The total Contract Price for the entire scope of work under this Contract shall be ........................ (Specify the currency and the amount in figures & words) ........................ as per the following break-up:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Price Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Local Transportation, Insurance and other Incidental Services (including port clearance etc)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Installation Services</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Training Charges</td>
<td>Not Applicable</td>
</tr>
<tr>
<td></td>
<td><strong>Total for Services Contract</strong></td>
<td></td>
</tr>
</tbody>
</table>

3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

4.0 You/the JV (use as applicable) are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of .......... (Specify the value) ........................ i.e. equal to 10% (Ten percent) of the Contract Price, and valid upto and including ............................ and any other securities as per the Bidding Documents.

(In case any other performance security is required to be furnished, the same is to be mentioned here)

5.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.

6.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful completion of the ...... (insert name of Package alongwith name of the Project) .... shall be ... (indicate the completion schedule) .... months from the date of issue of this Notification of Award for all contractual purposes.

7.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.

8.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.

9.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

.............................................................

Page 128 of 444

IPDS & PMRP / SBD/R1
For and on behalf of

...............(Name of the Employer)..........  

(Authorised Signatory)

Enclosures:
APPENDIX (NOA) – 1 - Record Notes of Post - Bid Discussions held on various dates from .............
           to .................

Note:
(1) Instructions indicated in italics in this notification of award are to be taken care of by the issuing authority. The Forms may be modified appropriately to suit the specific requirement of the Contract.
5. FORM OF CONTRACT AGREEMENT

[Alternative – a]

SUPPLY CONTRACT AGREEMENT BETWEEN ................... (Name of Employer) ................. AND M/s. ................... (Name of Contractor) ................../JOINT VENTURE (JV) OF M/s. ....... (Name of Lead Partner)....... (THE LEAD PARTNER OF THE JV) AND M/s. ......(Name of Other Partner)...... (THE PARTNER OF THE JV) [Use as applicable]

THIS CONTRACT AGREEMENT No. ............... (also referred to as ‘Ex-Works Supply Contract/the First Contract’) is made on the ..... day of .............. 20.....

BETWEEN

(1) ...................... (Name of Employer).................... a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Registered Office at ..........(registered address of the Employer) .................. and its Corporate Office at ..........(address of the Employer) .................. (hereinafter called “the Employer” and also referred to as “.....(insert abbreviated name of the Employer) .......

and

(2) M/s ............ (Name of Contractor) ............, a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at ...........(Address of Contractor) .................. and Registered Office at ..........(Registered address of Contractor) .................. (hereinafter called “the Contractor” and also referred to as “.....(insert abbreviated name of the Contractor) .......

or

Joint Venture (JV) of M/s ............ (Name of Lead Partner) ............ (the Lead Partner of JV), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at ...........(Address of Lead Partner) .................. and Registered Office at ...........(Registered address of Lead Partner) .................. and M/s ............ (Name of Other Partner) ............ (the Partner of JV), a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at ...........(Address of Other Partner) .................. and Registered Office at ...........(Registered address of Other Partner) .................. (hereinafter called “the Contractor” and also referred to as “Joint Venture”/the ‘JV’”) (Applicable only in case of Joint Venture)

WHEREAS the Employer desires to engage the Contractor for the supply of all equipment and materials including taxes and duties as applicable, Type Testing to be conducted inter-alia including ...................... (Indicate brief scope of work) ...................... for the complete execution of the ...... (insert name of Package alongwith name of the Project)...... as detailed in the Contract Document (“the Facilities”), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2.2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

VOLUME – A
1. This Contract Agreement and the Appendices thereto.
2. Invitation for bids (Reference No.…… dated……)
3. Pre-bid clarification (Reference No.……. dated……)
4. Letter of Intent (Reference No.……. dated……)
5. Mutually agreed contract execution plan/PERT chart (Reference No.……. dated……)
6. Contract Performance Securities (Reference No.……. dated……)
7. Letter of Award (Reference No.……. dated……)

VOLUME – B

3. “Bidding Documents” comprising of the following:

The Bidding Document is a compilation of the following and shall include amendments…. to ……, if any, thereto:

a. VOLUME – I: Condition of contract (Document Code No.: ……………):  
   Section I: Invitation for Bid (Section - IFB)
   Section II: Instructions to Bidders (Section – ITB)
   Section III: Bid Data sheets (BDS)
   Section IV: General Conditions of Contract (GCC)
   Section V: Special Conditions of Contract (SCC)
   Section VI: Sample Forms and Procedures (FP)
   1. Bid Form & Price Schedule
      1.1 Bid Form
      1.2 Price Schedule
   2. Bid Security Form
   3. Form of Notification by the Employer to the Bank
      3.a Applicable for forfeiture of Bank Guarantee
      3.b Applicable for conditional claim pending extension of Bank Guarantee by the bidder.
   4. Form of ‘Notification of Award of Contract’
      4(a) Form of ‘Notification of Award of Contract’ for Supply of Plant and equipment
      4(b) Form of ‘Notification of Award of Contract’ for Installation of Plant and equipment
   5. Form of Contract Agreement
      Alternative A
      Alternative B
      5.1 Appendix-1: Terms and Procedures of Payment:
         Grid/Power Substation, and 11KV, Distribution Transformer, LT and Service connection
      5.2 Appendix-2: Price Adjustment
      5.3 Appendix-3: Insurance Requirements
      5.4 Appendix-4: Time Schedule
      5.5 Appendix-5: List of Approved Subcontractors
      5.6 Appendix-6: Scope of Works and Supply by the Employer
      5.7 Appendix-7: List of Document for Approval or Review
      5.8 Appendix-8: Guarantees, Liquidated Damages for Non-Performance
   6. Performance Security Form
   7. Bank Guarantee Form for Advance Payment
   8. Form of Taking over Certificate
9. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in one lot by Employer for performance of its contract
10. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in installments by Employer for performance of its contract
11. Form of Authorisation Letter
12. Form of Trust Receipt for Plant, Equipment and Materials received
13. Form of Extension of Bank Guarantee
14. Form of Power of Attorney for Joint Venture
15. Form of Undertaking by the Joint Venture Partners
16. Format for Evidence of Access to or Availability of Credit/Facilities
17. Form of Operational Acceptance
18. Form of Safety Plan to be submitted by the Contractor within sixty days of award of contract
19. Form of joint deed of undertaking by the Sub-contractor along with the bidder/contractor
20. Form of Certificate of Financial Parameters for QR

Section VII: Scope of works,

b. VOLUME-II: Bid –Proposal Sheets (Document Code No.: ...............):
   Section I: Project Management System (PMS), Quality Assurance & Evaluation Mechanism, Documentation & PMA
   Section II: Bid Forms
   Section III: Price Schedules

c. VOLUME-III: Technical Specifications, Drawings (Document Code No.: ...............):
   Section I: Technical Specifications
   Section II: Tender Drawings
   Section III: Technical Specifications for IPDS

VOLUME – C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1/SCC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment
2.1 Contract Price (Reference GCC Clause 7)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of

\[ \text{\textit{amount in words}} \] \[ \text{\textit{amount in figures}} \], or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract price is as under:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Price Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ex-Works Price Component</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Type Test Charges</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Total</td>
<td>for Ex-Works Supply Contract</td>
<td></td>
</tr>
</tbody>
</table>

The detailed break-up of Contract Price is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 8)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award i.e.,

\[ \text{\textit{date}} \]

from \[ \text{\textit{date}} \].

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

List of Appendices

Appendix 1 Terms and Procedures of Payment
Appendix 2 Price Adjustment
Appendix 3 Insurance Requirements
Appendix 4 Time Schedule
Appendix 5 List of Approved Subcontractors
Appendix 6 Scope of Works and Supply by the Employer
Appendix 7 List of Document for Approval or Review
Appendix 8 Guarantees, Liquidated Damages for Non-Performance

Article 5.

The Contract Agreement No. \[ \text{\textit{number}} \] has also been made on the \[ \text{\textit{day}} \] of \[ \text{\textit{year}} \] 20\[\text{\textit{number}}\], between the Employer and the Contractor for the Services Contract (hereinafter referred to as the "Second Contract") for the subject package which includes performance of all the services interalia including \[ \text{\textit{description of scope of work}} \] for the complete execution of the \[ \text{\textit{name of package along with name of project}} \]...
Notwithstanding the award of contract under two separate contracts in the aforesaid manner, the Contractor shall be overall responsible to ensure the execution of both the contracts to achieve successful completion and taking over of the facilities by the Employer as per the requirements stipulated in the Contract. It is expressly understood and agreed by the Contractor that any default or breach under the ‘Second Contract’ shall automatically be deemed as a default or breach of this ‘First Contract’ also and vice-versa and any such breach or occurrence or default giving the Employer a right to terminate the ‘Second Contract’ either in full or in part, and/or recover damages there under that Contract, shall give the Employer an absolute right to terminate this Contract at the Contractor’s risk, cost and responsibility, either in full or in part and/or recover damages under this ‘First Contract’ as well. However, such breach or default or occurrence in the ‘Second Contract’ shall not automatically relieve the Contractor of any of its responsibility/obligations under this ‘First Contract’. It is also expressly understood and agreed by the Contractor that the equipment/materials supplied by the Contractor under this ‘First Contract’ when installed and commissioned by the Contractor under the ‘Second Contract’ shall give satisfactory performance in accordance with the provisions of the Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and on behalf of the Employer

..............................
Signature
..............................
Title
in the presence of

Signed by for and on behalf of the Contractor

..............................
Signature
..............................
Title
in the presence of
5. FORM OF CONTRACT AGREEMENT

[Alternative – b]

SERVICES CONTRACT AGREEMENT BETWEEN ................. (Name of Employer) ................. AND M/s. ................. (Name of Contractor) ................. /JOINT VENTURE (JV) OF M/s. ........ (Name of Lead Partner) ....... (THE LEAD PARTNER OF THE JV) AND M/s. .......(Name of Other Partner)...... (THE PARTNER OF THE JV) [Use as applicable]

THIS CONTRACT AGREEMENT No. ................. (also referred to as ‘Services Contract/the Second Contract’) is made on the ..... day of ........... 20.....

BETWEEN

(1) ................. (Name of Employer) ................. a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Registered Office at ............(registered address of the Employer) ................. and its Corporate Office at ............(address of the Employer) ................. (hereinafter called “the Employer” and also referred to as “.....(insert abbreviated name of the Employer) .......”)

and

(2) M/s .............. (Name of Contractor) ..........., a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at ............(Address of Contractor) ................. and Registered Office at ............(Registered address of Contractor) ................. (hereinafter called “the Contractor” and also referred to as “.....(insert abbreviated name of the Contractor) .......”)

or

Joint Venture (JV) of M/s .............. (Name of Lead Partner) ................. (the Lead Partner of JV), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at ............(Address of Lead Partner) ................. and Registered Office at ............(Registered address of Lead Partner) ................. and M/s .............. (Name of Other Partner) ................. (the Partner of JV), a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at ............(Address of Other Partner) ................. and Registered Office at ............(Registered address of Other Partner) ................. (hereinafter called “the Contractor” and also referred to as “Joint Venture”/the ‘JV”’)
(Applicable only in case of Joint Venture)

WHEREAS the Employer desires to engage the Contractor for providing all the services inter-alia including ................. (Indicate brief scope of work) ................. for the complete execution of the ........ (insert name of Package alongwith name of the Project) ........ as detailed in the Contract Document (“the Facilities”), and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2.2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:
VOLUME – A

1. This Contract Agreement and the Appendices thereto.
2. Invitation for bids (Reference No.…… dated……)
3. Pre-bid clarification (Reference No.…… dated……)
4. Letter of Intent (Reference No.…… dated……)
5. Mutually agreed contract execution plan/PERT chart (Reference No.…… dated……)
6. Contract Performance Securities (Reference No.…… dated……)
7. Letter of Award (Reference No.…… dated……)

VOLUME – B

3. “Bidding Documents” comprising of the following:

The Bidding Document is a compilation of the following and shall include amendments…. to …., if any, thereto:

**a. VOLUME – I:**  **Condition of contract** (Document Code No.: ……………..):

Section I: Invitation for Bid (Section - IFB)
Section II: Instructions to Bidders (Section – ITB)
Section III: Bid Data sheets (BDS)
Section IV: General Conditions of Contract (GCC)
Section V: Special Conditions of Contract (SCC)
Section VI: Sample Forms and Procedures (FP)

1. Bid Form & Price Schedule
   1.1 Bid Form
   1.2 Price Schedule
2. Bid Security Form
3. Form of Notification by the Employer to the Bank
   3.a Applicable for forfeiture of Bank Guarantee
   3.b Applicable for conditional claim pending extension of Bank Guarantee by the bidder.
4. Form of ‘Notification of Award of Contract’
   4(a) Form of ‘Notification of Award of Contract’ for Supply of Plant and equipment
   4(b) Form of ‘Notification of Award of Contract’ for Installation of Plant and equipment
5. Form of Contract Agreement
   Alternative A
   Alternative B
5.1 Appendix-1: Terms and Procedures of Payment: Grid/Power Substation, and 11KV, Distribution Transformer, LT and Service connection
5.2 Appendix-2: Price Adjustment
5.3 Appendix-3: Insurance Requirements
5.4 Appendix-4: Time Schedule
5.5 Appendix-5: List of Approved Subcontractors
5.6 Appendix-6: Scope of Works and Supply by the Employer
5.7 Appendix-7: List of Document for Approval or Review
5.8 Appendix-8: Guarantees, Liquidated Damages for Non-Performance
6. Performance Security Form
7. Bank Guarantee Form for Advance Payment
8. Form of Taking over Certificate
9. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in one lot by Employer for performance of its contract
10. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in installments by Employer for performance of its contract
11. Form of Authorisation Letter
12. Form of Trust Receipt for Plant, Equipment and Materials received
13. Form of Extension of Bank Guarantee
14. Form of Power of Attorney for Joint Venture
15. Form of Undertaking by the Joint Venture Partners
16. Format for Evidence of Access to or Availability of Credit/Facilities
17. Form of Operational Acceptance
18. Form of Safety Plan to be submitted by the Contractor within sixty days of award of contract
19. Form of joint deed of undertaking by the Sub-contractor along with the bidder/contractor
20. Form of Certificate of Financial Parameters for QR

Section VII: Scope of works

d. VOLUME-II: Bid Proposal Sheets (Document Code No.: ……………..):
   Section I: Project Management System (PMS), Quality Assurance & Evaluation Mechanism, Documentation & PMA
   Section II: Bid Forms
   Section III: Price Schedules

e. VOLUME-III: Technical Specifications, Drawings (Document Code No.: ……………..):
   Section I: Technical Specifications
   Section II: Tender Drawings
   Section III: Technical Specifications for IPDS

VOLUME – C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1/SCC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 7)
The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of .......... (amount in words) ................ (.................(amount in figures) .... .......), or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract price is as under:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Price Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Local Transportation, Insurance and other Incidental Services</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Installation Services</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Training Charges (if required)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Total for Services Contract</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The detailed break-up of Contract Price is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 8)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award i.e., from .................

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

List of Appendices

- Appendix 1 Terms and Procedures of Payment
- Appendix 2 Price Adjustment
- Appendix 3 Insurance Requirements
- Appendix 4 Time Schedule
- Appendix 5 List of Approved Subcontractors
- Appendix 6 Scope of Works and Supply by the Employer
- Appendix 7 List of Document for Approval or Review
- Appendix 8 Guarantees, Liquidated Damages for Non-Performance

Article 5.

The Contract Agreement No. ......................... has also been made on the ....... day of ............... 20......, between the Employer and the Contractor for the Ex-Works Supply Contract (hereinafter referred to as the "First Contract") for the subject package which includes Ex-works supply of all equipment and materials including Type Testing to be conducted interalia including ........................... (Indicate brief
Notwithstanding the award of contract under two separate contracts in the aforesaid manner, the Contractor shall be overall responsible to ensure the execution of both the contracts to achieve successful completion and taking over of the facilities by the Employer as per the requirements stipulated in the Contract. It is expressly understood and agreed by the Contractor that any default or breach under the ‘First Contract’ shall automatically be deemed as a default or breach of this ‘Second Contract’ also and vice-versa and any such breach or occurrence or default giving the Employer a right to terminate the ‘First Contract’ either in full or in part, and/or recover damages there under that Contract, shall give the Employer an absolute right to terminate this Contract at the Contractor’s risk, cost and responsibility, either in full or in part and /or recover damages under this ‘Second Contract’ as well. However, such breach or default or occurrence in the ‘First Contract’ shall not automatically relieve the Contractor of any of its responsibility/obligations under this ‘Second Contract’. It is also expressly understood and agreed by the Contractor that the equipment /materials supplied by the Contractor under the ‘First Contract’ when installed and commissioned by the Contractor under this ‘Second Contract’ shall give satisfactory performance in accordance with the provisions of the Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and on behalf of the Employer

Signature

Title

in the presence of

Signed by for and on behalf of the Contractor

Signature

Title

in the presence of

(Separate Contract Agreements shall be executed by the Employer and the Contractor in accordance with the Construction of the Contract stipulated at BDS Clause [ITB 30.4]. The forms of Contract under both Alternative i.e., a & b shall be used).
Appendix-1: TERMS AND PROCEDURES OF PAYMENT

I. “Billable Items” are worked out and attached to Price Schedule. Items otherwise required for completion of work but not listed in the Price Schedule shall also be in the scope of the contractor. The costs of such “Non-billable Items” may be included in the quoted price of “Billable Items” by the bidder in the Price Schedule. The payment shall be made on billable item wise basis only as indicated in Price Schedule.

II. The payment to the Contractor under the contract will be made by the Employer in line with Clause 8, Section GCC, Vol.-I and as per the guidelines and conditions specified hereunder.

III. All progressive payments shall be released on validity of Contract Performance Security and securities against Initial Advance.

IV. The interest rate on advance payment shall be SBI’s Base rate on the date of disbursement of advance payment. The interest accrued on interest bearing advance shall be adjusted first before releasing any payment. The interest rate shall be calculated on the daily progressive balances outstanding as on the date of recovery/adjustment i.e. on daily rest basis.

V. Upon award of the contract, contractor shall be free to take on the work at all the fronts or at specified fronts as advised by Project Manager.

VI. Unmeasured ad-hoc payment: The employer, at his discretion in exigencies, to ensure liquidity of funds with the contractor may accept un-measured ad-hoc bill of the contractor. In this method, following methodology shall be adopted:

   a. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.

   b. Quantum and completion of works is certified by Project Manager jointly with contractor and eligible amount of such works are computed as per approved payment terms.

   c. 50% of such eligible amount shall be released to the contractor immediately within a week. The amount of un-measured bill should not be more than average of previous two measured bill.

   d. Next bill of the work shall invariably be a measured bill in which, various quantities of unmeasured bill shall be verified and measured jointly by Project Manager and contractor.

A. Supply, Erection, Testing and Commissioning of works under “PMDP/IPDS”:

1. Advance payment (Optional):
   
   i. For Ex-works Supply portion, initial interest bearing adjustable Mobilization Advance of 15% of ex-works contract cost excluding taxes and duties shall be released for all the materials in two tranches of 7.5% each, First installment of 7.5% of contract price component shall be released on presentation of the following:

   a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.
b. Submission of Contractor’s detailed invoice for advance payment.

c. Establishment of Contractor’s site offices and certification by Engineer that satisfactory mobilization for erection exists.

d. Submission and acceptance of unconditional & irrevocable part Bank Guarantees (as many number as proposed recovery installments and should be of 110% amount of each installment) in favor of employer with total amounting to 110% of total advance amount as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said Bank Guarantees shall be initially valid upto end of ninety (90) days after the scheduled month of supply of materials and shall be extended from time to time till ninety (90) days beyond revised scheduled month of supply of materials, as may be required under the Contract.

e. An unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 34.1, Section ITB and as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said bank guarantee shall be initially valid up to ninety (90) days after expiry of the Warranty Period and shall be extended from time to time till ninety (90) days beyond successful completion of warranty period, as may be required under the Contract.

f. Detailed PERT Network/Bar chart and its approval by the Employer.

The bidder must utilize first advance installment of 7.5% advance of before requesting for second advance installment. Second installment of 7.5% shall be released on presentation of contractor’s invoice and satisfactory utilization certificate supported with documentary evidences of first advance installment.

ii. For Services portion, initial interest bearing adjustable Mobilization Advance of 10% of erection contract price excluding taxes and duties shall be released for all the works in two tranches of 5% each, First installment of 5% of contract price component shall be released on presentation of the following:

a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.

b. Submission of Contractor’s detailed invoice for advance payment.

c. Establishment of Contractor’s site offices and certification by Engineer that satisfactory mobilization for erection exists.

d. Submission and acceptance of unconditional & irrevocable part Bank Guarantees (as many number as proposed recovery installments and should be of 110% amount of each installment) in favor of employer with total amounting to 110% of total advance amount as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said Bank Guarantees shall be initially valid upto end of ninety (90) days after the scheduled month of supply of materials and shall be extended from time to time till ninety (90) days beyond revised scheduled month of supply of materials, as may be required under the Contract.

e. An unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 34.1, Section ITB and as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said bank guarantee shall be initially valid up to ninety (90) days after expiry of the Warranty Period and shall be extended from time to time till ninety (90) days beyond successful completion of warranty period, as may be required under the Contract.

f. Detailed PERT Network/Bar chart and its approval by the Employer.

The bidder must utilize first advance installment of 5% advance of before requesting for second advance installment. Second installment of 5% shall be released on presentation of contractor’s invoice and satisfactory utilization certificate supported with documentary evidences of first advance installment.
contractor’s invoice and satisfactory utilization certificate supported with documentary evidences of first advance installment.

2. Progressive payments:

The supply & services portion is as defined in ITB Clause 11.

2.1. Supply

2.1.1. First Installment (60%): Sixty percent (60%) payments of supply portion against various items of price schedule including GST etc. shall be paid on Sign off of SRS, design document and Data model and Factory Acceptance test (FAT) and Delivery of Smart Meters along with related Hardware( i.e. Smart Meter, RF NIC, RF Network Equipment and IT HW) & Software(HES, NMS,MDMS and other as required in BID document) at Project site as per below:

- Payment against supply of BoQ items i.e. Smart meters, RF network equipment’s along with other associated accessories as per BoQ, will be made on Prorata basis considering lots of 10,000 each on receipt and acceptance of Materials on submission of requisite documents. Bidder shall be eligible for payment against previous lot only after successful installation of minimum 50% quantity of pervious lot.
- Payment against supply of IT Hardware (as per BoQ) will be made on receipt and acceptance of Materials on submission of requisite documents indicated herein under:
- Payment of SW’s will be made after supply and installation on receipt and acceptance of Materials on submission of requisite documents indicated herein under:
  a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.
  b. An unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 34.1, Section ITB and as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said bank guarantee shall be initially valid upto ninety (90) days after expiry of the Warranty Period and shall be extended from time to time till ninety (90) days beyond successful completion of warranty period, as may be required under the Contract.
  c. Detailed Project Execution Plan/PERT chart and its approval by the Employer.
  d. Evidence of dispatch (R/R or receipted L/R)
  e. Contractor’s detailed invoice as per GST Act & packing list identifying contents of each shipment and credit note for LD/short supply/any other deductions.
  f. Invoice certifying payments of ED, Taxes for the direct transaction between Employer and Contractor,
  g. Copy of Certificate to the effect of payments of State/ Central taxes, duties, levies etc have been made against supply of materials through sub-vendors under the contract.
  i. Manufacturer’s/Contractor’s guarantee certificate of Quality.
j. Material Dispatch Clearance Certificate (MDCC) / Dispatch Instructions (DI) for dispatch of materials from the manufacturer’s works. MDCC/DI shall be issued by authorized officer of Employer.

k. Manufacturer’s copy of challan

l. Submission of the certificate by the Employer’s representative that the item(s) have been received,

m. Submission of certificate by Project Manager that materials have been supplied as per technical specification, scope of work & approved drawings enclosing certified copy of inspection reports and dispatch clearances.

60% of proportionate Mobilization Advance against Supply shall be adjusted while making payments of this installment. In case of delay of project, the entire mobilization advance should get recovered from the contractor as per supply and erection contracts’ works completion schedule respectively.

2.1.2. Second Installment (20%): Twenty percent (20%) payments of supply portion against various items of price schedule on pro-rata basis considering 10,000 lot each shall be paid subject to Installation, commissioning and integration with existing JKPDD applications (eg. CCB, GIS, Reporting tool etc.) in all respect and online bill generation from utility billing system for 30 days and Site Acceptance test (SAT). The requisite documents are herein under:

a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.

b. An unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 34.1, Section ITB and as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said bank guarantee shall be initially valid upto ninety (90) days after expiry of the Warranty Period and shall be extended from time to time till ninety (90) days beyond successful completion of warranty period, as may be required under the Contract.

c. Detailed Project Execution Plan/PERT chart and its approval by the Employer.

d. Evidence of dispatch (R/R or receipted L/R)

e. Contractor’s detailed invoice as per GST Act & packing list identifying contents of each shipment and credit note for LD/short supply/any other deductions.

f. Invoice certifying payments of ED, Taxes for the direct transaction between Employer and Contractor,

g. Copy of Certificate to the effect of payments of State/ Central taxes, duties, levies etc have been made against supply of materials through sub-vendors under the contract.


i. Manufacturer’s/Contractor’s guarantee certificate of Quality.

j. Material Dispatch Clearance Certificate (MDCC) / Dispatch Instructions (DI) for dispatch of materials from the manufacturer’s works. MDCC/DI shall be issued by authorized officer of Employer.
m. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.

n. Test check certification on Measurement Book be recorded by officers in hierarchy with the claim as per policy.

o. While releasing 2\textsuperscript{nd} installment of 20\% supply payment following adjustment shall be made:
   i. 20\% of proportionate initial mobilization advance shall be adjusted. Also, up-to-date accrued interest shall also be recovered.
   ii. In case of delay of project, the entire mobilization advance shall get recovered at this stage.

\textbf{2.1.3. Third Installment (10\%)}: Ten percent (10\%) payments of supply portion against various items of price schedule on pro-rata basis considering 10,000 lot each shall be paid on Completion of minimum 3 billing cycles (monthly) and User Acceptance by utility. The requisite documents are herein under:

   a. User Acceptance certificate by Utility.
   b. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.
   c. Test check certification on Measurement Book be recorded by officers in hierarchy with the claim as per policy.

While releasing this installment, following adjustment shall be made:

   i. Balance initial mobilization advance shall be adjusted. Also, up-to-date accrued interest shall also be recovered.

   In case of delay of project, the entire mobilization advance shall get recovered at this stage.

\textbf{2.1.4. Fourth Installment (10\%)}: Ten percent (10\%) payments of supply portion against various items of price schedule shall be paid on Successful completion of all responsibilities and obligations and Go-Live of the complete AMI system. The requisite documents are herein under:

   a. Utility Acceptance of complete project and Go-Live certificate of project from utility.
   b. Test check certification on Measurement Book be recorded by officers in hierarchy with the claim as per policy.

\textbf{2.2. Services}

\textbf{2.2.1. First Installment (90\%)}: Ninety percent (90\%) payments of services portion against various items of price schedule on pro-rata basis considering 10,000 lot each shall be paid subject to Installation, commissioning and integration with existing JKPDD applications (eg. CCB, GIS, BI etc.) in all respect and online bill generation from utility billing system for 30 days and Site Acceptance test (SAT).

   a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.
b. Detailed Project Execution Plan/PERT chart and its approval by the Employer.

c. An unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Erection Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 34.1, Section ITB and as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said bank guarantee shall be initially valid upto ninety (90) days after expiry of the Warranty Period and shall be extended from time to time till ninety (90) days beyond successful completion of warranty period, as may be required under the Contract.


e. Material reconciliation statement consisting of the materials utilized for erection, testing & commissioning vis-à-vis erection activity of the lot of villages.

f. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.

g. Test check certification on Measurement Book be recorded by officers in hierarchy with the claim as per policy. 

While releasing 1st installment of 90% services payment following adjustment shall be made:

i. 100% Mobilization Advance against Erection shall be fully adjusted while making payments of first installment. Also, up-to-date accrued interest shall also be recovered.

ii. In case of delay of project, the entire mobilization advance shall get recovered from the contractor as per supply and erection contracts’ works completion schedule respectively.

2.2.2. Second Installment (10%): Ten percent (10%) payments of services portion against various items of price schedule on pro-rata basis considering 10,000 lot each shall be paid on Completion of minimum 3 billing cycles (monthly) and User Acceptance by utility.

a. On submission of the certificate by the Project Manager that the equipment/materials have been erected, tested and commissioned.

b. On certification by Project Manager for validity of an unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 34.1, Section ITB and as per proforma attached with Section-VI of Vol.-I (Conditions of Contract). The said bank guarantee shall be initially valid upto ninety (90) days after expiry of the Warranty Period and shall be extended from time to time till ninety (90) days beyond successful completion of warranty period, as may be required under the Contract.

c. On certification of Project Manager for reconciliation of materials and payments.

d. On certification of Project Manager that assets under the project are created and are taken over by Employer.

3. FMS Payment

FMS Payment will be done on Quarterly basis at the end of each quarter on satisfactory completion of Facility Management Services subject to Project manager certification of required services.
Appendix-2 : PRICE ADJUSTMENT - NA
Appendix-3 : INSURANCE REQUIREMENTS

A) Insurances to be taken out by the Contractor

In accordance with the provisions of GCC Clause 30, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld. The inability of the insurers to provide insurance cover in the sums and with the deductibles and other conditions as set forth below, shall not absolve the Contractor of his risks and liabilities under the provisions of GCC Clause 30. However, in such a case the Contractor shall be required to furnish to the Employer documentary evidence from the insurer in support of the insurer’s inability as aforesaid.

(a) Marine Cargo Policy/Transit Insurance Policy:

(I) Transit Insurance Policy for indigenous equipment

Similarly, Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment supplied from within India. The policy shall cover movement of Plant and Equipment from the manufacturer’s works to the project’s warehouse at final destination site. Inland Transit Clause (ITC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible Limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>120% of supply Price of all the Plant and Equipment to be supplied from within India plus Excise Duty and Sales Tax/ VAT etc., if additionally payable.</td>
<td>Nil</td>
<td>Contractor &amp; Employer</td>
<td>Mfrs warehouse</td>
<td>Project’s warehouse store at final destination</td>
</tr>
</tbody>
</table>

(II) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(III) The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.

(b) Erection All Risk Policy/Contractor All Risk Policy:

(I) The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>
105% of supply Price of all the Plant and Equipment to be supplied from within India plus Excise Duty and Sales Tax/ VAT etc., if additionally payable. and 100% of erection price component

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
</table>
| For projects upto Rs. 100 crores, the third party liability limit shall be 10% of the project value for single occurrence/multiple occurrences in aggregate during the entire policy period.  
For projects from Rs. 100 crores to Rs. 500 crores, the third party liability limit shall be Rs. 10 crores for single occurrence/multiple occurrences in aggregate during entire policy period. For projects of more than Rs.500 crores, the | Nil               | Contractor/ Sub-contractor | Receipt at site | Upto Defect Liability Period. |
(V) As per GCC Clause 30.8, the cost of insurance premium is to be reimbursed to the Contractor for Owner Supplied Materials (OSM) for which the insurer is to be finalized by the Contractor as detailed therein. Alternatively, the Contractor may take a single policy covering the entire cost of the project including the cost of OSM. For this purpose, the Contractor shall submit documentary evidence for the premium paid for the entire project to the Employer and Employer shall reimburse to the Contractor the proportion of premium equal to value of OSM to total sum insured.

If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

c) **Automobile Liability Insurance**

The Contractor shall ensure that all the vehicles deployed by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its Subcontractors may also take comprehensive policy (own damage plus third party liability) of each individual vehicles deployed in the project on their own discretion in their own name to protect their own interest.

d) **Workmen Compensation Policy:**

(I) Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its Subcontractors for the project are adequately covered under the policy.

(II) The policy may either be project specific covering all men of the Contractor and its Subcontractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing ‘Workmen Compensation Policy’ for all its employees including that of the Subcontractor(s), the Contractor must include the interest of the Employer for this specific Project in its existing ‘Workmen Compensation Policy’.

(III) Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal’s statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its Subcontractors shall effect and maintain insurance on the same basis as the ‘Workmen Compensation Policy’ effected by the Contractor.

| **third party liability limit shall be Rs. 25 crores for single occurrence/multiple occurrences in aggregate during entire policy period.** |   |   |
e) **Contractor’s Plant and Machinery (CPM) Insurance**

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor’s Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1, except for the Third Party Liability, Workmen Compensation Policy Insurances, and the Contractor’s Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 30.1 except for the Cargo Insurance During Transport and Workmen Compensation Policy Insurances. All insurer’s rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

B) **Insurances to be taken out by the Employer**

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties Insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
<td>_______</td>
</tr>
</tbody>
</table>

-- End --
### Appendix-4 : TIME SCHEDULE

1. The Project Completion Schedule shall be as follows:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Activities</th>
<th>Duration in Months from the effective date of Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Taking Over by the Employer upon successful Completion of:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. PMDP &amp; IPDS Work</td>
<td>18 month (Eighteen month) with 5 years of FMS period post Go-Live</td>
</tr>
</tbody>
</table>

1.1 The activity(ies) under the Contractor’s programme for Project Completion shall be in the form a PERT chart and shall identify the various activities like engineering, vendor finalization, placement of orders to sub-vendors, survey, Resource mobilization, erection, testing & commissioning including submission of closure proposals. Format of PERT chart is enclosed at Annexure-A. The PERT Chart shall conform to the above Project Completion Schedule.

This PERT Chart shall be discussed and agreed before Award in line with above, engineering drawing and data submission schedule shall also be discussed and finalised before Award. Liquidated damages for delay in successful Completion of the Facilities or specific part thereof (where specific parts are specified in SCC) and Operational Acceptance at rates specified in Clause 21 of GCC shall be applicable beyond the date specified above.

1.2 The Employer reserves the right to request minor changes in the work schedule at the time of Award of Contract to the successful Bidder.

1.3 The successful Bidder shall be required to prepare detailed PERT Chart and finalise the same with the Employer as per the requirement, which shall from a part of the Contract.
Appendix-5 : LIST OF APPROVED SUBCONTRACTORS - NA
**Appendix-6: SCOPE OF WORKS AND SUPPLY BY THE EMPLOYER**

The following personnel, facilities, works and supplies will be provided/supplied by the Employer, and the provisions of GCC 6, 16, 17 and 20 as well as Employer responsibilities stated in technical specifications shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Sub-Clause 14.2.

Unless otherwise indicated, all personnel, facilities, works and supplies will be provided free of charge to the Contractor.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Charge to Contractor – None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>Charge to Contractor - None except as noted</td>
</tr>
<tr>
<td>Electricity and Water</td>
<td>Charge to Contractor - as noted</td>
</tr>
</tbody>
</table>

The Contractor shall be entitled to use for the purposes of the facilities such supplies of electricity and water as may be available on the Site and shall provide any apparatus necessary for such use. The Contractor shall pay the Employer at the applicable tariff plus Employer's overheads, if any, for such use. Where such supplies are not available, the Contractor shall make his own arrangement for provision of any supplies he may require.

<table>
<thead>
<tr>
<th>Works</th>
<th>Charge to Contractor - None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies</td>
<td>Charge to Contractor – None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplies</th>
<th>Charge to Contractor – None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Supplies</th>
<th>Charge to Contractor – None</th>
</tr>
</thead>
</table>

---

**Sample Forms and Procedures**

---
Appendix-7 : LIST OF DOCUMENTS FOR APPROVAL OR REVIEW

Pursuant to GCC Sub-Clause 16.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GCC Sub-Clause 14.2 (Program of Performance), the following documents for:

A. Approval
   1. 
   2. 
   3. 

B. Review
   1. 
   2. 
   3. 

Note:

Bidder shall furnish the exhaustive list, which shall be discussed and finalised for incorporation into the Contract Agreement.
Appendix-8: GUARANTEES, LIQUIDATED DAMAGES FOR NON – PERFORMANCE

1. The equipment offered shall meet the rating and performance requirements stipulated in Technical Specification for various equipment or indicated in Data requirement.

2. The ratings and performance figures of the below mentioned equipment are guaranteed as per losses given in respective Indian Standard (up to date) by bidder.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Single phase two Wire, 10-60 A static smart meters of accuracy class 1.0</td>
</tr>
<tr>
<td>B.</td>
<td>Single phase two Wire, 5-30 A static smart meters of accuracy class 1.0</td>
</tr>
<tr>
<td>C.</td>
<td>Three phase four Wire, 3x230 voltage, 20-80A, whole current static smart meters of accuracy class 1.0</td>
</tr>
</tbody>
</table>

3. If the aforementioned guarantees are not established at factory tests, then the Employer shall reject the equipment.
6. PERFORMANCE SECURITY FORM

Bank Guarantee No. .......................... Date..................

Contract No......................................

.............[Name of Contract]..............

To: [Name and address of Employer]

Dear [Name and address of Employer],

We refer to the Contract ("the Contract") signed on ..............(insert date of the Contract)........ between M/s. XXXX (Name of Employer), having its Registered Office at XXXX (Registered Address of employer) ("the Employer") on behalf of XXXX (Name of owner) (hereinafter referred to as 'XXXX (Short Name of Owner) / 'Owner'), and M/s ................. (Name of Contractor) .................., having its Principal place of business at ..........(Address of Contractor) ................. and Registered Office at ..........(Registered address of Contractor) ........................................................................................ ("the Contractor") concerning ................. (Indicate brief scope of work) ......................... for the complete execution of the ..... (insert name of Package alongwith name of the Project)....... [Applicable for Bank Guarantees issued by Contractor/Associate for those Contracts awarded to them]

Or

We refer to the Contract signed on ..............(insert date of the Contract)........ between M/s. XXXX (Name of Employer), having its Registered Office at XXXX (Registered Address of employer) ("the Employer") on behalf of XXXX (Name of owner) (hereinafter referred to as 'XXXX (Short Name of Owner) / 'Owner'), and M/s ................. (Name of Contractor) .................., having its Principal place of business at ..........(Address of Contractor) ................. and Registered Office at ..........(Registered address of Contractor) ........................................................................................ ("the Contractor") and the Contract ("the Contract") signed on ..............(insert date of the Contract)........ between XXXX (Name of Employer) on behalf of Owner and M/s ................. (Name of Associate) ................., having its Principal place of business at ..........(Address of Associate) ................. and Registered Office at ..........(Registered address of Associate) ........................................................................................, the Associate of the Contractor for executing the Facilities concerning ................. (Indicate brief scope of work) ......................... for the complete execution of the ..... (insert name of Package alongwith name of the Project)........ [Applicable for Bank Guarantees to be issued by Contractor against those Contracts awarded to their Associate]

By this letter we, the undersigned, ...........(insert name & address of the issuing bank) ........, a Bank (which expression shall include its successors, administrators, executors and assignes) organized under the laws of ................................ and having its Registered/Head Office at ..........(insert address of registered office of the bank)........ do hereby irrevocably guarantee payment to the Employer up to ......................... i.e., Ten percent (10%) of the Contract Price until ninety (90) days beyond the Defect Liability Period i.e., upto and inclusive of ............ (dd/mm/yy).

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by the Employer duly authorized officer or the authorized officer of Owner declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to the Employer whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to
expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until ninety (90) days beyond the Defect Liability Period of the Facilities i.e. upto and inclusive of ................. (dd/mm/yy) and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s. ......................... on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to the Employer shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_______________________
Name_______________________
Designation_______________________
POA Number_______________________
Contact Number(s): Tel.______________Mobile______________
Fax Number_______________________
email ____________________________
Common Seal of the Bank______________________
Witness:
Signature_______________________
Name_______________________
Address__________________________
Contact Number(s): Tel.______________Mobile______________

IPDS & PMRP /SBD/R1
Note:

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph for limitation of liability, the following may be added at the end of the proforma of the Bank Guarantee [i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee]:

Quote

"Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _______ (value in figures)_________ [_____________________ (value in words)_________________].

2. This Bank Guarantee shall be valid upto ________ (validity date)__________.

3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before ________ (validity date)__________.

Unquote
7. BANK GUARANTEE FORM FOR ADVANCE PAYMENT

Bank Guarantee No. ............................... Date............................

Contract No........................................

.................................[Name of Contract]............................

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on ............(insert date of the Contract)....... between you and M/s ............... (Name of Contractor) .................., having its Principal place of business at ...........(Address of Contractor) ............................ and Registered Office at ...........(Registered address of Contractor) .............................................. ("the Contractor") concerning .................

(Indicate brief scope of work) ................. for the complete execution of the ...... (insert name of Package alongwith name of the Project)......

Whereas, in accordance with the terms of the said Contract, the Employer has agreed to pay or cause to be paid to the Contractor an Advance Payment in the amount of ...........(Amount in figures and words).............

By this letter we, the undersigned, ...........(insert name & address of the issuing bank) ..........., a Bank (which expression shall include its successors, administrators, executors and assigns) organized under the laws of .................................... and having its Registered/Head Office at ...........(insert address of registered office of the bank)..........., do hereby irrevocably guarantee repayment of the said amounts upon the first demand of the Employer without cavil or argument in the event that the Contractor fails to commence or fulfill its obligations under the terms of the said Contract, and in the event of such failure, refuses to repay all or part (as the case may be) of the said advance payment to the Employer.

Provided always that the Bank’s obligation shall be limited to an amount equal to the outstanding balance of the advance payment, taking into account such amounts, which have been repaid by the Contractor from time to time in accordance with the terms of payment of the said Contract as evidenced by appropriate payment certificates.

This Guarantee shall remain in full force from the date upon which the said advance payment is received by the Contractor upto ninety (90) days beyond the date on which the entire advance so advanced alongwith the interest if any due thereon has been fully adjusted in terms of the Contract i.e., upto of ninety (90) days beyond the date of Completion of the Facilities under the Contract. This Guarantee may be extended from time to time, as may be desired by M/s. ............................ on whose behalf this Guarantee has been issued.

Any claims to be made under this Guarantee must be received by the Bank during its period of validity, i.e. upto ninety (90) days beyond the date of Completion of the Facilities by the Employer i.e. upto and inclusive of ............ (dd/mm/yy).

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature__________________________________________

IPDS & PMRP /SBD/R1

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Note:

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of the bank who issues the 'Bank Guarantee'.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph for limitation of liability, the following may be added at the end of the proforma of the Bank Guarantee [i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee]:

Quote

"Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _______ (value in figures)________. [________ (value in words)________].

2. This Bank Guarantee shall be valid upto _______ (validity date)________.

3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _______ (validity date)________."

Unquote
8. FORM OF TAKING OVER CERTIFICATE

Date..................
Name of Contract..........................................
Contract No........................................

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 20 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated ………………… relating to the ………………………. (insert brief description of the Facilities)………………………………………………… we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below:

1. Description of the Facilities or part thereof ............................................................
2. Date of Completion :........................................................

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)
9. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY .....(abbreviated name of the Employer)...... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this............... day of ........ 20..... by .................................. a Company registered under the Companies Act, 1956/2013 (with amendment from time to time)/Partnership firm/proprietary concern having its Registered Office at....................(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of ........... (insert name of the Employer)....... a Company incorporated under the Companies Act, 1956/2013 (with amendment from time to time) having its Registered Office at ...............(insert registered address of the Employer) and its project at ....................... (hereinafter called "......(abbreviated name of the Employer)........" which expression shall include its successors and assigns):

WHEREAS ......(abbreviated name of the Employer)....... has awarded to the Contractor a Contract for............ vide its Notification of Award/Contract No..………......... dated........... and its Amendment No. ………........... (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which ......(abbreviated name of the Employer)....... is required to hand over various Equipment to the Contractor for the purpose of performance of the Contract.

And WHEREAS by virtue of Clause No.............of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of ......(abbreviated name of the Employer)....... for the Equipment handed over to it by ......(abbreviated name of the Employer)....... for the purpose of performance of the Contract/Erection portion of the contract (hereinafter called the "Equipment").

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipment as mentioned in the Contract, valued at (amount in words………………………………………………) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep ......(abbreviated name of the Employer)....... indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per despatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the despatch title documents in respect of the said Equipments duly endorsed by ......(abbreviated name of the Employer)....... in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment in trust as a Trustee for and on behalf of ......(abbreviated name of the Employer).......  

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at ......(abbreviated name of the Employer)....... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by ......(abbreviated name of the Employer)....... The Contractor undertakes to keep ......(abbreviated name of the Employer)....... harmless against any loss or damage that may be caused to the Equipment.

3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
4. That ......(*abbreviated name of the Employer)....... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employee or Employer's Representative in this regard. Further, ......(*abbreviated name of the Employer)....... shall always be free at all times to take possession of the Equipment in whatever form the equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of ......(*abbreviated name of the Employer)....... to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at his own cost and/or shall pay the amount of loss to ......(*abbreviated name of the Employer)....... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to ......(*abbreviated name of the Employer)....... against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of ......(*abbreviated name of the Employer)....... THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

<table>
<thead>
<tr>
<th>Particulars of the Equipment handed over</th>
<th>Quantity</th>
<th>Particulars of Despatch title Documents</th>
<th>Value of the Equipment</th>
<th>Signature of the Attorney in token of receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RR/GR No. date of lading</td>
<td>Carrier</td>
<td></td>
</tr>
</tbody>
</table>

For and on behalf of
M/s....................................................

WITNESS

1. Signature........................................ Signature........................................
   Name........................................... Name...........................................
   Address........................................ Address........................................

2. Signature........................................ Authorised representative
   Name........................................... (Common Seal)
   Address........................................ (In case of Company)
Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.
10. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS BY .....(abbreviated name of the Employer)....... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this ..................... day of ............. 20...... by ................................ a Company registered under the Companies Act, 1956/2013 (with amendment from time to time)/Partnership firm/proprietary concern having its Registered Office at ..........................(hereinafter called as 'Contractor' or 'Obligor' which expression shall include its successors and permitted assigns) in favour of ......(insert name of the Employer)........, a company incorporated under the Companies Act, 1956/2013 (with amendment from time to time) having its Registered Office at ......(insert registered address of the Employer)....... and its project at ......................... (hereinafter called "......(abbreviated name of the Employer)......." which expression shall include its successors and assigns):

WHEREAS ......(abbreviated name of the Employer)....... has awarded to the Contractor a Contract for ..................vide its Notification of Award/Contract No. ................. dated .................and Amendment No. ...................... (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which ......(abbreviated name of the Employer)....... is required to handover various Equipment to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No...........of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of ......(abbreviated name of the Employer)....... for the Equipment handed over to it by ......(abbreviated name of the Employer)....... for the purpose of performance of the contract/Erection portion of the Contract (hereinafter called the "Equipment").

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words ..................) to be handed over to the Contractor in installments from time to time for the purpose of performance of the contract, the Contractor hereby undertakes to indemnify and shall keep ......(abbreviated name of the Employer)....... indemnified, for the full value of Equipment. The Contractor hereby acknowledges receipt of the initial installment of the equipment per details in the schedule appended hereto. Further, the Contractor agrees to acknowledge receipt of the subsequent installments of the Equipment as required by ......(abbreviated name of the Employer)....... in the form of Schedules consecutively numbered which shall be attached to this Indemnity bond so as to form integral parts of this Bond. It is expressly understood by the Contractor that handing over the despatch title documents in respect of the said Equipments duly endorsed by ......(abbreviated name of the Employer)....... in favour of the Contractor shall be construed as handing over the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipments in trust as a Trustee for and on behalf of ......(abbreviated name of the Employer)....... 

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at ......(abbreviated name of the Employer)....... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by ......(abbreviated name of the Employer)....... The Contractor undertakes to keep ......(abbreviated name of the Employer)....... harmless against any loss or damage that may be caused to the Equipment.

3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia
constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.

4. That .......(abbreviated name of the Employer)......... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employer or Employer’s Representative in this regard. Further, .......(abbreviated name of the Employer)......... shall always be free at all times to take possession of the Equipment in whatever form the Equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of .......(abbreviated name of the Employer)......... to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer’s Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss to .......(abbreviated name of the Employer)......... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to .......(abbreviated name of the Employer)......... against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of .......(abbreviated name of the Employer)........., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE No. 1

<table>
<thead>
<tr>
<th>Particulars of the Equipment handed over</th>
<th>Quantity</th>
<th>Particulars of Despatch title Documents</th>
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<td>date of lading</td>
<td>Carrier</td>
</tr>
</tbody>
</table>

For and on behalf of

M/s...........................................

WITNESS

1. Signature.................................. Signature..................................
   Name...................................... Name......................................
   Address................................... Address...................................

2. Signature.................................. Authorised representative
Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.
11. FORM OF AUTHORISATION LETTER

Ref. No:

Date:

To

M/s..................................................
 ..........................................................
 ..........................................................
 ..........................................................

REF.: Contract No. ..................... dated .................. for ...................................... awarded by ....(insert name of the Employer) ..........

Dear Sir,

Kindly refer to Contract No. .................... dated .................. for ....................... You are hereby authorised on behalf of .................. (Name of Employer) .............. a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Registered Office at .......... (registered address of the Employer) ............. and its Project at ............ to take physical delivery of materials/equipments 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.

(Signature of Project Authority) **

Designation..............................

Date............... ........................................

Encl: As Above.

** To be signed not below the rank of Manager.

* Mention LR/RR No.

Schedule of Material/Equipment covered under Despatch Title Document (RR No./LR No. ..............)

<table>
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(Signature of the Project Authority) 

(Designation) ..................................  

(Date) ...........................................
12. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED

We M/s. ...............(insert name of the Contractor) ............... having our Principal place of business at ........................................ having been awarded a Contract No. .................................. dated ................................... for ........
(insert Package name along with name of the Project) ........................................ by ...............(insert name of the Employer) .........................

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR etc. and in the schedule annexed hereto, which shall form an integral part of this receipt as “Trustee” of ............... (insert name of the Employer) ............... The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid Contract and for no other purpose whatsoever. We undertake not to create any charge, lien or encumbrance over the aforesaid materials etc. in favour of any other person/institution(s)/Banks.

For M/s ......................................................
(Contractor's Name)

Dated : ..............................
(AUTHORISED SIGNATORY)

Place : ..............................
SEAL OF COMPANY
13. FORM OF EXTENSION OF BANK GUARANTEE

Ref. No................................ Dated:.................

To: [Name and address of the Employer]

Dear Sirs,

Sub.: Extension of Bank Guarantee No. …………… dated ……….., issued to you on behalf of M/s. ……… (insert name of the Contractor) ……………, in respect of Contract No. …………… dated …………… for ……… (insert name of the Package alongwith the Project name) ……… (hereinafter called original Bank Guarantee).

At the request of M/s.……….. (insert name of the Contractor) ……………, We ……… (insert name & address of the issuing bank) …….., a Bank organized under the laws of ……………………… and having its Registered/Head Office at ……….. (insert address of registered office of the bank) ……………. do hereby extend our liability under the above-mentioned Guarantee No. ………………............. Dated ............. for a further period of …………… Years/Months from …………… to expire on ……………. Except as provided above, all other terms and conditions of the original Bank Guarantee No. ………………............. dated …………… shall remain unaltered and binding.

Please treat this as an integral part of the original Guarantee to which it would be attached.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_______________________
Name_______________________
Designation_______________________
POA Number_______________________

Contact Number(s): Tel.______________Mobile______________
Fax Number_______________________
email ____________________________

Common Seal of the Bank______________________

Witness:

Signature_______________________
Name_______________________
Address_______________________

Contact Number(s): Tel.______________Mobile______________
email ____________________________

IPDS & PMRP /SBD/R1
Note:

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the ‘Bank Guarantee’.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.
14. FORM OF POWER OF ATTORNEY FOR CONSORTIUM

KNOW ALL MEN BY THESE PRESENTS THAT WE, the Partners whose details are given hereunder ................................................................. have formed a consortium under the laws of ................................................ and having our Registered Office(s)/Head Office(s) at ............................................ (hereinafter called the ‘Consortium’ which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s ................................................................. being the Partner in-charge do hereby constitute, nominate and appoint M/s................................................... a Company incorporated under the laws of ................................................................. and having its Registered/Head Office at ........................................... as our duly constituted lawful Attorney (hereinafter called “Attorney” or “Authorised Representative” or “Partner In-charge”) to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Specification No............................ Package ............................ the bids for which have been invited by ……… (insert name of the Employer along with address) ………… (hereinafter called the 'Employer') to undertake the following acts:

i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the "Consortium”.

ii) To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the "Consortium”.

iii) To do any other act or submit any document related to the above.

iv) To receive, accept and execute the Contract for and on behalf of the "Consortium”.

It is clearly understood that the Partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The Consortium hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorised Representatives/Partner in-charge quotes in the bid, negotiates and signs the Contract with the Employer and/or proposes to act on behalf of the Consortium by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Consortium as aforesaid have executed these presents on this ........... day of ................. under the Common Seal(s) of their Companies.

for and on behalf of the Partners of Consortium

.........................................................

.........................................................

.........................................................

The Seal of the above Partners of the Consortium:

.........................................................

.........................................................
The Seal of the above Partners of the Consortium:

The Seal has been affixed there unto in the presence of:

WITNESS

1. Signature......................................................
   Name ........................................................
   Designation ............................................
   Occupation .............................................

2. Signature......................................................
   Name ........................................................
   Designation ............................................
   Occupation .............................................

Note:
1. For the purpose of executing the Agreement, the non-judicial stamp papers of appropriate value shall be purchased in the name of Lead Member of Consortium.

2. The Agreement shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
15. FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS

<To be edited and submitted as relevant for Consortium partners>

THIS JOINT DEED OF UNDERTAKING executed on this........... day of........... Two Thousand and............. by ................................................................................................................. a company incorporated under the laws of ......................... having its Registered Office at .............................................. (hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s................. another company incorporated under the laws of ......................... having its Registered Office at .................. (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s...... a company incorporated under the laws of ......................... having its Registered Office at .................. (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" (in case of award)] against the Specification No................. for ...... (insert name of the package alongwith project name) .......... of ...... (insert names of the Employer) .........., a Company incorporated under the Companies Act of 1956/2013 (with amendment from time to time) having its registered office at ..............(insert registered address of the Employer) (hereinafter called the "Employer").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated................

AND WHEREAS the Employer invited bids as per the above mentioned Specification for the design, manufacture, supply, erection, testing and commissioning of Equipment/ Materials stipulated in the Bidding Documents under ...... (insert name of the package alongwith project name) ..........

AND WHEREAS Clause 9.3, Section-ITB and BDS (documents establishing the Qualification of Bidder) & Qualification Criteria in Annexure-A to BDS forming part of the Bidding Documents, inter-alia stipulates that an Undertaking of two or more qualified manufacturers as partners, meeting the requirements of Qualification Criteria in Annexure-A to BDS, as applicable may bid, provided, the Joint Venture fulfills all other requirements under Clause 9.3 (c) of ITB and Qualification Criteria in Annexure-A to BDS and in such a case, the Bid Forms shall be signed by all the partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that this Undertaking shall be attached to the bid and the Contract performance guarantee will be as per the format enclosed with the Bidding Documents without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.........................dated ............ by Party No.1 based on this Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Clause 9.3, Section-ITB and BDS (documents establishing the Qualification of Bidder) & Qualification Criteria in Annexure-A to BDS, has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s............. the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, manufacture, supply and successful performance of the equipment in accordance with the Contract.

2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract.
and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.

3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.

4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims rising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.

5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in Appendix – I (to be suitably appended by the Parties alongwith this Undertaking in its bid) to this Deed of Undertaking. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.

6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.

7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.

8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.

9. It is further agreed that this Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorised representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of .............................. For Lead Partner (Party No.-1)
has been affixed in my/ our presence pursuant to Board of
Director’s Resolution dated .................

Name .................................

Designation ...........................

(Signature of the authorized
Signature .................

WITNESS:

I. .........................

II. ........................

Common Seal of ....................... For Party No.-2
has been affixed in my/ our For and on behalf of M/s..................
presence pursuant to Board of
Director’s Resolution dated ..............

Name ......................

Designation .....................

Signature .....................

WITNESS:

I. .........................

II. ........................

Common Seal of ....................... For Party No.-3
has been affixed in my/ our For and on behalf of M/s.
presence pursuant to Board of ..................
Director’s Resolution dated ..............

Name ......................

Designation .....................

Signature .....................

WITNESS:

I. .........................

II. ........................

Note:
1. For the purpose of executing the Joint Deed of Undertaking, the non-judicial stamp papers of
appropriate value shall be purchased in the name of Joint Venture.

2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the
partners and should invariably be witnessed.
16. FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT/FACILITIES

BANK CERTIFICATE

This is to certify that M/s. ___________________ (insert Name & Address of the Contractor) _________ who have submitted their bid to …………..(insert name of the Employer)…………….. against their tender specification Vide ref. No. ……………………… for ………… (insert name of the package alongwith the project name) …………… is our customer for the past ………………… years.

Their financial transaction with our Bank have been satisfactory. They enjoy the following fund based and non fund based limits including for guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

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This letter is issued at the request of M/s. ______________.

Signature ______________________

Name of Bank __________________

Name of Authorised Signatory

Designation ___________________

Phone No. _____________________

Address _______________________

SEAL OF THE BANK
17. FORM OF OPERATIONAL ACCEPTANCE

Date..................

Name of Contract..........................................

Contract No......................................

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 20 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated ............... relating to the ......................, (insert brief description of the Facilities) .................. we hereby notify you that the System tests and Acceptance tests of the following part(s) of the Facilities were satisfactorily completed on the date specified below:

1. Description of the Facilities or part thereof ..........................................................................

2. Date of Operational Acceptance: ........................................................

This letter does not relieve you of your obligation during the Defects Liability Period and Latent Defect warranty.

Very truly yours,

Title
(Project Manager)
18. FORM OF SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR WITHIN SIXTY DAYS OF AWARD OF CONTRACT

[TO BE EXECUTED ON A NON JUDICIAL STAMP PAPER WORTH RS. TWENTY ONLY]

SAFETY PLAN

THIS SAFETY PLAN is made this ................. day of ........... 20...... by .............................. a Company registered under the Companies Act, 1956/2013 (with amendment from time to time)/Partnership firm/proprietary concern having its Registered Office at ...........................[to be modified suitably for JV Contractor] (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of ......(insert name of the Employer)........., a company incorporated under the Companies Act, 1956/2013 (with amendment from time to time) having its Registered Office at ......(insert registered address of the Employer)........ for its Contract for ......................... ......(insert package name, project name alongwith Specification number of the Contract)........

WHEREAS ......(abbreviated name of the Employer)....... has awarded to the Contractor the aforesaid Contract vide its Notification of Award/Contract No. ..........……... .... dated .......and Amendment No. ................. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' alongwith certain documents to the Engineer In-Charge/Project Manager of the Employer within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.

2. THAT the Contractor shall execute the works in a well planned manner from the commencement of Contract as per agreed mile stones of work completion schedule so that planning and execution of construction works goes smoothly and consistently through out the contract duration without handling pressure in last quarter of the financial year/last months of the Contract and the shall be finalized in association with XXXX (Name of Employer) Engineer In-charge/Project Manager from time to time as required.

3. THAT the Contractor has prepared the safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site, which is enclosed at Annexure – 1A (SP) for acceptance and approval of Engineer In-charge/Project Manager. The Contractor shall ensure that on approval of the same from Engineer In-charge/Project Manager , the approved copies will be circulated to Employer’s personnel at site [Supervisor(s)/Executive(s)] and Contractor’s personnel at site [Gang leader, supervisor(s) etc.] in their local language / language understood by gang.

THAT the Contractor has prepared minimum manpower deployment plan, activity wise as stated above, which is enclosed at Annexure – 1B (SP) for approval of Engineer In-charge/Project Manager.

4. THAT the Contractor shall ensure while executing works that they will deploy minimum 25% of their own experienced work force who are on the permanent roll of the company and balance 75% can be a suitable mixed with the hired gangs / local workers / casual workers if required. The above balance 75% work force should be provided with at least 10 days training by the construction agencies at sites and shall be issued with a certificate. No worker shall be engaged without a valid certificate. Hired gang workers shall also follow safe working procedures and safety norms as is being followed by company’s workmen. It should also be ensured by the contractor that certified workers fitters who are climbing towers / doing stringing operations can be easily identifiable with a system like issue of Badge / Identification cards (ID cards) etc. Colour identification batches should be worn by the workers.
Contractor has to ensure that inexperience workers / unskilled workers should not be deployed for skilled job.

5. THAT the Contractor’s Gang leader / Supervisor / Senior most member available at every construction site shall brief to each worker daily before start of work about safety requirement and warn about imminent dangers and precautions to be taken against the imminent dangers (Daily Safety Drill). This is to be ensured without fail by Contractor and maintain record of each gang about daily safety instructions issued to workers and put up to XXXX(Name of Employer) site In-charge for his review and record.

6. THAT the Contractor shall ensure that working Gangs at site should not be left at the discretion of their Gang Leaders who are generally hired and having little knowledge about safety. Gang leader should be experienced and well versed with the safe working procedures applicable for transmission line/ Sub Station works. In case gang is having Gang leader not on permanent roll of the company then additional Supervisor from company’s own roll having thorough knowledge about the works would be deployed so as to percolate safety instructions upto the grass root level in healthy spirits. Contractor has to ensure close supervision while executing critical locations of transmission lines / sub stations and ensures that all safety instructions are in place and are being followed.

7. THAT the Contractor shall maintain in healthy and working condition all kind of Equipments / Machineries / Lifting tools / Lifting tackle / Lifting gears / All kind of Ropes including wire ropes / Polypropylene ropes etc. used for Lifting purpose during execution of the project and get them periodically examined and load tested for safe working load in accordance with relevant provisions and requirement of Building & other construction workers Regulation of Employment and Conditions of Services Act and Central Rule 1998 or latest, Factories Act 1948 or latest, Indian Electricity Act 2003 before start of the project. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by the Engineer In-charge/Project Manager or by the person authorised by him. The Contractor has to ensure to give special attention on the formation / condition of eye splices of wire rope slings as per requirement of IS 2762 Specification for wire rope slings and sling legs.

THAT the Contractor has prepared a list of all Lifting machines, lifting Tools / Lifting Tackles / Lifting Gears etc. / All types of ropes and Slings which are subject to safe working load is enclosed at Annexure – 2 (SP) for review and approval of Engineer In-charge/Project Manager.

8. THAT the Contractor has to procure sufficient quantity of Personal Protective Equipment (PPE) conforming to Indian / International standards and provide these equipment to every workman at site as per need and to the satisfaction of Engineer-in-charge/Project Manager of XXXX (Name of the Employer). The Contractor’s Site Supervisor/ Project Manager has to ensure that all workmen must use Personal Protective Equipment at site. The Contractor shall also ensure that Industrial Safety helmets are being used by all workmen at site irrespective of their working (at height or on ground). The Contractor shall further ensure use of safety shoes by all ground level workers and canvas shoes for all workers working at height, Rubber Gum Boots for workers working in rainy season and concreting job, Use of Twin Lanyard Full body Safety Harness with attachment of light weight such as aluminium alloy etc. and having features of automatic locking arrangement of snap hook, by all workers working at height for more than three meters and also for horizontal movement on tower shall be ensured by contractor. The Contractor shall not use ordinary half body safety harness at site. The Contractor has to ensure use of Retractable type fall arrestors by workers for ascending / descending on suspension insulator string and other similar works etc., Use of Mobile fall arrestor for ascending / descending from tower by all workers. The contractor has to provide cotton / leather hand gloves as per requirement, Electrical Resistance Hand gloves for operating electrical installations / switches, Face shield for protecting eyes while doing welding works and Dust masks to workers as per requirement. The Contractor will have to take action against the workers not using Personal Protective Equipment at site and those workers shall be asked to rest for that day and also their Salary be deducted for that day. XXXX (Name of the Employer) may issue warning letter to Project Manager of contractor in violation of above norms.
THAT the Contractor shall prepare a detailed list of PPEs, activity wise, to commensurate with manpower deployed, which is enclosed at Annexure – 3 (SP) for review and approval of Engineer In-charge/Project Manager. It shall also be ensured that the sample of these equipment shall be got approved from XXXX (Name of the Employer) supervisory staff before being distributed to workers. The contractor shall submit relevant test certificates as per IS / International Standard as applicable to PPEs used during execution of work. All the PPE’s to be distributed to the workers shall be checked by XXXX (Name of the Employer) supervisory staff before its usage.

The Contractor also agrees for addition / modification to the list of PPE, if any, as advised by Engineer In-Charge/Project Manager.

9. THAT the Contractor shall procure, if required sufficient quantity of Earthing Equipment / Earthing Devices complying with requirements of relevant IEC standards (Generally IECs standards for Earthing Equipments / Earthing Devices are – 855, 1230, 1235 etc.) and to the satisfaction of Engineer In-Charge/ Project Manager and contractor to ensures to maintained them in healthy condition.

THAT the Contractor has prepared / worked out minimum number of healthy Earthing Equipments with Earthing lead confirming to relevant IS / European standards per gang wise during stringing activity/as per requirement, which is enclosed herewith at Annexure – 4 (SP) for review and acceptance of Engineer In-Charge/ Project Manager prior to execution of work.

10. THAT the Contractor shall provide communication facilities i.e. Walky – Talkie / Mobile Phone, Display of Flags / whistles for easy communication among workers during Tower erection / stringing activity, as per requirement.

11. THAT the Contractor undertakes to deploy qualified safety personnel responsible for safety as per requirements of Employer/Statutory Authorities.

THAT the Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as qualified safety officer having diploma in safety to supervise safety aspects of the equipment and workmen who will coordinate with Engineer In-charge /Project Manager/Safety Co-ordinator of the Employer. In case of work being carried out through sub contractors the sub – contractor’s workmen / employees will also be considered as the contractor’s employees / workmen for the above purpose. If the number of workers are less than 250 then one qualified safety officer is to be deployed for each contract. He will report directly to his head of organization and not the Project Manager of contractor He shall also not be assigned any other work except assigning the work of safety. The curriculum vitae of such person shall be got cleared from XXXX (Name of the Employer) Project Manager / Construction staff.

The name and address of such safety officers of contractor will be promptly informed in writing to Engineer In-charge with a copy to safety officer - In-charge before start of work or immediately after any change of the incumbent is made during the currency of the contract. The list is enclosed at Annexure – 5A (SP).

THAT the Contractor has also prepared a list including details of Explosive Operator (if required), Safety officer / Safety supervisor / nominated person for safety for each erection / stringing gang, list of personnel trained in First Aid Techniques as well as copy of organisation structure of the Contractor in regard to safety. The list is enclosed at Annexure – 5B (SP).

12. The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of
work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.

13. THAT, if, any Employer’s Engineer/ supervisor at site observes that the Contractor is failing to provide safe working environment at site as per agreed Safety Plan / XXXX (Name of the Employer) Safety Rule/ Safety Instructions / Statutory safety requirement and creates hazardous conditions at site and there is possibility of an accident to workmen or workmen of the other contractor or public or the work is being carried out in an unsafe manner or he continues to work even after being instructed to stop the work by Engineer / Supervisor at site / RHQ / Corp. Centre, the Contractor shall be bound to pay a penalty of Rs. 10,000/- per incident per day till the instructions are complied and as certified by Engineer / Supervisor of Employer at site. The work will remain suspended and no activity will take place without compliance and obtaining clearance / certification of the Site Engineer / Supervisor of the Employer to start the work.

14. THAT, if the investigation committee of Employer observes any accident or the Engineer In-charge/Project Manager of the Employer based on the report of the Engineer/Supervisor of the Employer at site observes any failure on the Contractor’s part to comply with safety requirement / safety rules/ safety standards/ safety instruction as prescribed by the Employer or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the Contractor does not take adequate steps to prevent hazardous conditions which may cause injury to its own Contractor’s employees or employee of any other Contractors or Employer or any other person at site or adjacent thereto, or public involvement because of the Contractor’s negligence of safety norms, the Contractor shall be liable to pay a compensation of Rs. 10,00,000/- (Rupees Ten Lakh only) per person affected causing death and Rs. 1,00,000/- (Rupees One Lakh only) per person for serious injuries / 25% or more permanent disability to the Employer for further disbursement to the deceased family/ Injured persons. The permanent disability has the same meaning as indicated in Workmen’s Compensation Act 1923 or latest. The above stipulations is in addition to all other compensation payable to sufferer as per workmen compensation Act / Rules

THAT as per the Employer’s instructions, the Contractor agrees that this amount shall be deducted from their running bill(s) immediately after the accident, That the Contractor understands that this amount shall be over and above the compensation amount liable to be paid as per the Workmen’s Compensation Act /other statutory requirement/ provisions of the Bidding Documents.

15. THAT the Contractor shall submit Near-Miss-Accident report alongwith action plan for avoidance such incidence /accidents to Engineer – In-charge/ Project Manager. Contractor shall also submit Monthly Safety Activities report to Engineer – In-charge/ Project Manager and copy of the Monthly Safety Activities report also to be sent to Safety In-charge at RHQ of the Employer for his review record and instructions.

16. THAT the Contractor is submitting a copy of Safety Policy/ Safety Documents of its Company which is enclosed at Annexure – 6 (SP) and ensure that the safety Policy and safety documents are implemented in healthy spirit.

17. THAT the Contractor shall make available of First Aid Box [Contents of which shall be as per Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Rule 1998 or latest / XXXX (Name of the Employer) Guidelines)] to the satisfaction of Engineer In-Charge/ Project Manager with each gang at site and not at camp and ensures that trained persons in First Aid Techniques with each gang before execution of work.

18. THAT the Contractor shall submit an ‘Emergency Preparedness Plan’ for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. which is enclosed at Annexure – 7 (SP) for approval of the Engineer In-Charge/ Project Manager before start of work.
19. THAT the Contractor shall organise Safety Training Programs on Safety, Health and Environment and for safe execution of different activities of works i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. for their own employees including sub-contractor workers on regular basis.

The Contractor, therefore, submits copy of the module of training program, enclosed at Annexure – 9 (SP), to Engineer In-charge/Project Manager for its acceptance and approval and records maintained.

20. THAT the Contractor shall conduct safety audit, as per Safety Audit Check Lists enclosed at Annexure – 8 (SP), by his Safety Officer(s) every month during construction of Transmission Lines / Sub Stations / any other work and copy of the safety audit report will be forwarded to the Employer’s Engineer In-charge / Site In-charge/Project Manager for his comments and feedback. During safety audit, healthiness of all Personal Protective Equipment (PPEs) shall be checked individually by safety officer of contractor and issue a certificate of its healthiness or rejection of faulty PPEs and contractor has to ensure that all faulty PPEs and all faulty lifting tools and tackles should be destroyed in the presence of XXXX (Name of the Employer) construction staff. Contractor has to ensure that each gang be safety audited at least once in two months. During safety audit by the contractor, Safety officer’s feedback from XXXX (Name of the Employer) concerned shall be taken and recorded. The Employer’s site officials shall also conduct safety audit at their own from time to time when construction activities are under progress. Apart from above, the Employer may also conduct surveillance safety audits. The Employer may take action against the person / persons as deemed fit under various statutory acts/provisions under the Contract for any violation of safety norms / safety standards.

21. THAT the Contractor shall develop and display Safety Posters of construction activity at site and also at camp where workers are generally residing.

22. THAT the Contractor shall ensure to provide potable and safe drinking water for workers at site / at camp.

23. THAT the Contractor shall do health check up of all workers from competent agencies and reports will be submitted to Engineer In-Charge within fifteen (15) days of health check up of workers as per statutory requirement.

24. THAT the Contractor shall submit information alongwith documentary evidences in regard to compliance to various statutory requirements as applicable which are enclosed at Annexure – 10A (SP).

The Contractor shall also submit details of Insurance Policies taken by the Contractor for insurance coverage against accident for all employees are enclosed at Annexure – 10B (SP).

25. THAT a check-list in respect of aforesaid enclosures alongwith the Contractor’s remarks, wherever required, is attached as Annexure – Check List herewith.

THE CONTRACTOR shall incorporate modifications/changes in this ‘Safety Plan’ necessitated on the basis of review/comments of the Engineer In-Charge/Project Manager within fourteen (14) days of receipt of review/comments and on final approval of the Engineer In-Charge/Project Manager of this ‘Safety Plan’, the Contractor shall execute the works under the Contract as per approved ‘Safety Plan’. Further, the Contractor has also noted that the first progressive payment towards Services Contract shall be made on submission of ‘Safety Plan’ alongwith all requisite documents and approval of the same by the Engineer In-Charge/Project Manager.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.
WITNESS

1. Signature............................... Signature...............................
   Name................................. Name.................................
   Address.............................. Address..............................

2. Signature............................... Authorised representative
   Name................................. (Common Seal)
   Address.............................. (In case of Company)

Note:

All the annexure referred to in this "Safety Plan" are required to be enclosed by the contractor as per the attached "Check List".

1. Safety Plan is to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute such contract documents etc., (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to this Safety Plan.

2. For all safety monitoring/documentation, Engineer In-charge / Regional In-charge of safety at RHQ will be the nodal Officers for communication.
## CHECK LIST FOR SAFETY PLAN

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Details of Enclosure</th>
<th>Status of Submission of information/documents</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Annexure – 1A (SP)</strong>&lt;br&gt;Safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing &amp; commissioning, disposal of materials at site / store etc. to be executed at site.</td>
<td>Yes/No</td>
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<td>2.</td>
<td><strong>Annexure – 1B (SP)</strong>&lt;br&gt;Manpower deployment plan, activity wise foundation works including civil works, erection, stringing (as applicable), testing &amp; commissioning, disposal of materials at site / store etc.</td>
<td>Yes/No</td>
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<td>3.</td>
<td><strong>Annexure – 2 (SP)</strong>&lt;br&gt;List of Lifting Machines i.e. Crane, Hoist, Triffor, Chain Pulley Blocks etc. and Lifting Tools and Tackles i.e. D shackle, Pulleys, come along clamps, wire rope slings etc. and all types of ropes i.e. Wire ropes, Poly propylene Rope etc. used for lifting purposes along with test certificates.</td>
<td>Yes/No</td>
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<td>4.</td>
<td><strong>Annexure – 3 (SP)</strong>&lt;br&gt;List of Personal Protective Equipment (PPE), activity wise including the following along with test certificate of each as applicable:&lt;br&gt;1. Industrial Safety Helmet to all workmen at site. (EN 397 / IS 2925) with chin strap and back stay arrangement.&lt;br&gt;2. Safety shoes without steel toe to all ground level workers and canvas shoes for workers working on tower.&lt;br&gt;3. Rubber Gum Boot to workers working in rainy season / concreting job.&lt;br&gt;4. Twin lanyard Full Body Safety harness with shock absorber and leg strap arrangement for all workers working at height for more than three meters. Safety Harness should be with attachments of light weight such as of aluminium alloy etc. and having a feature of automatic locking arrangement of snap hook and comply with EN 361 / IS 3521 standards.&lt;br&gt;5. Mobile fall arrestors for safety of workers during their ascending / descending from tower / on</td>
<td>Yes/No</td>
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<td>S. N.</td>
<td>Details of Enclosure</td>
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<td>tower. EN 353 -2 (Guided type fall arresters on a flexible anchorage line.) 6. Retractable type fall arrestor (EN360: 2002) for ascending / descending on suspension insulator string etc. 7. Providing of good quality cotton hand gloves / leather hand gloves for workers engaged in handling of tower parts or as per requirement at site. 8. Electrical Resistance hand gloves to workers for handling electrical equipment / Electrical connections. IS : 4770 9. Dust masks to workers handling cement as per requirement. 10. Face shield for welder and Grinders. IS : 1179 / IS : 2553 11. Other PPEs, if any, as per requirement etc.</td>
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<td>5.</td>
<td><strong>Annexure – 4 (SP)</strong></td>
<td>Yes/No</td>
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<td></td>
<td>List of Earthing Equipment / Earthing devices with Earthing lead conforming to IECs for earthing equipment are – (855, 1230, 1235 etc.) gang wise for stringing activity/as per requirement</td>
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<td>6.</td>
<td><strong>Annexure – 5A (SP)</strong></td>
<td>Yes/No</td>
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<td>List of Qualified Safety Officer(s) alongwith their contact details</td>
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<td>7.</td>
<td><strong>Annexure – 5B (SP)</strong></td>
<td>Yes/No</td>
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<td></td>
<td>Details of Explosive Operator (if required), Safety officer / Safety supervisor for every erection / stringing gang, any other person nominated for safety, list of personnel trained in First Aid as well as brief information about safety set up by the Contractor alongwith copy of organisation of the Contractor in regard to safety</td>
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<td>8.</td>
<td><strong>Annexure – 6 (SP)</strong></td>
<td>Yes/No</td>
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<td></td>
<td>Copy of Safety Policy/ Safety Document of the Contractor’s company</td>
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<td>9.</td>
<td><strong>Annexure – 7 (SP)</strong></td>
<td>Yes/No</td>
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<td></td>
<td>‘Emergency Preparedness Plan’ for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing &amp; commissioning, disposal of materials at site / store etc.</td>
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<td>S. N.</td>
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<td>Status of Submission of information/documents</td>
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<td>10.</td>
<td><strong>Annexure – 8 (SP)</strong>&lt;br&gt;Safety Audit Check Lists (Formats to be enclosed)</td>
<td>Yes/No</td>
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<tr>
<td>11.</td>
<td><strong>Annexure – 9 (SP)</strong>&lt;br&gt;Copy of the module of Safety Training Programs on Safety, Health and Environment, safe execution of different activities of works for Contractor’s own employees on regular basis and sub-contractor employees.</td>
<td>Yes/No</td>
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<td>12.</td>
<td><strong>Annexure – 10A (SP)</strong>&lt;br&gt;Information along with documentary evidences in regard to the Contractor’s compliance to various statutory requirements including the following:</td>
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<tr>
<td></td>
<td>(i) Electricity Act 2003</td>
<td>Yes/No</td>
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<td></td>
<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(ii) Factories Act 1948 or latest</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(iii) Building &amp; other construction workers (Regulation of Employment and Conditions of Services Act and Central Act 1996 or latest) and Welfare Cess Act 1996 or latest with Rules.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(iv) Workmen Compensation Act 1923 or latest and Rules.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(v) Public Insurance Liabilities Act 1991 or latest and Rules.</td>
<td>Yes/No</td>
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<td>S. N.</td>
<td>Details of Enclosure</td>
<td>Status of Submission of information/documents</td>
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<td>(vi)</td>
<td>Indian Explosive Act 1948 or latest and Rules.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(vii)</td>
<td>Indian Petroleum Act 1934 or latest and Rules.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(viii)</td>
<td>License under the contract Labour (Regulation &amp; Abolition) Act 1970 or latest and Rules.</td>
<td>Yes/No</td>
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<td></td>
<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(ix)</td>
<td>Indian Electricity Rule 2003 and amendments if any, from time to time.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(x)</td>
<td>The Environment (Protection) Act 1986 or latest and Rules.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(xi)</td>
<td>Child Labour (Prohibition &amp; Regulation) Act 1986 or latest.</td>
<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<tr>
<td>(xii)</td>
<td>National Building Code of India 2005 or latest (NBC 2005).</td>
<td>Yes/No</td>
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<td>S. N.</td>
<td>Details of Enclosure</td>
<td>Status of Submission of information/documents</td>
<td>Remarks</td>
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<td>(xiii)</td>
<td>Indian standards for construction of Low/ Medium/ High/ Extra High Voltage Transmission Line</td>
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<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>(iv)</td>
<td>Any other statutory requirement(s) [please specify]</td>
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<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of compliance]</td>
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<td>13.</td>
<td><strong>Annexure – 10B (SP)</strong></td>
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<td>Details of Insurance Policies alongwith documentary evidences taken by the Contractor for the insurance coverage against accident for all employees as below:</td>
<td></td>
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<tr>
<td>(i)</td>
<td>Under Workmen Compensation Act 1923 or latest and Rules.</td>
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<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of insurance taken]</td>
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<tr>
<td>(ii)</td>
<td>Public Insurance Liabilities Act 1991 or latest</td>
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<td>Yes/No</td>
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<td>[Name of Documentary evidence in support of insurance taken]</td>
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<tr>
<td>(iii)</td>
<td>Any Other Insurance Policies</td>
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<td>Yes/No</td>
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<td></td>
<td>[Name of Documentary evidence in support of insurance taken]</td>
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19. **FORM OF JOINT DEED OF UNDERTAKING BY THE SUB-CONTRACTOR ALONGWITH THE BIDDER/CONTRACTOR**

THIS DEED OF UNDERTAKING executed this .......... day of ................. Two Thousand and .......... by M/s. ........................., a Company incorporated under the laws of ......................... and having its Registered Office at ......................... (hereinafter called the "Sub-contractor" which expression shall include its successors, executors and permitted assigns), and M/s. ........................., a Company incorporated under the laws of ......................... having its Registered Office at ......................... (hereinafter called the "Bidder"/"Contractor" which expression shall include its successors, executors and permitted assigns) in favour of XXXX (Name of the Employer) a Company incorporated under the Companies Act of 1956/2013 (with amendment from time to time) having its registered office at XXXX (Registered Address of the Employer) (hereinafter called the "Employer" which expression shall include its successors, executors and permitted assigns)

WHEREAS the "Employer" invited Bid as per its Specification No.......................for IPDS/PMDP works of ......................... implementation of Advanced Metering Infrastructure.

AND WHEREAS Clause No. .........., Section ..........., of ................., Vol.–I... forming part of the Bid Documents inter-alia stipulates that the Bidder and/or Sub-contractor must fulfill the Qualifying Requirements and be jointly and severally bound and responsible for the quality and timely execution of IPDS/PMDP works in the event the Bid submitted by the Bidder is accepted by the Employer resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Proposal No. ................. dated ............ based on tie-up with the Sub-contractor for execution of aforesaid IPDS/PMDP works.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

1.0 In consideration of the award of Contract by the Employer to the Bidder (hereinafter referred to as the "Contract") we, the Sub-contractor and the Bidder/Contractor do hereby declare that we shall be jointly and severally bound unto the XXXX (Name of the Employer), for execution of IPDS/PMDP works in accordance with the Contract Specifications.

2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Sub-contractor hereby agrees to depute their representatives from time to time to the Employer's Project site as mutually considered necessary by the Employer, Bidder/Contractor and the Sub-contractor to ensure proper quality, manufacture, testing and supply on FOR destination delivery at site basis and successful performance of IPDS/PMDP works in accordance with Contract Specifications. Further, if the Employer suffers any loss or damage on account of non-performance of the material fully meeting the performance guaranteed as per Bid Specification in terms of the contract. We the Sub-contractor and the Contractor jointly and severally undertake to pay such loss or damages to the Employer on its demand without any demur.

3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in New Delhi (Headquarter of Employer) shall have exclusive jurisdiction in all matters arising under the Undertaking.

4.0 We, the Bidder/Contractor and Sub-contractor agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of Contract.

IN WITNESS WHEREOF the Sub-contractor and/or the Bidder/Contractor have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

IPDS & PMRP /SBD/R1
WITNESS (For Sub-contractor)
Signature ........................ (Signature of the authorized representative)
Name .........................
Name .........................
Office Address ............... Common Seal of Company ....................

WITNESS (For Bidder)
Signature ........................ (Signature of the authorized representative)
Name .........................
Name .........................
Office Address ............... Common Seal of Company ....................

Note:
1. For the purpose of executing the Deed of Joint Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant(s).

2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

3. This Deed of Joint Undertaking duly attested by Notary Public of the place(s) of the respective executant(s), shall be submitted alongwith the bid.

4. In case the bid is submitted by a Consortium of two or more firms as partners, then the Joint deed of undertaking shall be modified accordingly.
20. **FORM OF CERTIFICATE OF FINANCIAL PARAMETERS FOR QR**
*(as per clause ref. no. 1.02 and 2.0 of Annexure-A(BDS))*

(Rupees in Crore)

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<td>1.</td>
<td><strong>Net Worth</strong></td>
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<td>a)</td>
<td>Paid up Capital</td>
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<td>b)</td>
<td>Free Reserves and Surplus*</td>
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<td>c)</td>
<td>Misc expenses to the extent not written off</td>
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<td><strong>Net Worth (a+b-c)</strong></td>
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<td>2.</td>
<td><strong>Annual Turnover</strong></td>
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<td>3.</td>
<td><strong>Liquid Asset (Total Current Asset – Inventories)</strong></td>
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* Free Reserve and Surplus should be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/turnover as incorporated in the Profit and Loss Account excluding non recurring income, i.e. sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditors report and Notes to Accounts etc.

Date: [Date]
Place: [Place]

(Chaired Accountants)
Membership No.
Seal
VOLUME-I: SECTION – VII
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1. **Scope of work**

RECPDCL envisages engaging AMI Implementing Agencies (AIA) with sufficient experience, technical competence & expertise, financial strength and related infrastructure facilities for carrying out engineering, design, supply, replacement/installation, commissioning, integration, and 5 years of FMS support including O&M of Advanced metering infrastructure (AMI) solution for 9.25 lakh smart electricity meters for Power Development Department (PDD) of Government of J&K under Prime Minister’s Development Package (PMDP), DDUGJY & IPDS along with all associated accessories on turnkey basis in different areas of Jammu & Kashmir state under service area of JKPDD. The complete scope shall be awarded in 3 different Packages based on region and consumer. The details of the same is mentioned subsequent sections.

The broad scope of work is as follows:

1. Supply, installation, testing, commissioning for Smart Meters(as per Packages) with box and GPRS/RF Mesh compatible network interface card (NICs) as defined in IS16444, with net-metering and Pre & Post-paid functionality along with other necessary accessories like service cable, piercing connectors etc.
2. Supply, Planning, Setup, tuning of RF network elements along with required accessories for formation of RF Mesh Communication Infrastructure including Network Management system (NMS), Head End System (HES) for the project area. AMI Software and associated equipment’s should be capable of handling Package-Wise Meters with 30% expansion without any additional infrastructure and cost implication to JKPDD.
3. Integration with existing MDMS. Mobile app (Bidder can use existing mobile app of utility, subject to meet all the features as described in subsequent sections or can provide separate app) and other utility systems

As the work shall be executed on turnkey basis, all the associated materials shall be procured & maintained by the contractor as per the provision of tender. All the facilities required to execute the work properly shall be engaged by the contractor without any extra cost implication to RECPDCL. The contractor shall also do field survey on the basis of data/list provided by RECPDCL and prepare the BOQ/BOM and get it approved from RECPDCL.

2. **Project Area**

The Project Areas for AMI deployment of approx. 9.25 Lakh Smart Meters are in the various regions of Jammu & Kashmir under JKPDD service area. The complete scope shall be awarded to successful bidders as per Clause 30 of Vol- I, Section –II ITB.

The detailed consumer information with region shall be shared by RECPDCL at the time of execution. The quantity can vary as per Clause 20A of GCC.

In J&K, altitude varies from 300m to 3500m and minimum temperature goes up to -30°C, Equipment supplied shall be suitable for working in such type of environmental conditions and shall have requisite type test certificate specially required for such type of environmental conditions. The offered items shall be designed to operate in varying environments. Adequate measures shall be taken to provide protection against contaminants, pollutants, water & moisture, high altitude, ice loading, lightning & short circuit, vibration and electro-magnetic interference etc.

3. **Basic Functions of Advanced Metering Infrastructures (AMI)**

The main objective of AMI is to establish two-way communications between smart energy meter and Head End System (HES) and enable remote reading, monitoring & control of energy meters and electrical network meters to serve as repository of record for all raw, validated and edited data.

The Advanced Metering Infrastructure helps utility to manage their resource and business process effectively and efficiently.

The basic functionalities of the Smart Metering System defined by CEA are as below.

- Remote Meter data reading at configurable intervals (push/pull)
- Time of day (TOD)/TOU metering
- Pre-paid/Post-paid functionality
- Net Metering/Billing
- Alarm/Event detection, notification and reporting
- Remote Load Limiter and connection/ disconnection at defined/on demand conditions
Remote firmware upgrade
Integration with other existing systems like call centre, GIS mapping, consumer indexing, new connections & disconnection, analysis software, Outage Management System, Report Generation tool, MBC (Metering, Billing & Collection) etc. and Energy Audit application modules established under R-APDRP or Utility's own in-house IT system to derive benefits from Smart metering solution.
Security features to prevent unauthorized access to the AMI including Smart meter & meter data etc. and to ensure authentication of all AMI elements by third party.

In addition to above following functionalities are also required.

Field replaceable Modular Communication Module (shall be bundled in meter housing)
Pairing with Communication Module
Geo Location Identification
Time Synchronisation

3.1 Components of AMI

3.1.1 Smart Meters
Electronic energy meters, capable of two-way communications and two-way measurement i.e. with the ability to measure the incoming and outgoing (Import and Export energy) flow of electricity from a specific location such as a customer's home or business. In addition, energy meter shall have capability to configure in prepaid or post-paid functionality remotely, as and when needed.

3.1.2 Communication Network
It consists of two parts—the Local Area Network (localized to meters in the field) and the Wide Area Network (LAN to central station)—this communication infrastructure enables two-way transmission of data between smart meters and utility. There are several different ways this field-based communications infrastructure can be implemented, depending on the metering system selected.

3.1.3 Head End System (HES) and Network Management System
The main objective of Head End System (HES) is to acquire data from different end points and monitor them automatically from remote. The bidder shall provide the HES suitable to support the collection and storage of 15-minute interval data for all end points in the project area. In future, utility may use the supplied HES for its entire area, therefore expandability feature shall be there to cover such areas through procurement of additional licenses.

The Network Management System (NMS) is responsible for the establishment and management of all radio mesh networks, the discovery of all nodes once deployed in the field, the overall system management as well as security management of those millions of devices.
3.1.4 Meter Data Management System
A software application that stores, validates, edits and analyses meter reading data prior to releasing it for integration into other operational systems of utility such as customer billing, load forecasting and outage management.

Interfaces and Integration: This systems integration activity involves modifying existing applications to handle the enhanced automated meter reading information and building interfaces between new and existing enterprise applications to support utility’s end-to-end business processes.

3.1.5 Mobile Application
This application also serves purpose of In-Home Display (IHD) and web application used by consumer for monitoring usage. The AMI system should support with strong user management, administrative area management (utility administrative hierarchy like zone, circle, division, sub division etc.) and flexible tabular, graphical reporting module.

3.2 AMI Solution Design Recommendations
The proposed solution should comply following basic design principles

3.2.1 Open and Industry Standards for Interoperability
The proposed solution must have highest degree of interoperability and the solution components shall be standard based and adopt an open approach rather than support a specific technology.

3.2.2 Service Oriented Architecture (SOA)
AMI solution components must follow SOA principles to provide specific services using well defined interfaces. The AMI solution design shall be based on cross-functional components or subsystems and shall be implemented in such a way that there is an opportunity for reuse. The integration architecture shall be based on the concept of a service, so all the applications of the AMI solution are able to integrate without any complexity.

AMI system is envisaged as a Service driven architecture at the core of it. AMI system features can be accessed via any user interface (internal or 3rd party applications) which shall work on top of these Services. Adoption of open standards are of paramount importance for the robust and scalable AMI system. Data access must be always through Services, no application will access AMI data directly from the storage layer or data access layer. For every internal data access also (access between various modules) there will be services and no direct access will be there to ensure the AMI system is scalable and secure.

3.2.3 Solution Integration
- The integration middleware should be based on Service Oriented Architecture (SOA) and other forms of Application Program Interfaces (API) and use publish / subscribe mechanism
- The integration middleware to be an open architecture based
- Implementation and configuration of functional APIs from meter manufacturers and configuration of Head End System/Meter Data Acquisition System.
- All meter data of 30/15 minutes block (Load profile) shall be polled as defined in subsequent sections. The duration to polling frequency shall be remotely configurable and can be altered as per the requirement of utility.
- The bidder must store and manage the security information related to Smart Meters. This include Device Security keys and asset information for processing further business flows.
- The bidder must support the mass receipt of data of each meters every day and subsequent update of MDMS with the necessary asset information to complete meter reading and billing.
- The integration middleware/interface must validate the Data to be integrated with other applications and system
- It must maintain integration logs that confirm the success or otherwise of the interface, complete with control totals.
- The integration mechanism adopted must have minimal impact on the existing systems. The access to data will only be through applicable business rules i.e. the applications will not access data directly without going through APIs managed by business rules/validation/workflow.

3.2.4 Data Migration–Meter Installation Entry
AMI rollout in the project area is a mass meter replacement activity, it requires data to be migrated from its legacy systems as per requirement of the utility. The AMI implementation agency shall update the DISCOM’s consumer database and MBC database with the accurate and captured new/updated consumer information during integration.
3.2.5 Modular Design
The application user interface, logic, data must be separate. The logical design of components, sub-systems, application systems and databases will be ideally partitioned. These partitions shall have well-defined interfaces established. Logical boundaries are needed to separate components from each other. Modular design is more adaptive to changes in internal logic, platforms, and structures. It is easier to support, is more scalable and supports interoperability.

3.2.6 High Availability, Failover and Load Balancing
Proposed Architecture shall have adequate redundancies so as to have no single point of failure for the solution. The solution tier for critical applications should consist minimum of two nodes clustered on a fail-over configuration for the critical components like Web, application and database servers at the Data centre site. On failure of the primary application server, the 'failover' server shall take over processing, similarly on failure of a database server, the other server shall continue seamlessly, thus providing the desired availability.

AMI applications shall have the capability to failover to a redundant or secondary unit upon failure of the primary unit. Likewise, the load on the primary unit shall be shared with a secondary unit upon the primary unit reaching its capacity.

3.2.7 Business Continuity and Disaster Recovery
In case if primary site / DC fails, the business shall continue from DR site. Connectivity between primary site and DR site shall be redundant. In case of Failures of Storage at DC, DR Backups shall be used to restore the Database from the last backup taken. This shall be defined in Backup policy during project execution.

Bidders are expected to keep the above issues in mind and propose technically best alternative to ensure that the system is available for the users in all times by conceptualizing various scenarios and explaining how their solution addresses all the possible scenarios.

3.2.8 Security Zones Deployment
The IT Infrastructure will have multiple security layers to secure the infrastructure from threats. The proposed deployment has different security zones as briefed below and all zones shall have separate firewall in addition to the external (Perimeter security appliances). The firewall policies shall be configured based on zone-based requirements.

- Zone for Production Servers (Database and Application servers) Zone: This zone shall not be accessible from Internet directly. All user traffic will to enter in this security zone after firewall only. The proposed solution will have provision of dedicated Internal Firewall to secure the critical production (Data base and Application) environment.
- Web server/Application: This security zone will host all servers that can be accessed from external users after authentication and traffic filtering. This zone shall host the Web servers, Access control and sign on servers, Antivirus Server etc.
- Testing and Development Zone: This zone will host all servers required for test and development for applications. This zone will have limited access and it will not have any direct access to Production Servers Zone and the activity shall be monitored.

Utility intends to implement Smart Meter/AMI system on mixed/hybrid communication technology, i.e. communication technology need to be decided based on field condition, and most suitable communication technology in that area shall be selected for meter data acquisition. However, considering the project geographical & demographic area the AMI solution shall base on RF Mesh Canopy Network on Unlicensed Sub-GHz frequency in India i.e. 865-867 MHz based on IPv6 based 6LoWPAN and other relevant open standards as defined in IS 16444 in most of the project area. **Further, GPRS based endpoints shall be limited to 30% of total quantity in each package.**

A hybrid( RF+ GPRS) AMI Communication Network
4. Smart Meter

The scope of the bidder(s) shall include designing, engineering, manufacturing, testing, inspection, packing, supply, transportation & insurance (till delivery at site), delivery to project site (locations shall be intimated later), unloading, handling and storage of single-phase and three-phase whole current smart meters, along with meter box. The smart meters shall have the replacement warranty along with operational support for the project duration till completion of FMS period. The functionality and specification of these smart meters (unless otherwise mentioned in this document) need to be in accordance with the following standards and/or regulations with latest amendments:

- IS 16444 (Part 1): a.c. Static Direct Connected Watthour Smart Meter Class 1 and 2 – Specification (For detailed specification refer Volume III of the RFP)
- CEA Regulations on “Installation and Operation of Meters”, 2006 to be read in conjunction with amendments dated 04 June 2010 and 26 November 2014
- Smart meter specifications as mentioned in CEA Guidelines on “Functional Requirements of Advanced Metering Infrastructure (AMI) in India” issued in August 2016. The bidder(s) shall adhere to the clauses related to smart meter functionality and specification as per IS 16444 Part 1 with all latest amendments.
- Supply of In-Home Display (IHD) is not included in this tender.
- Testing as per 35 KV high voltage discharge up 35 KV: The Meter shall be immune under external magnetic influences as per CBIP 325. Meter shall be tested for high voltage discharge (Spark) up to 35 KV as per CBIP 325. This test shall be mandatory.
- Smart meters shall ship with post-paid and bidirectional mode configuration, later as and when needed department can convert them to prepaid/export mode. Smart meters and HES/MDM has functionality to convert them in desired mode remotely.

5. Communication Infrastructure for AMI

The communication infrastructure should be based on RF mesh network and cellular network or a combination of these. The communication network shall be based on suitable standards from ITU/IEC/IEEE/CEN/ CENELEC/ETSI for NAN and WAN network. Communication network shall provide reliable medium for two-way communication between various nodes (smart meter) & HES. RF based network should use license free frequency band available in India. The engagement of network service provider would be in the scope of AMI Implementing Agency to meet the performance level as given in the document.

5.1 General Requirement

The AMI Implementing Agency (AIA) shall design a reliable, interference free & robust communication network keeping in view the site conditions. It shall be flexible in terms of providing communication in variable terrain & urban density. The AIA shall design the network architecture keeping in view the existing and planned infrastructure of the utility. During designing, suitable consideration shall be kept for future expansion as per requirement of Utility. Before designing the communication network, the AMI Implementing Agency (AIA) shall do the site survey and would provide the most efficient communication infrastructure. The entire infrastructure & associated civil works required for installment & commissioning of equipment/devices like DCUs, repeaters, routers & access points etc. shall be in the scope of AMI Implementing Agency (AIA). The operational testing of all the network elements has to be demonstrated by the bidder to the satisfaction of the utility.
The network solution offered by the bidder should have disaster recovery mechanism in place. The bidder must provide network redundancy for each element other than nodes, while designing the system for self-healing features.

Bidder to clearly specify performance parameters to capture this commitment consistently. Communication NIC cards/ SIM Cards (as per live database of system as on that date) in the network should be accessible from HES at any point of time. Bidder should design the system accordingly.

The bidder shall confirm that, the bandwidth made available by the Ministry of communications for this purpose, shall not in any way limit or hamper the performance of AMI. Bidder to submit Equipment type approval from WPC & any other clearance as per applicable regulations by GOI and/or State Government; to ensure that equipment operate in designated frequency band and power levels.

The quality of installation of the various equipment & power supply wiring to all field equipment shall be as per standards/ regulations/prevailing practices of the utility. The supply of electricity needed for operation and maintenance of entire AMI system shall be the provided by the utility free of cost. A suitable network management system (NMS) shall be provided to monitor the performance of the communication network round the clock. The NMS shall provide viewing of all the networking elements deployed at site and enable configuration & parameterization of the networking devices and the nodes.

In future, it would be bidders’ responsibility to extend the support to integrate new meters or any other application/equipment as decided by JKPDD in the project area without any additional cost burden on JKPDD during the contract period.

In case communication network under scope of this RFP is developed exclusively for JKPDD, Bidder to commit that the communication media is transparent and shall be exclusively used for data transfer of JKPDD and that capacity can be allocated such that it will not be used for any other purpose without any written consent from JKPDD. Bidder shall submit corporate principal certificate for adherence of this clause.

The bidder shall ensure the up-gradation of the Firmware / software in the communication modules/devices from remote from time to time to meet the increasing demand of the system in operation / overcoming system limitations / bugs. The bidder shall also ensure incorporation of new hardware (communication devices, meter, NIC etc.), if required, in future. The bidder therefore shall ensure that all such upgrades shall seamlessly fit into the existing end to end system in operation and shall be backwardly compatible to the earlier generation devices / software / Firmware in operation to guard against obsolescence to JKPDD during the contract period.

The bidder shall spell out the time duration required and associated success rate in case of OTA firm-ware up-gradation on number of meters/communication devices simultaneously, well in advance, from the design stage and shall also ensure that all these Access points & Nodes to be used in the system shall have more than adequate memory capacity for the Firmware upgrades to happen smoothly, and securely, meeting the possible changing enhanced expectations for next 5 years after complete Go-Live, as well as, avoiding overwriting operations during the Firmware upgrades, thus avoiding obsolescence of the hardware installed at site in quick time.

5.2 Network Security
The Network shall have adequate cyber security measures not limited to the measures as described below. The network security would be extended to all the interfaces also.

**Secure Access Controls:** The system shall include mechanisms for defining and controlling user access to the operating system environment and applications. Best practices from enterprise security including password strength, password aging, password history, reuse prevention etc. must be followed for access control.

**Authorization Controls:** A least-privilege concept such that users are only allowed to use or access functions for which they have been given authorization shall be available.

**Logging:** Logs must be maintained for all attempts to log on (both successful and unsuccessful), any privilege change requests (both successful and unsuccessful), user actions affecting security (such as password changes), attempts to perform actions not authorized by the authorization controls, all configuration changes etc. Additionally, the access to such logs must be controlled in accordance to the least-privilege concept mentioned above, so that entries may not be deleted, accidentally or maliciously.
Hardening: All unnecessary packages must be removed and/or disabled from the system. Additionally, all unused operating system services and unused networking ports must be disabled or blocked. Only secure maintenance access shall be permitted and all known insecure protocols shall be disabled.

Malicious Software Prevention: Implementation of anti-virus software and other malicious software prevention tools shall be supported for all applications, servers, data bases etc.

Network Security: The network architecture of the HES must be secure with support for firewalls and encryption. The system shall also allow host-based firewalls to be configured, as an additional layer of security if the network firewall were to fail.

5.3 RF Network interface Card (NIC) for Smart meters
RF NIC card is the enabler for data exchange between smart meter and back-end systems. It shall be designed for M2M communication, smart metering and Smart Grid communication, industrial automation and IoT.

5.3.1 Hardware Specifications
- Network interface card shall be based on RF mesh 6LoWPAN technology which shall be in compliant with IPv6 as defined in IS 16444.
- It shall be suitable for M2M communication, smart metering and smart grid communication, industrial automation and IoT.
- Support open platform with compact design and it shall be fixed within the smart meter slot and operate in the same environment as of meter.
- Network interface card shall have necessary hardware support to deliver first breath and last gasp as defined in IS16444 and IS15959 part 2 & 3.
- It shall have design life of 10 years.

5.3.2 Electrical Specifications
- NIC card shall be capable of operating on 5V DC drawn from the smart meter as defined in BIS standard of Smart meter IS16444.
- Average power consumption 100mA@5V (0.5W) and Peak Power consumption 700mA@5V (3.5W).
- NIC shall not exceed maximum power requirement of 7W in any case and it shall be in line with the smart meter standard as per IS16444.
- There shall be proper protection and isolation between smart meter and NIC Card.
- Circuit should have following protections:
  - Short Circuit Protection
  - Over Current Protection
  - Over Voltage Protection

5.3.3 Software Specifications
- Network Interface Card (NIC) shall be interoperable at smart meter level of multiple make and model.
- NIC card shall support remote Device Management Capability such as Reset, Configuration, Log Check, Ping, and over the air Firmware upgrade.
- RF NIC card shall support communication protocols as mentioned below in Standard Communication protocols.
- NIC shall support two-way communications between smart meter & head-end system such as data exchange, configuration parameters exchange, alarms, operational commands, firmware upgrade of the meter as defined in IS16444 and IS15959.
- It shall support push services, alarms services of the smart meter as defined in IS16444 and IS15959.
- It shall also support on-demand / schedule reading, connect/disconnect, time sync, configuration and over the air firmware upgrade from the head-end system.
- It shall support any schedule of data exchange such as real time, every 15/30 minutes, Hourly, Daily and Monthly.
- RF NIC card shall have persistent RF network connectivity throughout and shall be able connect to RF network automatically. It shall support self-configuring and self-healing concepts.
- RF NIC card shall operate 24*7 and shall recover from any deadlock situation immediately in the field.
- Support for possibility to provision a unique certificate/key in each card for mutual authentication with the NMS for security point of view. It shall support standard security protocols. It shall be compliant with cyber security norms.
- It shall register with network i.e. Login and logout of each terminal to the NMS Server. It shall be recognized in the NMS as authorized node.
- Following attributes should be pushed periodically for effective management of the RF network such as Firmware version, Hardware version, Link strength values, Next Hop information, packet error rate etc.
- Data must be encrypted with AES 128.
5.3.4 Standard Communication protocols

<table>
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<td>COAP</td>
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<tr>
<td>DTLS</td>
<td>DTLS for security</td>
</tr>
<tr>
<td>RPL</td>
<td>RPL for mesh routing</td>
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</tbody>
</table>

5.3.5 RF Bands Specifications
- RF Band: 865-867 MHz (subject to WPC/DOT compliance).
- Max output power as per WPC recommendations (Wireless Planning & Coordination of India)

5.3.6 Constructional and Mechanical Specifications
- Antenna interface and LED visualization without removing the card from the smart meter slot.
- It shall work with PCB antenna which shall be placed inside the box. Antenna placement shall not interfere with smart meter functionality in any manner.
- It shall have provision to take the antenna out from the Smart meter wherever required during field installation. Antenna interface shall be SMA type female.
- LED/ LCD indication for System, Power ON indicator.
- LED/ LCD indication for latching on to the network, latched on to the network, network not in the range.
- LED indication for network signal strength (RSSI)
- LED/ LCD indication for Traffic indicator.

5.3.7 Operational Specifications
- In-line with IS 16444 standard and shall be operational in J&K environmental conditions

5.4 DCU/Access point/ Gateway/ Router
The bidder shall propose an RF mesh communication canopy in order to create coverage to connect current and future devices. In this type of communication network, different nodes (smart meters) shall interconnect with each other using RF mesh network and they shall communicate with nearby routers to transfer the data to gateway/router/access points/DCU. In such communication network, if any routers/repeaters/access points/gateway/DCU fail, then nodes connected on that device shall automatically reconfigure the mesh with available nearby nodes.

The scope includes: Design, Supply, Installation, Testing, and Commissioning of a communication canopy network for seamless data transfer from smart meters. Communication canopy routers/repeaters/access points/gateway/DCU shall have RF Mesh Communication for NAN and 4G (with fall back on 3G/2G) &Ethernet port (MPLS/ Optic Fibre) for WAN connectivity.

5.4.1 General requirement of routers/repeaters/access points/gateway/DCU based RF mesh network:
The general requirements for the RF mesh network are specified below:
- The communication network shall have dynamic & self-healing capability. If one of the communication element like router or access point fails then nodes connecting to that element shall switch to best available element for communication of data to HES.
- It shall support both IPv4 & IPv6 network addressing to connect with HES and vice versa.
- Each node shall keep a track of best available nearby nodes.
- The communication network equipment shall use licence free frequency spectrum as defined by Government of India.
- All the communication network equipment shall be certified by WPC, Government of India for operation in licence free frequency band.
Suitable network management system (NMS) shall be available to monitor the performance of the communication network round the clock. The NMS shall provide viewing of all the networking elements deployed at site and enable configuration, parameterization of the networking devices and the nodes.

- It shall support remote firmware upgrading
- It shall be secure enough to avoid all cyber threats like DDoS, spoofing, malwares etc.
- The communication network shall ensure secure communication of data to HES.
- The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP-55). A suitable mounting provision shall be made for the equipment.
- Enclosure: Provision for security sealing shall be provided and in case the gasket of the cover is used for protection against moisture, dust and insects, the gasket shall be made of weather and aging resistant material.
- The list of standards followed in all the devices/equipment used in communication network shall be furnished.
- Routers/repeaters/access points/gateway/DCU shall have suitable power supply arrangements. Provision of battery backup for at least 1 hour shall be there to continue operation in case of power supply failure. The life expectancy of battery shall be 5 years or more.

5.4.2 Configuration, Functionality & Interface

Routers/repeaters/access points/gateway/DCU shall have following configuration functionalities:

- It shall be able to configure the communication with underlying nodes/end points.
- It shall support on demand read and ping of individual/group of meters.
- It shall push events like tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters.
- It shall have Wide Area Network (WAN) connectivity to the HES through suitable means.
- It shall communicate with routers/nodes/end points on RF mesh (license free band).
- It shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads.
- After power Interruption, on restoration of power supply, it shall establish communication with underlying devices as well as upstream application (HES) automatically.
- Routers/repeaters/access points/gateway/DCU shall facilitate recording of
  - No of packet failures
  - Retry attempts
  - Missed periodic reading
  - Failure to connect
  - Tamper events
- It shall be capable to handle interval data of suitable nos. of any type of smart meter (1ph/3ph).
- Routers/repeaters/access points/gateway/DCU shall be able to acquire and send data to HES for full capacity (No. of meters/field devices it is designed for) within a suitable time period to achieve the performance level.
- Routers/repeaters/access points/gateway/DCU shall support remote firmware upgrades as well as remote configuration from the control centre.

5.4.3 Testing of the DCU / Access Point

Routers/repeaters/access points/gateway/DCU shall be tested for the following:

- Radio interference measurement (CIS PR 22)
- Surge test (IEC 610004-5)
- Fast transient burst test (IEC 61000-4-4)
- Test of immunity to electrostatic discharges (IEC 61000-4-2)
- Test of immunity to electromagnetic HF field (IEC 61000-4-3)
- Resistance to heat and fire

The bidder shall provide IP-55 compliance test certificate for DUC/Router / Gateway / Access Point

5.4.4 Other requirements for RF Mesh Communication on 865-867 Mhz

The bidder shall provide a standard based solution, built for the future, based on the following yardsticks:

- Scalability and Availability
- Good Operability
It shall be possible to operate the system as a modern ICT system.
Life Cycle Cost shall be low - Bidder shall provide support and maintain the entire canopy (including hardware, software and other systems) for a period of 5 years.

- **High degree of information security and interoperability**
  - The system security mechanisms and communication protocols shall be based on open standards and protocols.

- **Minimal risk**
  - The system shall be based on technology independent of a specific contractor.
  - The system components shall be of a good quality and modern design.
  - The system shall be designed with a focus on security and data integrity.

The proposed solution shall be based on generic IPv6 from end-to-end. The communication solution must be scalable in volume and the equipment must have built-in reserve capacity to allow memory and processes to be upgraded with new functionality over time.

### 5.4.5 Gateway / Router Specifications

Gateway shall be the enabler for smart meters to transfer data to the back-end applications on IPv6/IPv4 networks and manage RF mesh network.

#### 5.4.5.1 Hardware Specifications

(i) Gateway shall support one 10/100M Ethernet port through RJ45 connector for fibre backhaul connectivity.
(ii) Gateway shall have RF cards to maintain a mesh network. The gateway shall include any circuitry necessary for multiple independent RF cards. There shall be adequate provision to avoid RF interference between RF cards.
(iii) Gateway shall be capable of running IPv6 based 6LowPAN stack for managing the RF network.
(iv) In addition to Ethernet, the Gateway shall ensure the appropriate backhaul for secure transfer of data to HES. In case of GPRS/3G/4G backhaul, it shall support SIM card from any service provider. It shall have Wide Area Network (WAN) connectivity to the HES through suitable means.
(v) Gateway shall have enough processing power and memory to support multiple applications.
(vi) Gateway shall have an RTC which shall retain the date and time information. RTC shall have a battery backup for the RTC power.

#### 5.4.5.2 Electrical Specifications

(i) Input Voltage – DCU / Gateway / Routers / Access Points shall have suitable power supply arrangements. Provision of battery backup for at least 1 hour shall be there to continue operation in case of power supply failure. The life expectancy of battery shall be 5 years or more.
(ii) Phase reversal condition, if phase and neutral interchange shall not affect the gateway functionality in any manner.
(iii) The Gateway shall withstand surge voltage up to 10KV.
(iv) The Power chord shall be of 10mtrs length and 1.2KV insulation
(v) SMPS should have following protections:
  a. Short Circuit Protection
  b. Over Current Protection
  c. Over Voltage Protection

#### 5.4.5.3 Software Specifications

(i) Gateway shall support Device Management Capability
(ii) Fibre backhaul shall have priority in case both (fibre and cellular) are available.
(iii) Gateway shall support multiple TCP/UDP sockets
(iv) Gateway shall support configuration locally and remotely
(v) Gateway shall be able to relay traffic from a radio mesh network to the WAN and from the WAN to a radio mesh network transparently.
(vi) Gateway shall have redundant IP address of back-end server. Gateway shall be able to connect to secondary IP if primary IP is not reachable.

#### 5.4.5.4 Constructional Specifications

(i) Gateway shall be enclosed in Aluminium / Plastic Casing with power supply enclosed inside. The plastic should be engineering polymer PC/PBT with UL-VO rating.
(ii) Gateway cover and body should have arrangements for sealing.
(iii) Gateway shall have safety against fire. It shall not be ignited by thermal overload or by live parts in contact.
(iv) Water and dust proofing for the gateway shall be provided and shall be minimum IP55 compliant.
(v) LED indication for Power ON indicator. Other suitable LED indications shall also be available.
### 5.4.5.5 Communication Specification

<table>
<thead>
<tr>
<th>RF Standard</th>
<th>IEEE 802.15.4g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>Max output power: As per WPC recommendations (Wireless Planning &amp; Coordination of India)</td>
</tr>
<tr>
<td>IPv6 - 6LoWPAN</td>
<td>IPv6 support for all IP traffic between the Server and each Gateway (Backward compatible with IPv4 infrastructure as well) 6LoWPAN support for all IP traffic over radio Mesh networks Open standard: RF944 and associated</td>
</tr>
<tr>
<td>COAP</td>
<td>Support for COAP as application layer protocol Open standard: RFC 7252</td>
</tr>
<tr>
<td>TLS</td>
<td>DTLS for security Open standard: RFC 4347 and associated</td>
</tr>
<tr>
<td>RPL</td>
<td>RPL for mesh routing Open standard: RFC 6550 and associated</td>
</tr>
</tbody>
</table>

### 5.4.5.6 Device Management Features

| Registration | Login and logout of each terminal to the Server |
| Monitoring | The following attributes should be pushed periodically from the Gateway  
- Firmware version  
- Hardware version  
- Link strength  
- Next Hop information  
- IP packet count  
- Radio packet and error count |
| Events | Events should be pushed to the Server:  
- Low link strength value  
- Connectivity related like server reachability fail et cetera  
- Low 4G/3G signal |
| Reboot | Remote and Manual reboot option shall be supported in the Gateway |
| IPv6 Ping | IPv6 ICMP request/ response from the Server to any Terminal |
| IPv6 Trace route | IPv6 Trace-route from the Server to any Terminal |

### 5.4.5.7 System Management Features

| Firmware Update | Gateway shall support unicast firmware update, which means firmware shall be upgraded to one terminal from the server.  
Gateway shall support multicast firmware update which means firmware shall be upgraded to group of terminals from the server |
| Time Sync | Support for time synchronization with respect to NTP Server. |
| Time Distribution | Gateway shall support time distribution to each Terminal |

### 5.4.5.8 Security Management Features

| Key Infrastructure | Support for Possibility to provision a unique certificate/key in each Terminal for mutual authentication with the Server |
| Data Security | Data must be encrypted with AES. |

### 5.4.5.9 Provisioning Management Features

| Provisioning | Parameters shall be defined during Terminal provisioning (pre-installation)  
- Terminal IDs  
- Terminal type: Mesh Node /Gateway  
- MAC address of the 6LoWPAN interface  
- Keys  
- For Gateway Terminals  
  - Primary and Secondary IP Addresses of the Back-end Servers |
<table>
<thead>
<tr>
<th>Configuration</th>
<th>Application profiles of the configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Location profile</td>
</tr>
<tr>
<td></td>
<td>• RPL profile</td>
</tr>
<tr>
<td></td>
<td>• 6LoWPAN profile</td>
</tr>
<tr>
<td></td>
<td>• Destination IP Address profile</td>
</tr>
<tr>
<td></td>
<td>• COAP profile</td>
</tr>
<tr>
<td></td>
<td>• Ethernet Backhaul Profile</td>
</tr>
<tr>
<td></td>
<td>• Cellular modem profile</td>
</tr>
</tbody>
</table>

**5.4.5.10 RF Bands Specifications**

(i) RF Band: 865-867 MHz for sub-GHz cards (subject to WPC/DOT compliance)

(ii) NAN Frequencies (subject to WPC compliance)

   a. 4G: 800/1800/2300 MHz
   b. UMTS: 850/800, 900, 1900 and 2100 MHz
   c. GSM/GPRS/EDGE: 900/1800 MHz

(iii) Shall have provision to use an external antenna during deployment

**5.4.5.11 Operational Specifications**

(i) Operating Temperature: -30 C ~ +60C

(ii) Storage Temperature: -30 C ~ +70C

(iii) Humidity: up to 95% RH (Non-Condensing)

(iv) Accessories

   a. For Gateways, wired antenna with cable length as specified with Roof mounting for both RF and cellular antennas.

(v) Certification

   a. Environmental Parameters
   b. IP55 Certification

Further, bidder should consider the operating environment for DCU/Gateway/Access point according to the deployment site at J&K region.

**6. IT Infrastructure for AMI**

**6.1 Existing IT Infrastructure of JKPDD**

All JKPDD offices (Circle/Division/Sub-Division) are connected to the Data Centre at Bemina, Srinagar. DRC is established at Jammu which has a dedicated MPLS connection with DC at Srinagar.

Network connectivity information is as below:

JKPDD is having two software applications for Consumer Metering, Billing and Collection management. The one is Oracle Utility Software application implemented by M/s Wipro under RAPDRP scheme for 30 Towns and the other one is NIC developed (Front End – Visual Basic and Data Base is SQL) Application. Both the system having a 13-digit unique customer account code across both the application. JKPDD is also facilitating WEB page and mobile application for Consumers for tracking consumption and payment processing.

JKPDD Server architecture is per below figure:
The R-APDRP System envisaged Modules implemented in place, details are as under given in table:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Scope of Application Packages under RAPDRP</th>
<th>Product OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Meter Data Acquisition</td>
<td>Amitech</td>
</tr>
<tr>
<td>2</td>
<td>Energy Audit</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>3</td>
<td>New Connection</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>4</td>
<td>Disconnection &amp; Dismantling</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>5</td>
<td>GIS based Customer Indexing and Mapping</td>
<td>ESRI</td>
</tr>
<tr>
<td>6</td>
<td>GIS based integrated network analysis</td>
<td>ABB Limited</td>
</tr>
<tr>
<td>7</td>
<td>Centralized Customer Care Services</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>8</td>
<td>Management Information System</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>9</td>
<td>Web Self Service</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>10</td>
<td>Identity and Access Management</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>11</td>
<td>Metering</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>12</td>
<td>Billing</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>13</td>
<td>Collections</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>14</td>
<td>Asset Management</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>15</td>
<td>Maintenance Management</td>
<td>Oracle India Private Limited</td>
</tr>
<tr>
<td>16</td>
<td>Mail &amp; Messaging</td>
<td>Microsoft Corporation (India) Private Limited</td>
</tr>
</tbody>
</table>
Presently, Oracle Customer Care & Billing (CCB) 2.3 installed at JKPDD on which their entire metering, billing and collection process is running for R-APDRP towns. Oracle CCB is running on Solaris 10 Unix OS on application servers and supported by Oracle Database Management System (DBMS) Client 11.2.0. Utility is changing its existing MDM with AMI compatible MDM and shall have all the features of AMI as defined in CEA guidelines. The details of new MDM (make and versions) shall be provided to bidder at the time of detailed design and engineering phase to which the integration of HES need to accomplish.

**6.2 General Requirement**

Bidder need to study the existing IT system of JKPDD to ensure seamless integration of proposed system under the scope of this RFP. Bidder is required to bring out any additional requirement with proper breakup for solution deployment and quote the prices for the same, otherwise anything required during implementation stage shall be supplied by the bidder free of cost as in order to comply with functional requirements as mentioned in RFP for successful commissioning of the project.

Bidder is required to provide set up in active passive DC-DR setup (where DC & DR will have same capacity). The designed solution must have provision of automatic switchover in case of failure with RTO <= 6 hour & RPO <= 30 minutes.

**Information Security: Log Monitoring and Correlation**

All Servers / sub systems / network devices / appliances as proposed by AMI Implementing Partner shall have capability and throw logs to the log server. The Logs and events generated by network and hardware component / devices of the system shall be monitored. AMI Implementing Partner must provide a Security information and event management (SIEM) solution for the same which shall be capable to provide various security alerts, events, logs generated from various IT infrastructure (Hardware/Software) components. AMI Implementing Partner would need to ensure the IT security compliance and therefore monitor the threats/logs generated by various equipment's /sub systems.

**Backup and Recovery**

Data is an asset, just as personnel, physical resources, and financial resources are assets. Data and information are resources that are extremely valuable for the organization; hence data management processes must be in place to maintain the data. AMI Implementation Agency Partner needs to prepare a backup policy which shall be approved by RECPDCL/JKPDD. AMI Implementation Agency would be required to design detailed backup and recovery policies which shall be implemented at the time of deployment and the responsibility of taking backups and testing the backups as per the backup policy shall be of AMI Implementation Agency for the entire project period. AMI Implementation Agency shall ensure that the data is replicated at the backup and DR Site. AMI Implementation Agency shall be responsible for safe and secure storage of complete data. Bidder shall responsible for any loss of data and shall recover it without any extra cost to JKPDD/ RECPDCL.

**Policy and Documentation**

Bidders will have to develop, document and implement the following:

- Data Backup, Archival and Retention Policy
- Security Policy
- Business Continuity and Disaster Recovery Policy

All the policy and procedure which will ensure availability and security at all times, these policies have to be updated every year or as per requirements of RECPDCL/JKPDD. AMI Implementation Agency MUST design and implement the policy (with RECPDCL/ JKPDD inputs) in compliance to the ISO standards (such as Information security ISO 27001). Design of Information Security Policy shall necessarily include but not limited to the following policies to ensure IT security:

- IT Risk Management Policy
- Information Classification Policy
- Access Control Policy
- User ID and Password Management Policy
- Internet Access Policy
- Asset Management Policy
- Incident Management Policy
Scalability

Scalability is the most important aspect of the project. It is envisaged that the users and geographic locations may increase over the next few years. The system architecture and the network design shall have the ability to handle the growth with respect to functions, users, load and geographic sites. Also, applications must evolve to support new business requirements and make use of new technologies. Bidder must factor both vertical and horizontal scalability in the design and deployment of JKPDD AMI application.

Technical Obsolescence

The systems including communication technologies, which are at a risk of technical obsolescence over the next few years and over the operating life of the system shall be identified and reported. This may also include end-of-sale and end-of-support policies governing the proposed technologies. The compatibility between the various elements of the system need to be considered and mitigation options, not be limited to periodic update from OEM/system supplier/AMI Implementation Agency, shall be indicated in detail. The offered IT HW and other system shall not be under obsolescence till the completion of the projects.

6.3 Head End System

- Head-end System (HES) shall be deployed to manage data from a multitude of field devices and applications.
- Suitable Network Management System (NMS) shall be deployed to manage communication canopy network and its associated devices and to monitor the performance of network. This module shall provide real time information about the canopy network and its associated devices.
- System shall be capable to support different configurable QoS (Quality of Services) for different use cases. For example, operational activity such as connect/disconnect shall have higher priority than routine data transfer.
- Data from canopy network shall report to main data centre but in circumstances where it is not possible then data shall report to Data Recovery Centre (DR).
- Node shall have auto-discovery and auto-registration features so that RF nodes along with its connecting devices shall register themselves in head-end application upon its deployment and establishment of communication.
- System shall provide daily, weekly and monthly performance reports, tracking equipment failures, communications failures and security breach.
- System shall facilitate OTA (Over the Air) firmware upgrade of network terminals and application devices
- Security shall be part of all the elements of solution. Bidder shall provide detailed description about the proposed security model.
- System shall not be impacted by obsolescence
- Bidder shall work with meter vendors for integration of RF node in smart meters. Bidder shall provide the methodology and approach for integration. Integration shall include both hardware and protocol.
- Bidder shall provide technical specifications of canopy elements including hardware and software.
- Head-end System (HES) shall provide interface with field devices through canopy network. HES shall provide web-based user interface for access. It shall perform network management, device management, device data management and processing of the data before exchanging to other systems.

6.4 Meter data management system (MDM)

It is the heart of AMI. MDMS shall be a single repository of all meter data. The scope of AMI SI shall be to integrate the HES with MDMS, IT infra and other utility systems and mobile app that will be use as IHD by consumers for checking energy uses, balance enquiry, pre-paid meter recharge, post-paid bill payment, complaint booking, status check and other day- by- day consumer related operations.

6.5 Prepaid functionality

JKPDD shall convert the installed post-paid smart meters to pre-paid as and when required. This shall be done OTA through HES. The prepaid calculation shall be on server side. Meter will display the balance and emergency credit limit on display in both auto and push mode, during pre-paid configuration in addition to existing parameters. Bidder need to provide the detailed prepaid functionality and get it approved from RECPDCL, before implementing on server side.

The prepaid application can be in HES or MDM or standalone in nature. It is bidder’s responsibility that all the systems shall be integrated seamlessly in such a way that information flow from one system to another will be on
real time basis. The balance calculation on server side shall be done at least once in a day and pass on the same to the meter. Load switch shall not be disconnected during happy hours, Saturday, Sundays and holidays. The list of such days will be provided during detailed design and engineering phase. Low balance alerts shall be pushed as notification on mobile app and via SMS on consumer mobile. Consumer can avail emergency credit in days/amount/units after exhausting of the balance. Consumer shall activate the emergency credit through mobile app or web portal or by combination of switches (push-button) on meter. Meter will disconnect the load only through command send via HES when the balance will be negative and emergency credit is also exhausted. The emergency credit shall be adjusted with next recharge amount.

The tariff structure for pre-paid metering shall be in-line with JKSERC tariff order. Bidder can use the tariff table of CCB as it is after seamless integration, or may implement separate tariff table in prepaid application. The tariff implementation shall be same or replica, as defined in CCB so that energy consumption and billing shall not have any difference at the end of month. Any changes in tariff can be done on test server first and JKPDD will approved the same before implementation on production server.

In case of communication failure, it is bidder’s responsibility to reconnect the load switch of the meter using HHU or any other way, if consumer has valid positive balance. In any case consumers shall not be affected due to communication failure.

6.6 Mobile App and Web Portal for Customer

The implementation partner(s) shall provide a website portal and a mobile application (for smartphone and tablet devices using latest and commonly available browsers and operating systems and platforms) using which customer can readily access to the features extended by AMI. This portal/app and shall be part of the complete system and therefore no additional cost shall be payable for upgradation/maintenance separately. A registration process shall be provided to assure that customer access is limited to authorized users of a given account. The portal shall provide useful data in an easily understood format, for the purposes of informing customers about actual usage.

Bidders can use the existing utility mobile app, subject to meet all the features as mentioned in bid document. If bidder will provide separate mobile app then it is responsibility of bidder to do the necessary activities related to data integration and migration for providing a single/common consumer app for consumers and JKPDD.

Both the mobile app and web portal shall support all device form factors like mobile, tablet, desktop etc. through a responsive screen. It shall be Operating System and device agnostic.

Following features shall be supported by Mobile app:

- It shall work on all mobile and tablet form factors by recognizing the device details automatically.
- It shall be OS agnostic (at least all standard OS like iOS, Android)
- It shall work on all standard browsers like IE, Chrome, Safari, Firefox etc.
- Support for dial to call feature from a page.
- It shall support multiple languages.
- It shall be possible to make on-the-fly changes to the portal through a UI and immediately make these available to citizens.
- The user experience of the citizen on the Web Portal and App shall be similar in terms of look and feel, navigation, menu and access to preferences and other data.
- It shall have search functionality across all the pages.
- All licenses, security features and other tasks, for the app store, shall be in scope of bidder, with no extra cost to RECPDCL or JKPDD.

Low bandwidth support - A mobile portal as well as apps shall be able to provide services at low bandwidths also. For this, the mobile app and portals shall be tuned for low bandwidths to facilitate access of services by users when bandwidth is low.

Functional requirements for Web portal/mobile app are mentioned below:

The portal/app shall have a landing Home page. This page shall provide a brief description about the DISCOM, any promotional features or advertisement for special programs can be placed in this page. Login Component is provided and registered users may login using their username and password. New Users can also register by clicking on the First Time Users Register link. The Forgot Password link helps the user to retrieve their password. New users can register by providing their personal information and setting up of security answers. Forgot passwords can be retrieved or reset using OTP through registered mobile number or through email address. The
registered users can change their password and account information as well as registered mobile number through OTP feature.

The portal/app shall have the ability to display single/multiple account information of the users displaying information like account name, address, balance, due, status etc. Any status message pertaining to the account/s viz. alerts/actions shall be displayed here. Information about different customer engagement programs viz DSM etc. shall be displayed here. The portal/app shall have the ability to display consumption history of the user in graphical formats for at least 12 months. A more detailed analysis is provided in a tabular format listing the meter reading date, the reading, consumption, number of days, charges etc.

The portal/app shall have the ability to provide option for registering in online/paper billing to the customer. Their shall be a bill summary page that shall display bill information in summary and also option for detailed view and download in pdf format if required by customer. The use shall be able to pay bill for single and multiple accounts.

The portal/app shall have the ability to provide option for recording service requests/complaints lodged by the customer as new connection, disconnection, load change, name change, category change, meter shifting etc. The user can view the service request status. The user can register complaints viz. power failure, faulty meter, street light outage etc.

After meter installation, customer identification no., meter ID, its hardware & software configuration, name plate details, make, type i.e. 1 Phase or 3 Phase, etc. (as per requirement of DISCOM) shall be updated in HES/MDMS. This information would also be updated on the portal/app for providing information to consumers.

The MDMS shall support the web portal or shall have the ability to interface with the 3rd party portal/DISCOM portal to provide the consumer near real time online views of both usage and cost and helping consumers to understand electricity usage and cost information, alerts and notifications and energy savings tips with different levels of detail. The portal shall support the view for past electricity usage, last week’s, yesterdays, current days or other period etc. as per selection. The portal shall provide user friendly access to consumer for their data via colourful graphs and charts and can download the data into a spreadsheet.

The mobile app/portal will have the ability to allow registration for prepayment customers and display connection parameters of the existing users.

The portal/app shall also provide platform for implementation of peak load management functionality by providing existing tariff & incentives rates, participation options etc. The portal/app shall also have the ability to provide customers with interval data, flags, voltage, power quality indications etc.

The portal/app shall provide customers with access to current and historical consumption and interval data, outage flags, voltage and power quality indications. The Customer may also access data through customer portal. The solution shall integrate via a user friendly graphical interface.

The portal/MDMS shall support email/SMS notification of configured alarms & events to selected users.

The web portal or 3rd party portal/utility portal to provide the consumer near real time online views of both usage and cost, helping consumers to understand electricity usage and cost information, alerts and notifications and energy savings tips with different levels of detail. The portal shall support the view for past electricity usage, last week’s, yesterdays, current days or other period etc. as per selection. The portal shall provide user friendly access to consumer for their data via colorful graphs and charts and can download the data into a spreadsheet.

Consumer mobile app through which consumer shall be able to log in through android/iOS/Window based mobile app to see information related to its energy consumption. App shall also provide platform for implementation of peak load management functionality by providing existing tariff & incentives rates, participation options etc.

**User interface to consumer portal to access consumer’s data from MDMS for all authorized consumers shall have ability for at least the following functionality:**

- View metered data, initiate and view reports
- View data according to time of use (ToU) tariff
- Can make request for connection/disconnection
- User can update mobile number/email
- Can initiate service requests for maximum demand updating, meter checking etc.
- In case on net-metering consumers, user can view data for both import & export
In case of prepaid consumers, consumers can view recharge history & present balance. Prepaid consumers shall be provided facility to recharge their account by logging on user interface. User interface shall require consumer id., mobile number & password for secure login. This user interface shall be integrated with the present online payment gateway of utility.

6.7 Integration with DISCOMs Existing SMS Gateway

The bidder will provide the facility to send transactional SMS to registered mobiles of DISCOM’s consumer with accuracy (mobile number shall not be mismatched). The AMI Implementing Partner shall integrate the AMI solution with the existing SMS gateway of JKPDD DISCOMs for sending and receiving SMSs.

7. Inception Report

In order to ensure the better execution of the proposed work in a scientific and managerial way, the bidder shall furnish an inception report within 30 days of awarding the contract. The inception report shall contain the following:

- Detailed methodology/ project report/ modus operandi to be adopted to execute the contract.
- Resources with list of man power to be deployed to execute the contract
- Detailed list of inputs to be required from the Discom.
- Clear spell-out the obligation to be completed for execution of the work.
- Detailed Functional design & specification of the equipment's to be installed at every location with GTP (Guaranteed Technical Particulars).
- Testing procedure as per the relevant clause of the specification.
- Detailed methodology of Training system.
- Break up of total time schedule allowed for completion of supply in Gantt chart. The Gantt chart shall include milestone of approval of types and makes.
- Type of communication system proposed

The Discom on receipt of the inception report will furnish its recommendation for any modification, if required, within 15 days of receipt the same.

8. General Scope requirements

The scope of work for the AMI Implementing Agency of this tender shall include, in complete conformity with subsequent sections of the specifications, site survey, planning, design, engineering, supply, manufacturing, transportation and insurance, delivery at site, unloading, handling, storage, installation, integration, configuration, testing, commissioning, integration, demonstration for acceptance, training, maintenance and documentation of the following:-

1. Carry out Survey of site locations to assess the following:
   - Consumer Indexing
   - Smart Meter Installation
   - Network Planning for Setting up of RF Mesh Network
   - Assessment of backhaul connectivity (SIM/ MPLS/ Fibre) for data transfer from DCU/ Gateway / Router / Access Point to HES.
   - Identification of network design (equipment locations etc.) and detailing out comprehensive bill of material.
2. Implement & commission AMI system architecture capable of upgrades and scaling as per JKPDD requirements with robust System security features with due consideration of data privacy, confidentiality cyber security guidelines etc.
3. Installation, testing and commissioning of the proposed AMI solution
4. Integration with existing legacy system and upcoming DISCOM systems including Metering, Billing and Collection Systems, if required.
5. Integration of different devices/ equipment/ software's covered in scope of this project with each other as per functional requirements
6. Development of Interface with mobile app and web portal/dashboard
7. Returning of Dismantle materials to stores as per agreed SOP
8. O&M Support for the project duration. The AMI Implementing Agency shall be responsible for proper data exchange among Smart meter, MDMS, HES and other operational/ requisite software as part of fully functional AMI system.
9. Business Intelligence, Analytics and Reporting
10. Return of Dismantled materials to stores
11. Training and knowledge transfer
12. FMS and O&M of AMI system for 5 years after Go-live.
13. Bidder to submit its aftersales service support plan and escalation matrix in order to meet contractual obligations and performance guidelines. Bidder should have four service offices (as desired by RECPDCL/JKPDD) in the project areas awarded to the successful bidders as per Clause 30 of Vol-I, Section –II ITB for successful implementation of the project.
14. The bidder shall guarantee for providing service & expansion support in the aforesaid area for at least 5 years after completion of O&M period. Any upgraded network elements should have backward compatibility.
15. Specifications of hardware shall be provided along with bid and Manufactures authorization for warranty & guarantee shall be in Name of JKPDD.
16. Bidder shall provide 3rd party security audit through CERT-In/Govt. of India empanelled agencies for complete system certification.
17. For all devices which are proposed to be installed in open should have IP 55 class or higher. All proposed devices should withstand extreme weather conditions as applicable to J&K. Devices should be immune to stray Electric Fields and surges.
18. Offered solution to comply with the existing applicable BIS standards and guidelines issued by MoP/NSGM/CEA etc. for applications as mentioned in RFP & its Feasibility to change / modify the offered solution based on changes happened in standards in future.

The AMI system shall support functionalities as per "Functional Requirements of Advanced Metering Infrastructure (AMI) in India" issued by the Central Electricity Authority (CEA) in August 2016. The offered solution including (H/w, s/w, OS, licenses & others) shall have life cycle of 5 Years from post go Live.

The bidder shall ensure the possibility of up-gradation of the Firmware / software in the communication modules/devices from remote from time to time to meet the increasing demand of the system in operation / overcoming system limitations / bugs. The bidder shall also ensure incorporation of new hardware (communication devices, meter, NIC etc.), if required, in future. The bidder therefore shall ensure that all such upgrades shall seamlessly fit into the existing end to end system in operation and shall be backwardly compatible to the earlier generation devices / software / Firmware in operation to guard against obsolescence at no cost to JKPDD during the contract period.

The quantity of all equipment/materials given in the Price Schedules of the bidding documents are provisional. The variation in quantity shall be limited to plus/minus (+/-) thirty percent (30%) for the individual items. Further, before award of contract, the final quantity may vary based on the available budget and cost discovered through tendering process.

All network communications equipment shall support local (on-site) and remote (system head end) nonintrusive diagnostics capable of detecting any abnormal operating parameters including, but not limited to, network communications, memory failure, power supply failure, firmware/software problems etc.

It shall be the responsibility of solution provider to resolve any communication and IT Infrastructure related issues of meters and IT Infra of different OEMs.

9. Project Management and Schedule

9.1 Project management
The bidder shall assign a project manager with the authority to make commitments and decisions that are binding on the Contractor. Purchaser will designate a project manager to co-ordinate all purchaser project activities. All communications between purchaser and the Contractor shall be coordinated through the project managers. The project managers shall also be responsible for all communications between other members of the project staffs.

9.2 Project Schedule
The project implementation schedule is from date of detailed order. Based upon this schedule the bidder shall submit a preliminary implementation plan along with the bid. The detail project implementation schedule shall be submitted by the contractor after award for purchaser’s approval, which shall include at least the following activities:

- Site Study
Documents submission and approval schedule.
Factory & Site Testing Schedule.
Database development schedule, software development & integration schedule.
Installation schedule.
Training schedule.

The project schedule shall include the estimated period for completion of and its linkage with other activities. Major mile stones with their corresponding timelines are as under:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Task/ Milestone</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acceptance of contract</td>
<td>T+ 2 Days</td>
</tr>
<tr>
<td>2</td>
<td>Submission of Bank Guarantee &amp; PERT Chart</td>
<td>T+ 28 Days</td>
</tr>
<tr>
<td>3</td>
<td>Supply, Installation, Integration, Commissioning &amp; Go-live of complete AMI system</td>
<td>T1 = T+36 Months</td>
</tr>
<tr>
<td>4</td>
<td>FMS and O&amp;M including Warranty period</td>
<td>T2= T1 + 60 Months</td>
</tr>
</tbody>
</table>

10. Installation of Advanced Metering Infrastructure (AMI)

The smart meter along with communication network installation shall be done by the AMI Implementing Agency as per the installation guidelines of the JKPDD.

10.1 Smart Meter Installation

The scope of installation work is two-fold and shall include the cost of all labour (electrical, civil and others), materials, tools and other incidental expenses in connection with additional labour requirement. The bidder shall seek for approval from JKPDD for installing smart meters. The details are:

10.1.1 Meter Inventory Management

Meter management and installation shall be the responsibility of the bidder once meter installation is approved by JKPDD. Any physical damages including fire and theft and damages not covered by OEM shall be the responsibility of AMI Implementing Agency.

10.1.2 AMI Site Survey

The broad scope of site survey will include the following but are not limited to;

- Capturing complete existing meter details (Meter type, make, class, serial no., YOM, attached consumer, etc.)
- Conducting feasibility analysis of the RF Mesh/ GPRS connectivity at individual sites and capture details. Although GPRS based NIC cards shall be limited to 10% maximum of total quantity with prior approval from JKPDD
- Capturing details of newly installed smart meters.
- The master data populated after AMI site survey shall be in-line with the consumer indexing survey to ensure data consistency and simultaneous update of consumer indexing.
- Agency to ensure that the master data of the AMI system is in sync with that of the RAPDRP Systems.

10.1.3 Meter Installation

The bidder shall prepare a SOP (standard Operating Procedure) document for meter installation in consultation with JKPDD and Meter installation activity shall adhere to this document. Installation services shall be performed in a professional and courteous manner, from initial appointment setup to final installation of the meter. Customer service, effective project team and customer communication are of the utmost importance to this project. All site installation personnel employed on this project will be subject to background checks and shall, at all times, carry a suitable Govt. issues photo ID (such as Driving License, Voter Card, Aadhaar etc.) for identification.

All the meters are proposed to be installed on Poles. There will be 3 combinations of Meter boxes used to install the single phase meters i.e. Meter Box with One Meter, Meter Box with two Meters & Meter Box with 4 meters. All three phase meters will be installed in single box. The specification of single phase & three phase meter box are provided along with indicative drawing for 2/4 meter box. Subsequent specs & technical details for 2/4 Meter boxes will be submitted by bidder for approval for Project execution.

It is proposed to replace some of the damaged Service cables of old meters based on the Survey report. All the activities for installation of new cable with clamps & connectors along with removal of old cables is in the scope of bidder.
Scope of AMI Implementing Agency shall include but not limited to:

- Removal of Old Meter & taking down the meter reading
- Installation of new smart meters with NIC card
- Install SIM Card in the meter, DCU/router/Gateway/Access point & activate / register new meters with Head End System & MDMS
- Transfer Old & new meter data to the DISCOM (DISCOM Billing Software)
- Provide or capture meter location through GPS
- Digital photograph of meter reading before and after installation
- Train the DISCOM installation personnel
- Manage the installation performance
- Provide daily, real-time project status updates of installations to JKPDD

Most of the installations are meter replacement cases the bidder shall adhere to CEA Regulations on "Installation and Operation of Meters', 2006 to be read in conjunction with amendments dated 04 June 2010 and 26 November 2014.

10.1.4 NIC/SIM card management
AMI Implementation Agency shall ensure the availability, insertion and management of The NIC cards to be used in RF Mesh communication module of smart meters. However, GPRS SIM will be provided by JKPDD to the AMI Implementation Agency. The installation and replacement of SIMs at site shall be in scope of AMI Implementation Agency (IA). In order to pursue this, following points need to be ensured by the system Integrator.

- Procurement and availability of RF NIC cards from NBSP before the installation starts.
- AMI Implementation Agency will be responsible for management of SIM inventory including but not limited to total installed, in-stock, replaced and rejected/suspended/ terminated NIC or SIMs.
- AMI Implementing Partner shall ensure that the NIC and SIM information is available in the head end system before physical installation is carried out.
- AMI Implementing Partner shall ensure quality aspect of physical NIC or SIMs from NBSP along with the maintenance of buffer stock of NIC and SIMs & their activation - deactivation.
- AMI Implementing Partner shall ensure timely suspension, termination, activation and reactivation of NIC or SIMs and the process shall comply to the prevailing regulations of DoT / TRAI & shall be approved by RECPDCL.
- AMI Implementing Partner need to monitor the usage, alarm, events and connectivity of NBSP core components for the SIM cards used in AMI solution.
- NIC and SIMs needs to be preconfigured for activation before meter installation begins and SI shall work in close coordination with Telecom Service Providers.
- AMI Implementation Agency shall ensure that communication module is properly sealed after NIC or SIM insertion before installation.
- Replacement of faulty NIC and SIM cards as per the agreed SLA.
- Provide daily, real-time project status updates of installations to RECPDCL & JKPDD.

10.2 Communication Network installation

The bidder shall have to install & commission full-fledged communication network. The location of DCU/access points/routers/repeaters shall be such that signal strength shall be maximum, confirming the requirements of technical specifications. The entire infrastructure like poles & associated civil works required for installation & commission of equipment/devices like repeaters, routers & access points shall be in the scope of Contractor.

Mounting of DCU/access points/routers/repeaters can be on wall or distribution poles, or separate supporting structure based on the requirement of communication technology. Pole mounting/wall mounting shall be done with proper galvanized iron flats/strip to pole designed for weight of that equipment/device. It shall be locked and protected for secured access of utility staff only. Field equipment/device must be protected against ingress of water/moisture/dust/insect and weather conditions at Jammu & Kashmir region.

10.3 Installation Acceptance

Utility Project in-charge shall check on the quality of installation by checking wiring methods and its integration with AMI backend system by performing basic data communication with the HES application. On successful test and field quality check the Utility In charge engineer will certify for acceptance to contractor.
11. Integration with other systems

MDM shall preferably interface with other systems on standard interfaces and the data exchange models and interfaces shall comply with CIM / XML / IEC 61968/IS15959/ Indian Companion Specification/ any other open standard. MDM solution shall be Service Oriented Architecture (SOA) enabled.

MDM integration with other systems shall include but not limited to the following:

- HES for data exchange from other AMI solutions
- Utility Administration
- Existing other Data Collection Systems
- IVR system, CRM, Consumer Portal
- Billing and collection system
- Revenue Management System
- GIS Systems integration with CIS and with MDM system support of interface with HHU or manual reading system etc.
- Energy Audit
- Business intelligence system for MIS and other report generation required by JKPDD

AMI Implementing Agency (AIA) should provide suitable number of HHUs to read and update the data in MDM in case of any communication failure between meter and HES/MDM.

Data migration (if required) from existing oracle MDM to new MDM database shall be in the scope of bidder. Bidder has to develop a user interface( web based application, that should run on JKPDD sub-division offices or other meter reading/ data collection centers) for manual data entering of non-AMR meters directly to MDM for further processing’s related to billing, collection and analysis. For AMR based meters (already installed or future installation) MDM need to integrate with MDAS application of these meters available at JKPDD.

12. Data Polling Frequency from different Type of Meters

Below mentioned data polling frequency shall be predefined in meters, HES, DCU and other related components of AMI system. However, it shall be possible to change the data polling frequency through remote command from HES. On-demand operation shall be performed on real time as well as scheduled basis for all parameters.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>3P WC Consumers Meters</th>
<th>Single Phase Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantaneous</td>
<td>Hourly</td>
<td>Hourly</td>
</tr>
<tr>
<td>Name Plate</td>
<td>Node Reboot</td>
<td>Node Reboot</td>
</tr>
<tr>
<td>Load Profile Data</td>
<td>Hourly</td>
<td>Hourly</td>
</tr>
<tr>
<td>Billing Data</td>
<td>Monthly</td>
<td>Monthly</td>
</tr>
<tr>
<td>Midnight Data</td>
<td>Daily</td>
<td>Daily</td>
</tr>
<tr>
<td>Critical Events as Alarm</td>
<td>On Occurrence/ On Restoration</td>
<td>On Occurrence/ On restoration</td>
</tr>
<tr>
<td>All Events as Info</td>
<td>Daily</td>
<td>Daily</td>
</tr>
<tr>
<td>Events Snapshot</td>
<td>Daily</td>
<td>Daily</td>
</tr>
<tr>
<td>Programmable Parameters</td>
<td>On-Demand</td>
<td>On-Demand</td>
</tr>
<tr>
<td>Connect/ Disconnect</td>
<td>On-Demand</td>
<td>On-Demand</td>
</tr>
<tr>
<td>Time Sync</td>
<td>Difference &lt;60 Seconds</td>
<td>Difference &lt;60 Seconds</td>
</tr>
</tbody>
</table>

13. Service level agreement (SLA)

13.1 SLA during FMS and O&M period

- These performance levels shall apply to the complete AMI system.
- AMI system include the communications links provided by Network Provider /third parties such as telecommunications companies and bidder has to ensure the desired performance level.
- The performance levels exclude force majeure events. For SLA calculation all exceptional cases not attributable to contractor like – power failure, Communication through SIM provided by JKPDD, power quality, sabotage, defective / disconnected meter will be excluded from the calculation.
- It is responsibility of bidder to capture the billing data through CMRI/HHU in case communication network is down during billing period.

The following are the required performance levels for an AMI Systems, which should be met on a daily basis-

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Performance Requirement</th>
<th>Penalty</th>
</tr>
</thead>
</table>

Table: AMI System SLA
<table>
<thead>
<tr>
<th>Data Type</th>
<th>Performance Requirement</th>
<th>Penalty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Scheduled Interval data readings at a fixed periodicity during the day as decided by utility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodic collection of the 30-minute block profile data after every 60 minutes</td>
<td>From 95% of meters within 5 minutes</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>From 98% of meters before next periodic packet is scheduled.</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td><strong>2. Scheduled daily meter readings (as per IS 16444/15959)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily collection of the previous day's interval energy data and total accumulated energy</td>
<td>From 95% of meters within 8 hours after midnight; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>From 99% of meters within 24 hours after midnight</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td><strong>3. Scheduled billing/ load profile data for bill period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection of billing/load profile data for the bill period for entire installed population</td>
<td>From 95% of meters within 24 hours after midnight; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>From 99% of meters within 48 hours after midnight</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td><strong>4. On-Demand Remote reads of meters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection of 7 days of interval energy data and the current total accumulated energy from a group of 1000 AMI meters</td>
<td>Action performed at 90% of meters within 1 Hour; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>Action performed at 95% of meters within 2 hours; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>Action performed at 99% of meters within 6 hours</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td>Collection of 7 days of interval energy data and the current total accumulated energy from a selected individual meter</td>
<td>Action performed within 60 seconds</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td><strong>5. Ping Response with acknowledgement/ response for selected meters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For a group of 1000 meters</td>
<td>Action performed at 99% of meters within 5 minute; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td>For an individual meter</td>
<td>Action performed within 30 seconds</td>
<td></td>
</tr>
<tr>
<td><strong>6. Remote load control commands for selected meters with acknowledgement/ response for selected meters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For a group of 1000 AMI meters</td>
<td>Action performed at 95% of meters within 5 minutes; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>Action performed at 99% of meters within 10 Minutes</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td>For an individual meter</td>
<td>Action performed within 30 seconds</td>
<td></td>
</tr>
<tr>
<td><strong>7. For remote connect/disconnect with acknowledgement/ response for selected meters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For a group of 1000 AMI meters</td>
<td>Action performed at 90% of meters within 5 minutes; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>Action performed at 95% of meters within 10 minutes; and</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td></td>
<td>Action performed 99% of meters within 20 minutes</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td>For an individual meter</td>
<td>Action performed within 30 seconds</td>
<td></td>
</tr>
<tr>
<td><strong>8. Meter loss and restoration of supply</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving of alert for affected AMI meters</td>
<td>Alert to be received within 5 minutes for 60% of meters</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
<tr>
<td><strong>9. Meter Tamper Alerts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving of alert for an individual</td>
<td>Alert to be received within 5 minutes</td>
<td>As per below Table: Penalty Table for SLA</td>
</tr>
</tbody>
</table>
10. Power Quality Alerts

| Receiving of alert for an individual meter | Alert to be received within 5 minutes | As per below Table: Penalty Table for SLA |

11. Remotely altering settings in meter/ firmware upgrade with acknowledgement/ response for selected meters

| For a group of 1000 AMI meters | Action performed at 95% of meters within 24 Hours; and | As per below Table: Penalty Table for SLA |
| | Action performed at 99% of meters within 36 Hours | As per below Table: Penalty Table for SLA |

12. Remotely read events logs

| For reading the full event log for a group of 1000 AMI meters | Action performed at 90% of meters within 30 minutes; and | As per below Table: Penalty Table for SLA |
| | Action performed at 95% of meters within 1 hour; and | As per below Table: Penalty Table for SLA |
| | Action performed at 99% of meters within 6 hours. | As per below Table: Penalty Table for SLA |

For the above performance requirement, a designated team/ person from RECPDCL/JKPDD will review the performance of supplier against the SLA after every 90 days. Post evaluation, an audit report of the same will be submitted by the AMI Implementation Agency to the RECPDCL/JKPDD.

Further, for meeting SLAs as defined above (except SLA number 4), MDMS should be able to generate standard reports for these parameters. During performance evaluation, the generated reports shall be randomly checked with data by the designated team/ person from RECPDCL/JKPDD.

13.2 User interface performance SLA

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>User Interface requirement</th>
<th>Response Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Any real time display and application display on workstation console along with data values shall appear on screen</td>
<td>Within 10 sec</td>
</tr>
<tr>
<td>2</td>
<td>Manual data entry of the new value appears on screen</td>
<td>Within 10 sec</td>
</tr>
<tr>
<td>3</td>
<td>Display Update rate</td>
<td>10 sec for 4 displays together</td>
</tr>
<tr>
<td>4</td>
<td>Response time for display of Alarm and event after receipt in system</td>
<td>Within 5 sec of receipt in system</td>
</tr>
<tr>
<td>5</td>
<td>Requests for printing of displays (to be acknowledged with an indication of request is being processed)</td>
<td>Within 10 sec</td>
</tr>
<tr>
<td>6</td>
<td>Requests for generation of reports (to be acknowledged with an indication of request is being processed)</td>
<td>Within 10 sec</td>
</tr>
</tbody>
</table>

Applicable Penalty

The following operational penalties shall be applicable on the basis of SLA Parameters on the Bidder and shall be calculated as here under:

**Table: Penalty Table for SLA**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particular</th>
<th>Extent of penalty / No Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;=99%</td>
<td>No penalty</td>
</tr>
<tr>
<td>2</td>
<td>&gt;= 80% to &lt; 99%*</td>
<td>No payment towards non-reporting consumer Meters. Additionally, penalty at the rate of 0.5% of percentage by which the SLA falls below 99% shall be deducted from the monthly invoice of the vendor.</td>
</tr>
<tr>
<td>3</td>
<td>Below 80 %</td>
<td>No payment shall be made for respective quarter</td>
</tr>
</tbody>
</table>
for e.g. - If communicated meter per lot per month are 91% then the bidder shall be paid 91% of O&M cost minus (-) 0.5% of (8% (difference from 99%)) i.e. 4% of O&M cost, penalty on the invoice value.

Note:

(i) The bidder shall ensure 100% data availability for billing and none of the consumers shall be billed on average for two consecutive billing cycles.
(ii) The firm shall furnish the communication report as per SLA along with the payment invoices. The HES/NMS should have such feature to get date and time wise report meter communication status.
(iii) The designated officer of the utility shall verify and certify the invoice through system generated reports; bidder shall provide an interface for verification of the invoice in the software to facilitate the verification authority to compute the availability of meter data on system and amount of applicable penalty.
(iv) If the defective or damaged materials are not replaced within 15 days from the date of receipt of the intimation from the RECPDCL/JKPDD of such defects or damages, then a penalty of 0.5% per week or part thereof, subject to maximum 10% of O&M cost of that material in addition to SLA shall be applicable.
(v) Integration Providing Consumer meter consumption data in a desired template of the DISCOM System approved by RECPDCL/JKPDD.
(vi) All percentages for SLA are to be calculated over monthly. Average of three months will be taken as quarterly performance.

14. Operation & Maintenance
14.1 General Requirement:

- Bidder should provide all the updates free of cost during warranty and O&M period. Bidder should also provide the required training to the users for operating, developing system and administrative training to selective persons for running system after support period free of cost.
- Bidder has to provide all the supporting 3rd party software which it recommends for operation of the system free of cost till the O&M period.
- Any software updates, upgrades, patches released till the completion of warranty period shall be supplied, installed and commissioned under scope of agreement / PO / RC. Training to JKPDD employees on software from the OEM or OEM’s certified training partner shall be arranged by the bidder. Bidder shall maintain the system on 24x7 basis during and after warranty period as per agreed SLA.
- The Software licenses will be in the name of JKPDD and will be perpetual in nature.
- System will operate in English (British / US) language.
- System should have a reporting system in GUI form which can plot any report using different parameters of meters for user analysis purpose.
- Bidder to provide software upgrades till O&M period to ensure smooth working without additional cost to JKPDD.
- The bidder shall depute the requisite manpower at appropriate levels across the project area for upkeep of the Advanced Metering Infrastructure (Meters/DCU/Communication Modules) installed at sites.
- The bidder has to deploy the requisite manpower (on site deployment) at appropriate levels for maintenance of the software system, undertaking change requests, report generation etc.
- DISCOM shall install any new installations or site that being serviced and the required infrastructure for acquiring the data form the same based on the category and type of installation shall be supplied and commissioned.
- The bidder has to maintain and continually monitor the assets installed and see to that all the infrastructure is working for providing seamless data acquisition.
- The bidder shall acquire the data within the defined SLA of the RFP.
- The bidder has to impart training to the DISCOM officers for using the application as and when required by DISCOM.
- The bidder has to provide all the user manuals and documentation with respect to the project to DISCOM. The training and user manuals shall also be made available online in the Web application and shall be updated as when the system is updated or changed.
- Any additional reports required during the tenure of contract shall be developed and made available online.
14.2 Maintenance & Support services

14.2.1 Introduction

The scope of maintenance work shall include a comprehensive maintenance of all the software and hardware provided by the contractor for the various systems and components of AMI system under this project. The maintenance practices to be followed shall be as per ISO 20000 Standard. The essence of the maintenance services is to provide maintenance support for the designated hardware and software, with the goal of meeting the availability as set forth herein. System Integrator (SI) is to handhold the EMPLOYER/UTILITY team to take over all maintenance and support services after completion of SI’s O&M period. The project/ system devices should allow their functionalities to be upgraded without disruption to the existing functionalities by downloading new software and configuration information.

14.2.2 Maintenance support

The period of maintenance support shall be five (5) years from Go-Live/Operational Acceptance by JKPDD/RECPDCL. System availability requirements during the maintenance period shall be as described in the Table below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>System</th>
<th>System Availability requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Advanced Metering Infrastructure System (AMI System)</td>
<td>99.5%</td>
</tr>
</tbody>
</table>

The system availability shall be measured for entire System. Similarly, the availability of various systems of AMI elements Hardware and Software, Field devices, Communication & Networking Systems shall be considered separately. Individual device availability shall be at least 98%.

For all third party equipment (Hardware & Software) and services (communications) Contractor shall have back to back support along with supply of spare and service level agreement with appropriate response time from OEM/OEM Authorized representatives. Contractor shall be responsible for coordination with the OEM for all matter related to that equipment. Contractor shall also be responsible for meeting the overall response times and availability requirements specified in RFP.

The maintenance of the System shall be comprehensive and shall comprise of the following category of works which is further elaborated for each of the different subsystems:

(a) Preventive Maintenance Activity (performance monitoring, system backup, patch management, updates and troubleshooting)

(b) Maintaining a minimum no. of specified spares.

(c) Integration of new equipment (Field devices, central systems, Communication & networking systems) and integration of a new or existing central system.

14.2.3 Preventive Maintenance Activity

The preventive maintenance activity shall be performed by the Contractor to keep the system running at optimum level by diagnosis and rectification of all hardware and software issues and would broadly include following.

- There should not be any unnecessary and unscheduled downtime of system services.
- Configuration of the replaced hardware and software, periodic routine checking as part of a preventive maintenance program (as described in further detail in this document) which would include checking of functionality of hardware and software,
- Monitoring of the performance of the system and doing necessary tuning for optimum performance to accommodate any changes such as addition of new components.
- Providing all necessary assistance to Employer/Utility for addition and modification of database and displays, Database sizing activities including Backup and restore of the system.
- Restoration of the systems upon its failure and to restore the functioning of the various systems at the central systems
- Log analysis in developing issues

Routine works and other day-to-day operational activity would primarily be the responsibility of Owner and in case of any difficulty in this regard the same shall be referred to the contractor for support.

**Hours of Cover**

The Contractor shall provide engineers who have an experience and skill to maintain the AMI System to the desired level of availability. The contractor's on-site support for central systems, shall be standard hours of service as per JKPDD, excluding public and Owner Company holidays, throughout a year. At least one experienced personnel having expertise in AMI System shall be available during the standard hours of service. The timings for Emergency Support would be 24 hours a day, 7 days a week throughout the year.

The support personnel so deployed shall be qualified personnel having experience in the delivered AMI elements/parts. The contractor shall submit the CV's and recommendation letter from customers for all support personnel(s) to Employer/Utility for approval before deployment at site. The Employer/Utility can ask the Contractor to replace the personnel deployed for maintenance support if his performance is not found to be satisfactory.

**Service Response requirements**

The severity levels are defined in coming sections and the requirement of response time for various severity levels is defined below:

Emergency Support for Severity 1 issues are to be provided 24 hours a day, seven days a week. The on-call support team shall include all key technical competencies so that any aspect of a system failure can be attended. The team shall comprise of experienced technical staff that are skilled in troubleshooting of the various systems covered under O&M. Severity 1 problems shall be reported by telephone for rapid response; target response times are defined in this section. For severity 1 problems, the key objective is to restore the system to an operational state as quickly as possible, including by a temporary workaround. Resolution of the defect may be completed during standard hours.

Severity 2, 3, and 4 problems shall be reported by Owner/Employer/Utility through a call tracking system to be provided by the contractor. Resolution of problems may also be provided by an individual fix that will be installed by the contractor at no extra cost to Owner.

**14.2.4 Monitoring**

The operation and performance of the various systems under O&M shall be monitored on a bi-weekly basis; the contractor shall review the following, analyze the results, and submit report to Owner. The contractor shall conduct at least the following monitoring, for the AMI system.
Log Monitoring

- System logs for a selected day
- System history log
- Aggregate data collection
- Events Collection

During monitoring if any defect/abnormality is found, the contractor shall undertake corrective maintenance for the same.

Resource Monitoring

Resource Monitoring services comprise checking the system’s major node resources, gather log data, analyze results, and advise Owner/Employer/Utility on the appropriate actions to be taken and undertake any agreed upon actions. The supplied system tools shall be used to continuously collect the following information:

- CPU loading (Peak and Average)
- Memory utilization (Peak and Average)
- Disk utilization (Peak and Average)
- LAN/WAN utilization (Peak and Average)
- Operating system resource utilization
- System error log

The SI shall submit the procedures details to meet the above along with the offer.

Cyber security System monitoring

The Contractor shall also be responsible for monitoring of the cyber security system, as proposed. The logs of the system shall be analyzed for exceptions and the possible incident of intrusion/trespass shall be informed to the Employer/Utility.

The monitoring shall encompass the various cyber security devices installed at Control Centre such as firewalls, Intrusion prevention system (both network based and host based), routers. The Centralized Monitoring Console (CMC) shall monitor and continuously collect the above logs. The Cyber security system shall also be subjected to Annual Security Audit from CERT-In listed auditors at the cost of the Contractor. Contractor shall implement the recommendations/remedial actions suggested by the Auditor after audit.

14.2.5 Patch Management

The contractor shall also be responsible for providing updates/patches for the software products supplied under the project. All other patches of third party product like Operating System and Anti-virus shall be tested by the Contractor prior to installing in the Employer/Utilities network. Other products like IPS, Network IPS, Host based IPS, Firewalls shall also be provided with secure patch management. A secure patch management and deployment system is to be established which shall be provided with single point of Internet connectivity. All the patches shall be downloaded through this single point of connection. Internet connection shall also be provided and shall be shown in System Architecture diagram submitted during Bid submission.

Software updates and patches shall be applied while the system is in operation and shall not require a reboot (e.g. applied to one processor in a dual processor configuration). A secure (e.g. https) remote method of initiating a rollback to the software prior to the update or patch shall be provided.
SI to describe the method proposed to securely apply software updates and patches. SI to also specify the method proposed to use to securely initiate a rollback to the software state prior to an update or patch.

The Contractor shall describe a mechanism for patch management so that it is known that what patches have been applied, what all patches are pending but available with us and what is the recent release of patches for the various products as part of cyber security documentation. Any patch shall be applied only with express permission of the Employer/Utility’s representative.

14.2.6 Physical maintenance

The contractor shall undertake physical maintenance of all equipment/modules under the scope of this contract, in accordance with this section. The physical maintenance shall include cleaning, dusting, inspection of equipment for loose connections, damage to insulation, pest infections etc. Equipment shutdown approval for preventive maintenance shall be required from Employer/Utility.

14.2.7 Spares inventory

The Contractor shall maintain a spares inventory at his own cost to meet the spare availability requirements of the system. The spares shall be used as and when required and no separate charges are payable except the maintenance charges. The Contractor shall decide the items and components to be maintained as spare but a minimum number of spares but not limited to as given Table below shall be kept at the respective Centres. This shall be periodically verified by the Employer/Utility. If the replenishment of the spare takes more than 30 days then it will be considered as non-availability as per Severity-2.

<table>
<thead>
<tr>
<th>S No.</th>
<th>Item Description</th>
<th>Unit</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Servers</td>
<td>Lot</td>
<td>1*</td>
</tr>
<tr>
<td>B</td>
<td>Work Station</td>
<td>Lot</td>
<td>1*</td>
</tr>
<tr>
<td>C</td>
<td>Routers &amp; Switches</td>
<td>%</td>
<td>10</td>
</tr>
<tr>
<td>D</td>
<td>Communication Equip.</td>
<td>%</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>Field Devices</td>
<td>%</td>
<td>10</td>
</tr>
<tr>
<td>F</td>
<td>Meters</td>
<td>%</td>
<td>5</td>
</tr>
</tbody>
</table>

* Note: One of each Type Supplied as part of system. Wherever one configuration can replace multiple type of elements supplied only 5% (Minimum) such equipment shall be taken as spare

14.2.8 Integration of new equipment

All future Field devices & other System integration shall be the responsibility of contractor and shall be part of the maintenance charges without any other additional cost burden to employer/utility.

14.2.9 Problem/Defect Reporting

The SI shall propose an appropriate problem/defect reporting procedure to meet the requirement of all severity level cases along with the offer.

The problems will be categorized as follows:
Any major sub-system / system or its components, which may significantly impact the system availability, performance, or operational capability subsequently could result into Severity-1 category outage, loss of an important subsystem that may affect Coverage under this severity would be outages that do not immediately cause online data loss but subsequently could result into Severity-1 category outage, loss of an important subsystem that may affect the day-to-day works and loss of archived data.

**14.2.10 Severity levels**

The detail of the systems under different severity levels is as below:

**Severity-1 (Urgent support)**

This support is required when there is a complete system failure, severe system instability, the loss/ failure of any major sub-system / system or its components, which may significantly impact the system availability, performance, or operational capability at central system. For example, loss of data to the operator due to any problem software/Hardware-related in AMI System, outage of any important software functionality which is required to discharge operational functions, outage of both main and standby routers, and loss of data exchange with other computer systems or other Central systems would be included under this category. The failure of complete UPS (uninterrupted Power Supply) system resulting into loss of UPS output supply at both Output ACDB is covered under this category.

Upon receiving intimation, the representative of the contractor would immediately attend to the problem. The problem shall be attended by the contractor at the earliest, and it shall arrange all resources and take all steps to restore the data availability and functionality at the earliest.

**Severity-2**

Degradation of services or critical functions such as to negatively impact system operation. Failure of one Data Server, stoppage of data collections for archiving, at the respective Central system, and outage of other applications not covered under severity-1 are included in this category.

Failure of one UPS system, Failure of Battery System and failure of any other system of Auxiliary

Power supply not covered under Severity-1 are included in this category.

Coverage under this severity would be outages that do not immediately cause online data loss but subsequently could result into Severity-1 category outage, loss of an important subsystem that may affect the day-to-day works and loss of archived data.

**Table Severity Levels**

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity 1 – Urgent</td>
<td>Complete system failure, severe system instability, loss or failure of any major subsystem or system component such as to cause a significant adverse impact to system availability, performance, or operational capability</td>
</tr>
<tr>
<td>Severity 2 – Serious</td>
<td>Degradation of services or critical functions such as to Negatively impact system operation. Failure of any redundant system component such that the normal redundancy is lost. Non-availability of Man-power at Central system during working hours, non-availability of spares</td>
</tr>
<tr>
<td>Severity 3 – Minor</td>
<td>Any other system defect, or unexpected operation not covered under severity 1 or 2</td>
</tr>
<tr>
<td>Severity 4 General/Technical Help</td>
<td>Request for information, technical configuration assistance, “how to” guidance, and enhancement requests.</td>
</tr>
</tbody>
</table>
Failure of any redundant system component affecting the critical redundancy would also be included in this category.

Non-availability of designated contractor’s Man-power at central system as well as required inventory of spares specified here will also be covered under this category.

Severity-3 (Standard support)

The support services included under this category are when the outage or loss of functionality is neither of an emergency nor priority functionalities as indicated in severity level 1 or 2 above.

Severity-4 (General Technical Help)

Request for information, technical configuration assistance, “how to” guidance, and enhancement requests are included under this category.

14.2.11 Response and Resolution Time

This section describes the target times within which the contractor should respond to support requests for each category of severity. The Initial Response Time is defined as the period between the initial receipt of the support request (through approved communications channels) and the acknowledgment of the contractor. The Action Resolution Time is the period between the initial response and the contractor delivering a solution. This period includes investigation time and consideration of alternative courses of action to remedy the situation. The Action is defined as a direct solution or a workaround.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Initial Response time(Working Hours)</th>
<th>Initial Response Time(Non-working hours)</th>
<th>Action Resolution Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 minutes</td>
<td>30 minutes</td>
<td>2 hours</td>
<td>An urgent or emergency situation requiring continuous attention from necessary support staff until system operation is restored – may be by workaround.</td>
</tr>
<tr>
<td>2</td>
<td>5 minutes</td>
<td>2 Hours</td>
<td>24 Hours</td>
<td>Attempt to find a solution acceptable to Owner/ Employer/Utility (dependent on reproducibility), as quickly as practical.</td>
</tr>
<tr>
<td>3</td>
<td>2 hours</td>
<td>1 day</td>
<td>2 days</td>
<td>Evaluation and action plan. Resolution time is dependent on reproducibility, ability to gather data, and Owner/ Employer/Utility’s prioritization. Resolution may be by workaround.</td>
</tr>
<tr>
<td>4</td>
<td>2 hours</td>
<td>1 day</td>
<td>2 days</td>
<td>Report on the problem/query is to be furnished.</td>
</tr>
</tbody>
</table>
14.2.12 Availability and maintenance charges payment Calculation

It is the endeavour of both the contractor and Owner to maximize system availability to the extent possible. The contractor shall provide guaranteed availability for various types of Severity levels as specified in section above.

The non-availability hours for availability calculation shall be counted from the end of the allowed Action Resolution time. A standardized register shall be maintained at each site containing full details of each outages, actions taken by Owner to correct the problem, applicable Severity level, time of reporting to the contractor support engineer/support centre pursuant to the appropriate methods in the Agreement, allowed Response time as per the Response times defined in above section, actual Resolution time, and signature of Engineer-in-charge as well as the contractor’s support engineer of the site.

Duration of outages over and above the Action Resolution time in each of the Severity levels shall be counted for the non-availability computation and shall be clearly brought out in the register. The resolution may be accomplished by a work around, and such solution shall mark the end of non-availability.

In the event of multiple failures at a site, due to a common cause, the first FPR (Field Problem, Report) logged shall be used for the purpose of availability calculation.

Availability computation for System

Availability computation shall be done on per quarter per site basis. The formula to be used for availability computation shall be as under:

\[
\text{Availability per quarter (per site)} = \left( \frac{\text{THQ} - (S1 \cdot 1 + S2 \cdot 0.8 + S3 \cdot 0.5)}{\text{THQ}} \right) \cdot 100
\]

Where THQ is total hours in the quarter

S1 is the total non-available hours in Severity Level-1

S2 is the total non-available hours in Severity Level-2

S3 is the total non-available hours in Severity Level-3

14.2.13 Payment of maintenance charges (based on AMI availability)

In the event of availability below a certain level, the maintenance charges would be proportionately reduced as follows: The same shall be applicable for the Auxiliary Power supply system with the availability specified for the respective systems.

<table>
<thead>
<tr>
<th>Availability of central system / quarter</th>
<th>% Deduction in FMS/O&amp;M charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;99.5%</td>
<td>• NIL</td>
</tr>
<tr>
<td>&lt; 99.5%</td>
<td>• Deduction of 1% of quarterly FMS charges for every 0.5% or part thereof decrease in availability under 99.5% subject to a maximum of 50% of quarterly FMS charges</td>
</tr>
</tbody>
</table>
14.2.14 Computation of Availability / Non-availability

The computation of Availability / Non-availability would be rounded up to 2 decimal places on quarterly basis and any deduction in the maintenance charges thereof would be calculated as stated above in aforementioned Section on pro-rata basis.

14.2.15 Contractor’s Obligations

In order to optimize and improve the response of the system, the contractor may re-install the program modules in consultation with and after making the Owner / Employer/Utility engineer aware of the consequence (like data loss, database rebuild etc.)

Any modification of Field devices, software/Operating System required to restore functionality due to hardware upgrades, patches, or arising out of a necessity to fix FPRs (Field problem reports), would be done by the contractor at no extra cost to Owner / Employer/Utility.

The contractor will submit FSR (Field Service Report) and the steps taken to solve the problem, along with details of code changes.

14.2.16 Responsibilities of Owner /Employer/Utility

The responsibilities of the owner during the maintenance period are as follows:

(a) Employer/Utility shall ensure that proper Environmental conditions are maintained for the system.

(b) Employer/Utility shall ensure that the System is kept and operated in a proper and prudent manner as described in the system documentation provided by the Contractor and only trained Employer/Utility representatives (or persons under their supervision) are allowed to operate the system.

(c) Employer/Utility shall provide access to the sites of installation for purposes of providing Support Services.

(d) Employer/Utility shall provide the contractor with Space for Office for their maintenance staff and storage for spares.

Responsibility Matrix

The table in this section provides a summary definition of the roles and responsibilities of the contractor.

<table>
<thead>
<tr>
<th>Item</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>PROBLEM IDENTIFICATION</td>
</tr>
<tr>
<td>0.1</td>
<td>Root cause analysis to determine whether the fault is attributable to Hardware or Software.</td>
</tr>
<tr>
<td>0.2</td>
<td>Resolution of problems involving third party maintainer where there is uncertainty whether the root cause is hardware or software.</td>
</tr>
<tr>
<td>1.0</td>
<td>SOFTWARE PROBLEM RESOLUTION</td>
</tr>
<tr>
<td>1.1</td>
<td>Report problem and assist with problem identification</td>
</tr>
<tr>
<td>1.2</td>
<td>Provide or recommend corrections, temporary patches, workarounds or other fixes to system</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>problems</td>
</tr>
<tr>
<td>1.3</td>
<td>Install and test corrections, temporary patches, workarounds or other fixes to system problems</td>
</tr>
<tr>
<td></td>
<td>ROUTINE SOFTWARE SUPPORT</td>
</tr>
<tr>
<td>2.0</td>
<td>Build and maintain database, displays and reports</td>
</tr>
<tr>
<td>2.1</td>
<td>Perform system back-ups</td>
</tr>
<tr>
<td>2.2</td>
<td>Restore or reinstall software from back-ups</td>
</tr>
<tr>
<td>2.3</td>
<td>Monitor system logs (part of remote monitoring service)</td>
</tr>
<tr>
<td>2.4</td>
<td>Maintain system logs</td>
</tr>
<tr>
<td>2.5</td>
<td>Maintain user accounts</td>
</tr>
<tr>
<td>2.6</td>
<td>HARDWARE PROBLEM RESOLUTION</td>
</tr>
<tr>
<td>3.0</td>
<td>Report problem and assist with defining problem</td>
</tr>
<tr>
<td>3.1</td>
<td>Troubleshoot problem to diagnose if it is software-related or hardware-related</td>
</tr>
<tr>
<td>3.2</td>
<td>Identify failed component, Replace failed components in online system using parts from spares inventory</td>
</tr>
<tr>
<td>3.3</td>
<td>Restore operation of repaired/replaced equipment</td>
</tr>
<tr>
<td></td>
<td>HARDWARE SPARE PARTS</td>
</tr>
<tr>
<td>4.0</td>
<td>Manage local spares inventory</td>
</tr>
<tr>
<td>4.1</td>
<td>Provide appropriate facility for local storage of spares</td>
</tr>
<tr>
<td>4.2</td>
<td>Replenish local spares inventory</td>
</tr>
<tr>
<td>4.3</td>
<td>Integration and database work</td>
</tr>
<tr>
<td>4.4</td>
<td>FEP Card addition/Expansion</td>
</tr>
<tr>
<td>5.0</td>
<td>Database resizing</td>
</tr>
<tr>
<td>5.1</td>
<td>Other requirements</td>
</tr>
</tbody>
</table>

For the maintenance phase, selected bidder to dedicatedly post complete project management team comprising 01 Project manager (B. Tech / B. E. with at-least 8-10 years relevant experience in Smart Grid/ Smart Meter/ AMI/AMR) and 05 support engineers (Diploma/Degree with at-least 5 years relevant experience) per site office for resolving field related matters for application management and overall system maintenance.

User Acceptance Testing and Sign-Off from JKPDD would require for declaration of Go-Live. RECPDCL will provide necessary support for coordination with JKPDD.

Bidders to provide complete year wise plan for resource deployment post implementation phase.

Selected Bidder to setup a Project Management Office within 30 days from the date of award of contract. This office shall remain operational till the successful completion of this project i.e. Implementation stage (36 Months), Warranty & O&M Stage (60 months post implementation and Go-live).

Packaging and transportation from the manufacturer’s work to the site including ports and customs clearance will be borne by the bidder.

Insurance of all equipment from manufacturer’s site till installation, commissioning, handing over and user acceptance will be borne by the bidder.

Maintain the mandatory and recommended spares during warranty and O&M period and provide the list of the same. On competition of warranty/ O&M period, bidder to hand over all spares to JKPDD in working condition.

Install the equipment, obtain JKPDD acceptance and submit a copy of the same to designated authority of RECPDCL.

Post completion of installation and commissioning works, the selected bidder shall provide a complete and final location table and spreadsheet indicating all locations including all the relevant following information.

The bidder shall make his own necessary arrangements for the following and for those not listed anywhere else:
- Office and store.
- Transportation.
- Boarding & lodging arrangement for their personnel.

- Technical Specifications of various type AMI equipment, Hardware & Software shall have full compliance with NSGM, CEA, BIS, MoP guidelines and latest applicable amendment. However, any higher specifications are acceptable in case of any technical specification has become obsolete.

- **Software Solution:**

  Software should provide following unique features:

  (i) Collects, archives and analyses collected parameter from all sites.
  (ii) Multiple users are able to view the data in required formats for graphs, trends, tables and reports. This enables better monitoring and control of transformers.
  (iii) Can be customized based on number of AMI installed and number of user clients.
  (iv) Each user can be assigned individual passwords and rights.
  (v) Graphic user interface.
  (vi) View all parameters and reports via web clients.
  (vii) Alarms and events
  (viii) Required reports can be configured by the user.
  (ix) Send alarm messages via e-mails to pre-defined users in case on events.
  (x) Send reports to pre-defined user at set intervals.
  (xi) Results in saving capital equipment by early detection of expected faults.
  (xii) Detect energy loss based on energy through DT and actual energy billed.
  (xiii) Shows Vector Diagram
  (xiv) Meter Data in different GUIs.
  (xv) User defined GUI reports should be there.

- **Special Tools and Accessories**

  (i) The bidder’s proposal shall include the list of special tools, testing equipment and accessories required during development stage, for day to day operation and maintenance of the system.
  (ii) The bidder should clearly bring out the list of such tools in their technical proposal. However, the prices of these special tools shall be included in the related equipment price in the price template given in this RFP.

- **Testing, Commission and Successful Operation**

  (i) Post FMS, the bidder shall provide support to fix any bug related to implementation. Utility will run the system after successful handover of the system to utility by bidder and it shall run without any bug for at least 3 months after warranty period.
  (ii) Demonstration of all the features of latest version of software; Acceptance testing of the system thus implemented to the owner’s satisfaction.
  (iii) The scope includes testing and commissioning & implementation of all equipment, sub-systems and systems of the project and putting them into successful technical & commercial operation. The scope shall include but not limited to the requirements given elsewhere in the specification. The bidder shall be responsible to provide all necessary testing and commissioning personnel, tools/kits, test equipment etc.

**15. Training and Capacity Building Requirements**

AMI Implementing Agency shall provide training sessions to officers identified by JKPDD on the following domains (including, but not limited to):
The primary objective of the trainings is to achieve 100% user adoption through technical and behavioural competencies. Each training session mentioned above, shall be for 2 days (encompassing 8 working hours per day) and shall be conducted in English language. The AMI Implementing Agency shall provide a training plan (including training curriculum and calendar) so that there is a proper transfer of knowledge about the deployed systems to DISCOM officers. The training shall cover technical, functional aspects.

The AMI Implementing Agency is expected to complete / be involved in the following activities but not limited to:

- The AMI Implementing Agency shall conduct a training need analysis to identify the training requirements of the user group to identify the criteria for training, plans and responsibilities of the target stakeholders and knowledge sharing strategy.
- Testing scripts shall be prepared to test the business processes and scenarios of the new system. The project team members will further develop these testing scripts into training documents.
- The training has to be conducted at the training facilities of DISCOMs or at training facility of OEM/AMI Implementing Agency as per the Software product's proposed in the solution by the AMI Implementing Agency. The training has to be conducted by Instructors of AMI Implementing Agency and OEM. All costs related to the logistics and contents of the training shall be borne by the AMI Implementing Agency irrespective of the location of the training.
- The training and delivery options shall be on-line as well as off line (as recommended by JKPDD), CBTs, and instructor led class rooms. The trainings shall be interactive and ensure optimum knowledge transfer hence the trainings shall mandatorily be given in pre-production or live environment and not in the form of presentations etc. Training material will be organised by functional process that will serve as the training documentation for a particular functional area.
- The participants of DISCOMs will be issued a certificate from OEM and AMI Implementing Agency for attending these courses.
- The AMI Implementing Agency shall obtain a certificate of completion after each training workshop.
- The AMI Implementing Agency shall provide associated documentation for all deployed systems to ensure a smooth transition from deployment to post-deployment operations and maintenance of the system.
- The AMI Implementing Agency shall ensure that the trainers conducting the training shall have a minimum of 5 years of experience in the domain in which he/she is conducting the training. The AMI Implementing Agency shall provide CVs of the proposed trainers.

**15.1 Training Programs**

The implementation partner shall conduct the following training for employees of DISCOM:

**15.1.1 Professional Training**

This is the training for the core group of implementation team of the DISCOM. The DISCOM’s team will comprise of members from all the Business Functions and affected by the AMI implementation. Each member would be trained in the relevant function / module. This Training would be required to be given to at least 9-12 personnel of Owner. It is the responsibility of AMI Implementing Agency to deliver this training. Standard curriculum, designed and agreed by the DISCOM for hardware, software and network preferably from the OEM partner or OEM’s certified training partner shall be arranged for each group. The DISCOM will prefer if a portion of the training is conducted on-site.

**15.1.2 End User Training**

The AMI Implementing Agency will provide training to an owner’s team on a "Train the Trainer" basis. The Owner’s team so trained will then train all of the owner’s end users. It is estimated that this training will
require for divisions (approximately 75 nos.), with each group comprising of around 5 to 10 persons. These training sessions will be required to be conducted at any of the sites.

15.1.3 Train-The-Trainer Program

Development and delivery of a Train-the-Trainer program to prepare Organization or the delivery of the training program. This program will include:

- Training the DISCOMs instructors on the customized version of the application’s as it would be trained to an end-user, allowing the training team to model our approach.
- Opportunity for knowledge sharing in the areas of leading practice, concepts, new business processes and knowledge to the DISCOMs instructors.
- Sharing of leading practices on creating an effective classroom and an appropriate learning environment.
- Sharing of leading practices on classroom communication to enable the DISCOMs instructors to encourage student involvement and student interaction. The program includes instruction on nonverbal behaviour, listening skills, questioning techniques, how to manage difficult behaviours, interpreting body language, and general presentation tips.
- Training shall be provided to the DISCOM instructors on the customized version of the application as it would be trained to the end user.
- Each workshop shall contain at least 20 people. The workshop shall be conducted in at least 2 batches.

15.1.4 Content Development

Development of customized, modular training materials based upon user roles and business process, and customized application. OEM consultants along with System Integrator will work together with DISCOMs resources to enable transfer of knowledge. The following materials will be developed:

- Paper-based classroom participant guides for each identified user group. These guides include hands-on exercises and are based upon ‘Day in the Life’ scenarios.
- Paper-based classroom instructor guides including instructor notes with additional background information and points to be highlight during the training.
- Media-based training simulations for pre-class preparation, in-class practicing and knowledge and skills validation.
- Assist the DISCOM team members in creating procedure documents for use in conjunction with the other training material. A procedure document will list all of the transactions necessary to complete a business scenario whereas a training document lists the steps to execute a transaction. Each step will be a transaction referenced in a training document. Procedures will be listed for all the online steps needed to complete a scenario. In addition to functional training document binders and procedures, the project team members will create training courses and exercises. The training courses will contain all the training documents and necessary to train an end-user in his / her role. The training exercises will list common business scenarios and input data that the user will enter to practice with the newly developed BPA software.

All the training material in hard copy soft copy including audio visual content which includes recording of the training delivered shall be handed over to the DISCOMs and considered DISCOMs’ property.

Following stages shall be considered while planning training for the participants from the DISCOMs.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Training</th>
<th>Team</th>
<th>Module</th>
<th>Stage</th>
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<tr>
<td>1.</td>
<td>Professional Training</td>
<td>Core Team Members</td>
<td>As per the solution proposed by the AMI Implementing Agency, the training for products from OEM</td>
<td>Before implementation Continuous Training(fortnightly) during implementation Handholding ”Go Live” stage</td>
</tr>
<tr>
<td>2.</td>
<td>End user Training</td>
<td>All user group</td>
<td>As per the solution proposed by the AMI Implementing Agency, the training for products from OEM</td>
<td>Before implementation Continuous Training(fortnightly) during implementation Handholding ”Go Live” stage</td>
</tr>
</tbody>
</table>
16. Post Implementation Support & Warranty Requirements

- The Contractor warrants that all the Goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.
- The Contractor further warrants that the Goods shall be free from defects arising from any act or omission of the Contractor or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.
- The complete cover warranty shall remain valid for the period of 5 years after operational acceptance and Go-Live of the complete AMI system by RECPDCL.
- The Maintenance of the system supplied & installed by the Contractor shall be comprehensive. The Contractor shall be responsible for providing all the spare (cards/modules/accessories etc.) for supplied & installed equipment. The spares shall be provided/arranged by the contractor at no extra cost to Employer. For early restoration during the emergency condition, if spares are made available by Employer, the same shall have to be replenished by the Contractor within thirty (30) days.
- Warranty of Hardware/software/Communication infra which include bug fixing, patches, replace, upgrade etc. and same shall be provided.
- Trouble shooting of AMI Hardware/Software.
- Maintenance of system and application response time.
- System and database administration
- Existing Application maintenance, correction, enhancement, new development, bug fixing etc.
- Maintenance, modification, enhancement and new integrated business processes.
- Post implementation support and management shall be governed by performance parameters as mentioned in this NIT.
- Post implementation shall also cover the new requirement of tools, application, reports etc. of utility.
- The bidder shall provide the off-site support of experts also to resolve the issues in shortest time.
## 1. AMI BOQ

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
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<td>A</td>
<td><strong>Meter Supply, Installation, Commissioning &amp; other services</strong></td>
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<tr>
<td>1.</td>
<td>Single phase whole current Smart Meter 5-30A with provision of RF/GPRS/3G/4G Communication Module along with associated Power Supply as per specifications (Subject to maximum of 10% allowed on GPRS after Approval of Employer)</td>
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<tr>
<td>1A</td>
<td>Single phase whole current Smart Meter 10-60A with provision of RF/GPRS/3G/4G Communication Module along with associated Power Supply as per specifications (Subject to maximum of 10% allowed on GPRS after Approval of Employer)</td>
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<tr>
<td>2.</td>
<td>Three Phase whole current Smart Meter 20-100A RF/GPRS/3G/4G Communication Module and associated Power Supply as per specifications (Subject to maximum of 10% allowed on GPRS after Approval of Employer)</td>
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<tr>
<td>2A</td>
<td>Common Meter Reading Instrument/Tablet compatible with all type of Smart Meters with all desired communication facilities to enable downloading of parameters from Meters on Pole through wireless communication along with accessories</td>
<td>Nos.</td>
<td>500</td>
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<td><strong>Sub Total (A)</strong></td>
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<tr>
<td>B</td>
<td><strong>Meter Box Supply, Installation, Commissioning &amp; other services</strong></td>
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<td></td>
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<tr>
<td>3.</td>
<td>Meter Box (1:1) along with mounting clamps, nuts &amp; bolts for 1-Ph Meter</td>
<td>Nos.</td>
<td>117938</td>
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<tr>
<td>4.</td>
<td>Meter Box (2:1) with Bus Bars, internal wiring of appropriate current rating &amp; connections along with mounting clamps, nuts &amp; bolts for 1-Ph Meter</td>
<td>Nos.</td>
<td>98281</td>
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<tr>
<td>5.</td>
<td>Meter Box (4:1) with Bus Bars, internal wiring of appropriate current rating &amp; connections along with mounting clamps, nuts &amp; bolts for 1-Ph Meter</td>
<td>Nos.</td>
<td>117938</td>
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<tr>
<td>6.</td>
<td>Meter Box (1:1) along with mounting clamps, nuts &amp; bolts for 3-Ph Meter</td>
<td>Nos.</td>
<td>138750</td>
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<td>7.</td>
<td>Polycarbonate Seals for Meter Box as per Specifications</td>
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<td>3052500</td>
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<td><strong>Sub Total (B)</strong></td>
<td></td>
<td></td>
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<tr>
<td>C</td>
<td><strong>Service Cable Supply, Installation, Commissioning &amp; other services</strong></td>
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<td></td>
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<tr>
<td>8.</td>
<td>2C x 25 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from LT ABC/Conductor to Single phase Meter Box (1:1) (Supply &amp; Installation O/H) including all Terminations</td>
<td>Mtrs</td>
<td>353813</td>
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<tr>
<td>8A.</td>
<td>2C x 25 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from LT ABC/Conductor to Single phase Meter Box (2:1) (Supply &amp; Installation O/H) including all Terminations</td>
<td>Mtrs</td>
<td>294844</td>
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<td>9.</td>
<td>2C x 35 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from LT ABC/Conductor to Single phase Meter Box (4:1) (Supply &amp; Installation O/H) including all Terminations</td>
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<td>10.</td>
<td>4C x 16 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from LT ABC/Conductor to Three phase Meter Box (1:1) (Supply &amp; Installation O/H) including all Terminations</td>
<td>Mtrs</td>
<td>374625</td>
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<td>11.</td>
<td>4C x 25 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from LT ABC/Conductor to Three phase Meter Box (1:1) (Supply &amp; Installation O/H) including all Terminations</td>
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<td>41625</td>
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<tr>
<td>12.</td>
<td>2C x 10 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from Single phase Meter Box (1:1, 2:1 &amp; 4:1) to Consumer Premises (Supply &amp; Installation) including all Terminations</td>
<td>Mtrs</td>
<td>943500</td>
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<td>13.</td>
<td>2C x 16 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from Single phase Meter Box (1:1, 2:1 &amp; 4:1) to Consumer Premises (Supply &amp; Installation) including all Terminations</td>
<td>Mtrs</td>
<td>3302250</td>
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<td>14.</td>
<td>2C x 25 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from Single phase Meter Box (1:1, 2:1 &amp; 4:1) to Consumer Premises (Supply &amp; Installation) including all Terminations</td>
<td>Mtrs</td>
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<td>15.</td>
<td>4C x 16 sq.mm. Aluminium FRLS LT XLPE unarmoured Cable from Three phase Meter Box (1:1) to Consumer Premises (Supply &amp; Installation) including all Terminations</td>
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<td></td>
<td>Description</td>
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<td>Cost</td>
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<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
<td>-------</td>
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<tr>
<td>16</td>
<td>4C x 25 sq.mm. Aluminium LT XLPE unarmoured Cable from Three phase Meter Box (1:1) to Consumer Premises (Supply &amp; Installation) including all Terminations</td>
<td>Mtrs</td>
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<tr>
<td>17</td>
<td>Service main clamps for supporting service cable</td>
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<td>1850000</td>
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<tr>
<td>18</td>
<td>IPC with Aluminium Alloy connector for 1 phase meters connection from LT ABC</td>
<td>Nos.</td>
<td>467819</td>
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<td>19</td>
<td>IPC with Aluminium Alloy connector for 3 phase meters connection from LT ABC</td>
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<td>388500</td>
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<td>Mini Wedge Connector Suitable for Termination of Cable from Bare O/H Conductor to Meter Box</td>
<td>Nos.</td>
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<td>21</td>
<td>Mini Wedge Connector Suitable for Termination of Cable from Bare O/H Conductor to Meter Box</td>
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<td><strong>Network Equipments Supply, Installation, Commissioning &amp; other services</strong></td>
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<tr>
<td>22</td>
<td>DCU, Field Router, Collector and other associated Network Components required for Communication from Meter along with Installation Clamp, cabling and Accessories for project Area</td>
<td>Lot 1</td>
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<td>23</td>
<td>Network Interface Card (NIC) for Meters including 30% GPRS NIC Cards</td>
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<td><strong>Dismantling Services</strong></td>
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<td>24</td>
<td>Removal of Single Phase old Meter &amp; Return Back to JKPDD Store along with Removed Accessories</td>
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<td>25</td>
<td>Removal of Three Phase old Meter &amp; Return Back to JKPDD Store along with Removed Accessories</td>
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<td>Removal of 2 Core cable/Wires &amp; Return Back to JKPDD Store along with Removed Accessories</td>
<td>Mtrs</td>
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<td>27</td>
<td>Removal of 4 Core Cable/Wires &amp; Return Back to JKPDD Store along with Removed Accessories</td>
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<td><strong>Sub Total (E)</strong></td>
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<td>28</td>
<td>Miscellaneous item, if any</td>
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<td></td>
<td><strong>Total cost of AMI Meters+DCU</strong></td>
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Annexure-A to
VOLUME – I : Section-VII

General Technical Instructions

(This document is meant for the exclusive purpose of bidding against this Package and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued.)

(Applicable practices as required for successful Implementation of AMI Project to be referred from this document)
Technical Specification IPDS

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General Technical Instructions

3.1 Standards and Regulations: Following CEA regulations shall be applicable during execution of work in additional to Jammu & Kashmir Electricity Act 2010:

a. Construction Regulation – Central Electricity Authority (Technical Standards for construction of electrical plants and electric lines) Regulation, 2010 (as amended time to time) or equivalent act of J&K

b. Safety Regulation for construction and O&M - Central Electricity Authority (Safety requirements for construction, Operation and Maintenance of electrical plants and electric lines) Regulation, 2011 (as amended time to time) or equivalent act of J&K

c. Connectivity Regulation – Technical Standard for connectivity to the grid (Amendment) Regulation 2013; Technical Standards for connectivity of the Distributed Generation resources, 2013; Central Electricity Authority (Grid Standard) Regulation, 2010 (as amended time to time) or equivalent act of J&K

d. Metering Regulations – Central Electricity Authority (Installation and Operation of meters) Regulations, 2006; Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations, 2010 and 2015 (as amended time to time) or equivalent act of J&K

e. Central Electricity Authority (Measures relating to safety and Electric supply regulations), 2010 and amendment regulation 2015 (as amended time to time) or equivalent act of J&K


1.1 33 KV Line support

1.1.1. 11 Mtr. Long Steel Tubular Poles hall be used for 33 KV line support). 152x152mm H-Beam (37.1kg/m)\(^1\) can also be used as support in urban/forest area and or Steel Tubular Poles may be used in hilly area where head load shifting is the only option. Cement concreting shall be used for 33 KV support foundations in mixture 1:2:4 (1: cement, 2: coarse sand and 4 Stone ballast 40mm sizes). Each support shall be concrete (0.5mx0.5mx2m) = 0.5 cmt. 0.014 cmt shall also be used in muffing of the support. PCC pole shall not be provided with muffing.

1.1.2. Pole base plates as per specifications shall be used.

1.1.3. Pole earthing shall be performed through earthing coil duly connected with 8 SWG wire. The GI wires between pole structure and the earthing coil should not be used in cut length. Wherever, cut is evitable, proper nut bolt, washer and binding should be made as per REC specifications. The GI wire between support and earth coil should be placed 1 meter below the ground level.

1.1.4. Earth coil should be inserted 1200 mm away from pole.

\(^1\) In hilly and difficult terrain, steel tubular support may be accepted, they shall be concreted as per speculations,
1.2 11 KV line Support and DTR Substation support

1.2.1. 8.0 meters or equivalent PCC Poles\(^2\) as per prevailing practices of the state shall be used for 11 KV line and substation support. 152x152mm H-Beam (37.1kg/m)\(^3\) can also be used as support in urban/forest area and or Steel Tubular Poles may be used in hilly area where head load shifting is the only option.

The single PCC pole supports shall be erected with Stone bolder/stone ballast mixed with excavated earth in normal soil. PCC poles in Double Pole structures, turning point structure, Distribution Transformer Substation structure shall be grouted in cement concrete mixture of 1:2:4(1: cement, 2: coarse sand and 4 Stone ballast 40mm sizes). Single pole supports in water logging area shall also be grouted in cement concrete mixture of 1:2:4(1: cement, 2: coarse sand and 4 Stone ballast 40mm sizes). PCC pole shall be grouted with concrete (0.6mx0.6mx1.35m) = 0.486 cmt. In special location, wherever, Project Manager specifically decides, to enhance additional strength, concreting may be used as support foundation.

In forest, wherever special care is to be made for elephant corridors, 13m long, 152x152mm RS Joist (37.1kg/m) may be used for 11 KV line support.

152x152mm H-Beam (37.1kg/m)\(^4\) and Steel Tubular Poles shall be grouted in cement concrete mixture of 1:2:4(1: cement, 2: coarse sand and 4 Stone ballast 40mm sizes) in all the formation.

1.2.2. Pole base plates as per specifications shall be used.

1.2.3. Pole earthing shall be performed through earthing coil duly connected with 8 SWG wire. The GI wires between pole structure and the earthing coil should not be used in cut length. Wherever, cut is evitable, proper nut bolt, washer and binding should be made as per REC specifications. The GI wire between support and earth coil should be placed 1 meter below the ground level.

1.2.4. Earth coil should be inserted 1200 mm away from pole.

1.3 Route And Terrain

1.3.1. The scope of HT/LT length of feeder are enclosed with the tender documents. On award of the contract, contractor shall perform foot survey to access the route, pole location and thus Single Line Diagram of the line works. The survey shall be approved by Project Manager. Accordingly requirements of materials shall be finalized by the turnkey contractor in association with Project Manager.

1.4 Detailed Survey

1.4.1. The detailed survey shall be carried out for the approved feeders/spur lines by the contractor and submitted for owner approval.

\(^2\) In hilly and difficult terrain, steel tubular support may be accepted, they shall be concreted as per speculations,

\(^3\) In hilly and difficult terrain, steel tubular support may be accepted, they shall be concreted as per speculations,

\(^4\) In hilly and difficult terrain, steel tubular support may be accepted, they shall be concreted as per speculations,
1.5 **Profile Plotting**

1.5.1. **Span:** The number of consecutive spans between the section points shall not exceed design length considering wind pressure, type of poles and size of conductor.

1.5.2. **Extension:** An individual span shall be as near to the normal design span as possible. In case an individual span becomes too short with normal supports on account of undulation in ground profile, one or both the supports of the span may be extended by inserting standard body extension designed for the purpose according to technical specification.

1.5.3. **Loading:** There shall not be any upward force on poles under normal working conditions and the suspension poles shall support at least the minimum weight span as provided in the design. In case uplift is unavoidable, it shall be examined if the same can be overcome by adding standard body extensions to the poles failing which tension poles designed for the purpose shall be employed at such positions.

1.5.4. **Horizontal Tensions on pin insulators are to be avoided by proper alignment of the line. In case where installation of DP structure is not possible to erect for turning the line, “two pins” arrangement with suitable jumpering shall be provided at all those locations where pins are subjected to horizontal tension. Bridling type V Cross arms for such installations shall be used by the agency accordingly.

1.6 **Road Crossing**

At all road crossings, the poles shall be fitted with horizontally aligned disc type tension insulator string(s) or bridling V-cross arm supports using double pin insulator per phase depending on the type of poles and line but the ground clearance at the roads under maximum temperature and in still air shall be such that it should not fall below 6.1m in case of 33 KV and 11 KV lines. Also, cradle guarding is to be used at all the road crossing locations as per drawings / specifications enclosed.

1.7 **Railways Crossings**

Railway Crossings at pre-planned locality shall be selected in such a way that minimum feeder length shall be re-routed. The line crossing should be executed as per prevailing practices and approved drawings of railways. Railways crossing shall preferably be executed through underground cabling. Horizontal drill machine shall be used for this purpose. Required permission to block the Railways traffic and approval for railway crossing shall be arranged by the owner at his own cost. All liaison works shall be performed by turnkey contractor.

1.8 **Telecommunication, LT or HT Line Crossing**

The angle of crossing shall be as near 90 degrees as possible. However, deviation to the extent of 30 degree may be permitted under exceptionally difficult situations. Cradle guarding is to be used at all such crossing locations as per drawings / specifications enclosed.

1.9 **Details En-route**

All topographical details, permanent features, such as well, trees, building etc. 75 m on either side of the alignment shall be detailed on the profile plan.
1.10 Clearances - General

For the purpose of computing the vertical clearance of an over-head line, the maximum sag of any conductor shall be calculated on the basis of the maximum sag in still air and the maximum design temperature. Similarly, for the purpose of computing any horizontal clearance of an over-head line, the maximum deflection of any conductor shall be calculated on the basis of the wind pressure specified by the State Government under rule 76 (2) (a) [or may be taken as 35º, whichever is greater]. Following clearances shall be maintained by the contractor while executing the work:

1.10.1. CLEARANCE ABOVE GROUND OF THE LOWEST CONDUCTOR: No conductor of an over-head line, including service lines, erected across a street shall at any part thereof be at a height less than

(a) For low and medium voltage lines 5.8 metres
(b) For high voltage lines 6.1 metres

1.10.2. No conductor of an over-head line, including service, lines, erected along any street shall at any part thereof be at a height less than

\[
\begin{array}{|c|}
\hline
| a. | For low, medium and high voltage lines upto and including 11,000 volts, if bare | 4.6 metres |
| b. | For low, medium and high voltage lines upto and including 11,000 volts, if insulated | 4.0 metres |
| c. | For high voltage lines above 11,000 volts | 5.2 metres |
\hline
\end{array}
\]

For extra-high voltage lines the clearance above ground shall not be less than 5.2 meters plus 0.3 meter for every 33,000 volts or part thereof by which the voltage of the line exceeds 33,000 volts:

Provided that the minimum clearance along or across any street shall not be less than 6.1 meters.

1.10.3. CLEARANCE FROM BUILDINGS OF LOW AND MEDIUM VOLTAGE LINES AND SERVICE LINES:

Where line is to cross over another line of the same voltage or lower voltage, pole with suitable extensions shall be used. Provisions to prevent the possibility of its coming into contact with other overhead lines shall be made in accordance with the latest CEA regulations (as amended from time to time). The contractor will required to under cross higher voltage lines by erecting gantries/suitable Rail Pole structures.

Where a low or medium voltage over-head line passes above or adjacent to or terminates on any building, the following minimum clearances from any accessible point, on the basis of maximum sag, shall be observed:

a) For any flat roof, open balcony, verandah roof and lean-to-roof

   i. When the line passes above the building a vertical clearance of 2.5 meters from the highest point; and
   ii. When the line passes adjacent to the building a horizontal clearance of 1.2 meters from the nearest point, and
b) For pitched roof

   i. When the line passes above the building a vertical clearance of 2.5 meters immediately under the lines, and
   ii. When the line passes adjacent to the building a horizontal clearance of 1.2 meters.

The horizontal clearance shall be measured when the line is at a maximum deflection from the vertical due to wind pressure.

1.10.4. CLEARANCE FROM BUILDINGS OF HIGH AND EXTRA-HIGH VOLTAGE LINES:

Where a high or extra-high voltage over-head line passes above or adjacent to any building or part of building it shall have on the basis of maximum sag a vertical clearance above the highest part of a building immediately under such line, of not less than

<table>
<thead>
<tr>
<th>(a)</th>
<th>For High Voltage Lines up to and including 33,000 volts</th>
<th>3.7 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>For Extra High Voltage Lines</td>
<td>3.7 m plus 0.3 m for every additional 33 KV or part thereof.</td>
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1.11 Electrical System Data

<table>
<thead>
<tr>
<th>Voltage</th>
<th>33 kV</th>
<th>11 kV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>33 kV</td>
<td>11 kV</td>
</tr>
<tr>
<td>Maximum system voltage</td>
<td>36 kV</td>
<td>12 kV</td>
</tr>
<tr>
<td>BIL (Impulse)</td>
<td>170 kVp</td>
<td>75 kV</td>
</tr>
<tr>
<td>Power frequency withstand voltage (wet)</td>
<td>75 kV (rms)</td>
<td>28 kV</td>
</tr>
<tr>
<td>Minimum corona extinction voltage for phase to earth</td>
<td>Not less than 27 kV, 50 Hz ac system under Dry condition (rms)</td>
<td></td>
</tr>
<tr>
<td>Radio interference voltage at one MHz for 27 kV (dry condition)</td>
<td>Not exceeding 1000 micro-volts</td>
<td></td>
</tr>
</tbody>
</table>

1.12 Pole Location

In locating poles on lines, the following general principles should be kept in mind:

1. Keep spans uniform in length as far as possible.
2. Locate to give horizontal grade.
3. By locating the poles on high places short poles can be used and will maintain proper ground clearance at the middle of the span. In extremely hilly or mountainous country, poles are located on ridges there by greatly increasing the spans without greatly increasing the pull on the conductor. This is possible because the sag can be made very large and will maintain the required ground clearance. Special attention should be given to the locations of poles, where the ground washes badly. Poles should not be placed along the edges of cuts at or embankment or along the banks of creeks of streams.

1.13 Construction

The construction of overhead-lines may be divided into the following parts:

1. Pit marking, pit digging.
2. Erection of supports and concreting.
(3) Providing of guys to supports.
(4) Mounting cross-arms, pin and insulators, and pin binding.
(5) Paying and stringing of the conductor.
(6) Sagging and Tensioning of Conductors.
(7) Crossings.
(8) Guarding.
(9) Earthing.
(10) Testing and Commissioning.

1.14 Erection of DP Structure for Angle Locations

For angles of deviations more than 10 degree, DP structure may be erected. The pit digging should be done along the bisection of angle of deviation.

After the poles are erected, the horizontal/cross bracings should be fitted and the supports held in a vertical position with the help of temporary guys of Manila rope 20/25 mm dia.

Wherever space is not found sufficient to install double Pole structure, single pole cut point may be installed. The support so erected must be grouted.

1.15 Concreting

The concreting mixture of one cum 1:2:4 ratios would mean 1 part cement, 3 parts coarse sand and 6 part 40 mm aggregate size stones. It may be noted that while preparing the concrete mixture, large quantities of water should not be used as this would wash away cement and sand.

1.16 Providing Of Guys To Supports

Guys are installed at locations where terminal poles are erected at sectional cut points. These cut points may be in same alignment or at turn points. Guys are installed to nullify tension on supports resulted due to conductors tension. In spite of careful planning and alignment of line route, certain situations arise where the conductor tries to tilt the pole from its normal position due to abnormal wind pressure and deviation of alignment, etc. When these cases of strain arise, the pole is strengthened and kept in position by guys. One or more guys will have to be provided for all supports where there is unbalanced strain acting on the support, which may result in tilting/uprooting or breaking of the support.

Guys are braces fastened to the pole. In this work anchor type guy sets are to be used. These guys are provided at (i) angle locations (ii) dead end locations (iii) T-off points (iv) Steep gradient locations and (v) where the wind pressure is more than 50 kg / Sq.m.

The fixing of guys stays will involve (i) pit digging and fixing stay rod (ii) fastening guy wire to the support (iii) Tightening guy wire and fastening to the anchor. The marking of guy pit, digging and setting of anchor rod must be carefully carried out. The stay rod should be placed in a position so that the angle of rod with the vertical face of the pit is 30º/45º as the case may be.

Before start of erection of Stay sets, required concreting materials like Cement, Sand, Stone Chips and Construction water need to be made available near the pit.

G.I. stay wires of size 7/3.15 mm (10 SWG) & 7/4.00 mm (8 SWG), for 16 mm/20 mm stay rods respectively, are to be provided. 8.5 Kg. Stay Wire (7/4.00 mm) per Stay with 20 mm Stay rod for 33 KV line and 5.5 Kg. Stay Wire (7/3.15 mm) per Stay with 16 mm
Stay rod for 11 KV lines are to be used. For double pole structure (DP), four stays along the line, two in each direction and two stays along the bisection of the angle of deviation (or more) as required depending on the angle of deviation are to be provided. Hot dip galvanized stay sets are to be used. One stay to counter the angular deformation force shall be used.

After concreting, back filling and ramming must be done well and allowed 7 days to set. The free end of the guy wire/stay wire is passed through the eye of the anchor rod, bent back parallel to the main portion of the stay/guy and bound after inserting the G.I. thimble, where it bears on the anchor rod. If the guy wire proves to be hazardous, it should be protected with suitable asbestos pipe filled with concrete of about 2 m length above the ground level, painted with white and black strips so that, it may be visible at night. The turn buckle shall be mounted at the pole end of the stay and guy wire so fixed that the turn buckle is half way in the working position, thus giving the maximum movement for tightening or loosening.

1.17 Guy Strain Insulators

Guy insulators are placed to prevent the lower part of the Guy from becoming electrically energized by a contact of the upper part of the guy when the conductor snaps and falls on them or due to leakage. No guy insulator shall be located less than 2.6 m from the ground. Guy insulators are to be used in stay wires only. All stay conductors are to be provided with guy insulators as per following specifications.

<table>
<thead>
<tr>
<th>Line Conductor</th>
<th>Guy Insulator Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 KV line stay</td>
<td>Type C guy insulator (1 No)</td>
</tr>
<tr>
<td>33 KV line stay</td>
<td>Type C guy insulators (2 Nos)</td>
</tr>
</tbody>
</table>

1.18 Fixing Of Cross-Arms

After the erection of supports and providing guys, the cross-arms are to be mounted on the support with necessary clamps, bolts and nuts. The practice of fixing the cross arms before the pole erection is also there. In case, the cross-arm is to be mounted after the pole is erected, the lineman should climb the pole with necessary tools. The cross-arm is then tied to a hand line and pulled up by the ground man through a pulley, till the cross-arm reaches the line man. The ground man should station himself on one side, so that if any material drops from the top of the pole, it may not strike him. All the materials should be lifted or lowered through the hand line, and should not be dropped.

1.19 Insulators And Bindings

Line conductors are electrically insulated from each other as well as from the pole by ‘Insulators’. Following two type of insulators shall be used for the line insulation:

1. Pin type
2. Strain type

The pin type insulators will be used for straight stretch of line. The insulator and its pin should be mechanically strong enough to withstand the resultant force due to combined effect of wind pressure and weight of the conductor in the span.

The strain insulators are intended for use at terminal locations or dead end locations and where the angle of deviation of line is more than 10°. Strain insulators are also intending to use at major road crossing locations.

The pins for insulators are fixed in the holes provided in the cross-arms and the pole top brackets. The insulators are mounted in their places over the pins and tightened. In the case of strain or angle supports, where strain fittings are provided for this purpose, one
strap of the strain fittings is placed over the cross-arm before placing the bolt in the hole of cross-arms. The nut of the straps is so tightened that the strap can move freely in horizontal direction.

All HT/LT insulators shall be tested for insulation tests before installation on line. They shall be dipped into water for 24 hrs and then tested for insulation resistance tests at the stores. The insulators found fit in IR testing shall be sent to site for erection. 11KV na d33 KV insulators shall be tested by at-least 1 KV megger whereas LT insulators shall be tested by 500 Volts megger.

1.20 **Conductor Erection**

The main operations are:-

(a) Transportation of Conductor to works site.
(b) Paying and Stringing of Conductor
(c) Jointing of Conductor
(d) Tensioning and Sagging of Conductor

While transporting conductors drums to site, precautions are to be taken so that the conductor does not get damaged/injured. The drum could be mounted on cable drum support, which generally is made from crow-bar and wooden slippers for small size conductor drums. The direction of rotation of the drum has to be according to the mark in the drum so that the conductor could be drawn. While drawing the conductor, it should not rub causing damage. The conductor could be passed over poles on wooden or aluminum snatch block (pulley) mounted on the poles for this purpose.

When approaching the end of a drum length at least three coils shall be left in place when the stringing operations are stopped. These coils are to be removed carefully and if another length is required to be run out a joint shall be made as per the recommendations of the accessories manufacturer.

The mid span jointing is done through compressions or if helical fittings are used the jointing could be done manually. After completing the jointing, tensioning operation could be commenced. The conductor is pulled through come-along clamps to stringing the conductor between the tension locations.

Conductor splices shall not crack or otherwise be susceptible to damage in the stringing operation. The Contractor shall use only such equipment / methods during conductor stringing which ensures complete compliance in this regard.

All the joints on the conductor and earth-wire shall be of the compression type, in accordance with the recommendations of the manufacturer, for which all necessary tools and equipment like compressors, dies, etc., shall be obtained by the Contractor. Each part of the joint shall be cleaned by wire brush till it is free of rust or dirt, etc., and be properly greased with anti-corrosive compound. If required and as recommended by the manufacturer, before the final compression is carried out with the compressors.

All the joints or splices shall be made at least 15 meters away from the pole. No joints or splices shall be made in spans crossing over main roads, railways and small river spans. Not more than one joint per sub-conductor per span shall be allowed. The compression type fittings shall be of the self-centering type or care shall be taken to mark the conductors to indicate when the fitting is centered properly. During compression or splicing operation, the conductor shall be handled in such a manner as to prevent lateral or vertical bearing against the dies. After compressing the joint, the aluminum sleeve shall have all corners rounded; burrs and sharp edges removed and smoothed.
During stringing of conductor to avoid any damage to the joint, the contractor shall use a suitable protector for mid span compression joints in case they are to be passed over pulley blocks / aerial rollers. The pulley groove size shall be such that the joint along with protection can be passed over it smoothly.

1.21 **Tensioning and Sagging Operations**

The tensioning and sagging shall be done in accordance with the approved stringing charts or sag tables. The "initial" stringing chart shall be used for the conductor and "final" stringing chart for the earth-wire. The conductors shall be pulled up to the desired sag and left in running blocks for at least one hour after which the sag shall be rechecked and adjusted, if necessary, before transferring the conductors from the running blocks to the suspension clamps. The conductor shall be clamped within 36 hours of sagging in.

The sag will be checked in the first and the last section span for sections up to eight spans and in one additional intermediate span for sections with more than eight spans. The sag shall also be checked when the conductors have been drawn up and transferred from running blocks to the insulator clamps.

At sharp vertical angles, conductor and earth-wire sags and tensions shall be checked for equality on both sides of the angle and running block. The suspension insulator assemblies will normally assume verticality when the conductor is clamped.

Tensioning and sagging operations shall be carried out in calm weather when rapid changes in temperature are not likely to occur.

1.22 **Clipping In**

Clipping of the conductors into position shall be done in accordance with the manufacturer’s recommendations. Jumpers at section and angle towers shall be formed to parabolic shape to ensure maximum clearance requirements. Fasteners in all fittings and accessories shall be secured in position. The security clip shall be properly opened and sprung into position.

1.23 **Fixing of Conductors and Earthwire Accessories**

Conductor and earth-wire accessories supplied by the Contractor shall be installed by the Contractor as per the design requirements and manufacturer’s instruction within 24 hours of the conductor / earth-wire clamping. While installing the conductor and earth-wire accessories, proper care shall be taken to ensure that the surfaces are clean and smooth and that no damage occurs to any part of the accessories or of the conductors.

1.24 **Replacement**

If any replacements are to be effected after stringing and tensioning or during maintenance e.g. replacement of cross arms, the conductor shall be suitably tied to the pole at tension points or transferred to suitable roller pulleys at suspension points.

Sagging of conductor has to be in accordance to the Sag Tension chart. In order to achieve it, it is preferred to pull the conductor to a tension a little above the theoretical value so that while transferring it from the snatch blocks to the pit insulators and to take care of temperature variation. Proper sag could achieve. Sagging for 33/11 KV line is mostly done by "Sighting". A horizontal strip of wood is fixed below the cross-arm on the pole at the required sag. The lineman sees from other end and the sag is adjusted by increasing or decreasing the tension. The tension clamps could then be finally fixed and
Conductor be fixed on pin-insulators. All fittings, accessories like guys, cross-arms, etc., could be checked as they should not have de-formalities.

The maximum permissible spans for all the lines of 33/11/0.4 KV are prescribed according to the design of the supports. Sag-tension charts for these conductors are to be followed.

1.25 Tying Of Conductor On Pin Insulators

Conductors should occupy such a position on the insulator as will produce minimum strain on the tie wire. The function of the wire is only to hold the conductor, in place on the insulator, leaving the insulator and pin to take the strain of the conductor.

In straight line, the best practice is to use a top groove insulator. These insulators will carry grooves on the side as well. When the conductor is placed on the top groove, the tie wire serves only to keep the conductor from slipping out.

On corners and angles (below 5 degree deviations) the conductors should be placed on the outside of the insulators. On the far side of the pole, this pulls the conductor against the insulator instead of away from the insulator.

1.26 Kind And Size Of Tie Wire To Be Used

Helically formed fittings are to be used for tying the insulators, end terminal connectors etc.. The tie should always be made of soft annealed wire so that it may not be brittle and injure the line conductor. A tie wire should never be used for second time. Specifications of helically formed fittings are given in this section.

1.27 Rules Of Good Tying Practice

a. Use only helically formed fittings.

b. Use of size of tie wire which can be readily handled yet one which will provide adequate strength.

(c) Use length of tie wire sufficient for making the complete tie, including an allowance for gripping with the hands. The extra length should be cut from each end if the tie is completed.

d. A good tie should

(a) Provide a secure binding between line wire insulator and tie wire.

(b) Have positive contacts between the line wire and the tie wire so as to avoid any chattering of the contacts.

(c) Re-enforce line wire in the vicinity of insulator.

e. Apply without use of pliers.

f. Do not use the wire which has been previously used.

(g) Do not use hard drawn wires for tying.

1.28 Conductors At Different Voltages On Same Supports

In urban area, lines are to be erected with provision for forming lines of two different gradients as under

a) 11 KV Line and LT Lines

b) 33 KV Line and LT Lines

Where conductors forming parts of systems at different voltages are erected on the same supports, the contractor shall make adequate provision to guard against danger to
linesmen and others from the lower voltage system being charged above its normal working voltage by leakage from or contact with the higher voltage system; and the methods of construction and the clearances between the conductors of the two systems shall be as described in the specifications.

The agency shall be intimated by the Project Manager in writing about the locations where such provisions is intended by him. At all such locations, the contractor shall make adequate provision to guard against danger to linesmen and others from the lower voltage system being charged above its normal working voltage by leakage from or contact with the higher voltage system.

1.29 Earthing

Earthing shall generally be carried out in accordance with the requirements of latest CEA regulations (as amended from time to time) and the relevant regulations of the Electricity Supply Authority concerned and as indicated below:

a) All metallic supports shall be earthed.

b) For PCC poles the metal cross-arms and insulator pins shall be bonded and earthed at every pole for HT lines.

c) All special structures on which switches, transformers, fuses, etc., are mounted / likely to mount should be earthed.

d) The supports on either side of the road, railway or river crossing should be earthed.

e) All supports (Steel & PCC) HT lines passing through inhabited areas, road crossings and along such other places, where Earthing of all poles is considered desirable from safety considerations should be earthed.

f) In special locations and special structures, road crossings etc., pipe/rod Earthing should be done on either side of the construction.

g) At other locations the coil Earthing may be adopted. The coil Earthing consists of 10 m length of 8 SWG. G.I. wire compressed into a coil 450 mm length and 50 mm dia and buried 1500 mm deep as per REC standard J-1.

Following shall be the earthing requirements:

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Type of Earthing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Single Pole - PCC/RS Joist/steel tubular</td>
<td>1 No. Coil/Spike Earthing at each SP</td>
</tr>
<tr>
<td>2</td>
<td>Double pole - PCC/RS Joist/steel tubular</td>
<td>2 Nos. Coil/Spike Earthing at each DP</td>
</tr>
<tr>
<td>3</td>
<td>Substation Poles structure - PCC/RS Joist/steel tubular</td>
<td>GI Pipe Earthing 3 Nos</td>
</tr>
<tr>
<td>4</td>
<td>Road crossing</td>
<td>GI Pipe earthing on either side one each</td>
</tr>
<tr>
<td>5</td>
<td>Telephone line crossing</td>
<td>GI Pipe earthing on either side one each</td>
</tr>
<tr>
<td>6</td>
<td>DP with Isolating switch</td>
<td>Coil/Spike earthing 2 Nos and GI Pipe earthing 1 No</td>
</tr>
</tbody>
</table>

1.30 Anti-Climbing Devices

In order to prevent unauthorized persons from climbing any of the supports of HT lines without the aid of a ladder or special appliance, certain anti-climbing devices are provided.
to the supports. Barbed wire binding is to be adopted for this purpose at a distance of 30 to 40 cm at a height of 3.5 to 4 m from ground level. The barbed wire shall conform to IS – 279 (Grade A1). The barbed wired shall be given chromatin dip as per procedure laid down in IS: 1340. At least 3.5 kgs barbed wire is to be used per pole for the purpose.

1.31 Testing And Commissioning

When the line is ready for energisation, it should be thoroughly inspected in respect of the following:-

a) Poles – Proper alignment, concerting and muffing.

b) Cross-arms – Proper alignment.

c) Finishing of fabricated steel items used.

d) Insulators – Proper finish, cleanliness, insulation resistance.

e) Binding, clamps and jumpers – To check whether these are in reach.

f) Conductor and earth wire – Proper sag to check whether there are any cuts, etc.

g) Guys: To check whether the Guy wire is tight and whether the Guy insulators are in tact.

h) Earthing System: To check whether the earthing connections of supports and fittings are intact. Measure earth resistance with earth tester.

After the visual inspection is over and satisfied, the conductor is tested for continuity/ground, by means of megger. At the time of testing through megger person should not climb on the pole or touch the guarding, conductor, guy wire etc.

a. Before charging any new line, it should be ensured that the required inspection fee for the new line is paid to the Electrical Inspector and approval obtained from him for charging the line.

b. The line should be energized before the officer who has been authorized by the Project Manager in this regard.

c. Before energizing any new line, the contractor of the line shall notify to the workmen that the line is being energized and that it will no longer be safe to work on line. Acknowledgement of all the workmen in writing should be taken in token of having intimated them.

d. Wide publicity by Tom-toming should be arranged in all the localities through which the line, that is to be energized passes, intimating the time and date of energizing and warning public against the risk in meddling with the line.

e. The Officer-in-charge of the line shall personally satisfy himself that the same is in a fit state to be energized.

1.32 River Crossing

No special structures are to be erected for this work. River crossing more than normal span of poles are not considered under the package. For small rivers etc., data for the highest flood-level should be obtained for previous years. The structures should be located at such places that they should be approached under flood condition. Normal DP structures are to be used for such crossings on approval of Project Manager.

In case of river crossing with longer span, special designed structures are to be used for the purpose.
1.33 Guarding

Guarding is to be provided for the lines, so that a live conductor, when accidentally broken, is prevented to come in contact with other electric lines, telephone or telegraph lines, roads, and persons or animals and carriages moving along the road, by providing a sort of cradle below the main electric line.

Guarding is not required for crossings of 66 KV and higher voltage lines where the transmission line is protected by fast acting relay operated circuit breaker of modern design with a tripping time of the order of 0.25 sec. from occurrence of fault to its clearance. For all other crossings, guarding is essential for all telecommunication lines and major road crossing.

The guarding shall consist of GI guard cross arm of length 2.5 mtrs made out of 65x65x6 mm angle & shall be hot dipped galvanized generally conforming to IS : 2633/72. The clamps shall also be hot dipped galvanized generally conforming to IS: 2633/72 & suitable for 13 m 52 kgs/m rail pole & for 8.0 meters longs RCC poles. Guarding shall be erected with ground & line clearances as per the I.E. rules. Cradle guard wire should be of 8 SWG GI Wire provided with lashing of 10 SWG GI wire at a distance of 2 m along the length of the guarding. Tension clamps, threaded eye bolts, turn buckles, thimble, tying wires and hardware are as per specified in the specifications. A sketch showing arrangement of guarding at road crossing is enclosed with tender drawing.

The minimum height between any guard wires and live crossing conductor shall not be less than 1.5 m in case of a railway crossing.

1.34 Repair to conductors

The conductor shall be continuously observed for loose or broken strands or any other damage during the running out operations. Repair to conductors, if necessary, shall be carried out with repair sleeves. Repairing of the conductor surface shall be carried out only in case of minor damage, scuff marks, etc. The final conductor surface shall be clean, smooth and free from projections, sharp points, cuts, abrasions, etc. The Contractor shall be entirely responsible for any damage to the poles during stringing.

1.35 LT Lines and Service connection

1.35.1. The LT line shall be erected of single phase or three phase arrangements through AB Cable depending on site requirements. Every 6th pole of LT line shall be earthed with GI spike/GI Coil as per specifications.

1.35.2. In all those locations where LT AB cable is to be erected on the same support in which 11KV or 33KV line is also erected, proper isolation is to be maintained.

1.35.3. All single phase service connections released under the DDUGJY/IPDS schemes shall be provided with one earth point near the energy meter. This point is connected with the proper earthing system through GI wires. 10mm diameter earth knob in form of bolt and nut is to be installed on energy meter board. This earth point is to be maintained by service providing Distribution Company after installation and energisation. In up-stream network, this earth point is to be connected with earth point.

1.35.4. Service connection is to be issued on proper surveying of the location so that excessive erection of LT line or 11 KV line may be avoided. The service wire is to be hanged on supportive GI wire between pole support and the house. Before installing service wires and GI pipe on the consumer premises is to be erected using clamps/ nails/proper
binding etc. In case of hut or poor structure at consumer premises, GI pipe is to clamp on wooden planks/wooden structure existing in the house. The GI pipe should be supported for neutralizing tension by means of GI tie wire support. In pukka/brickwork/cement concrete foundations, house, GI support pipe is to be clamped by means of MS clips.

1.35.5. The consumer meter shall be installed at the premises of consumers at suitable height and at place which is not in direct approach of sun-light and rain water. Meters should be installed under the covering shade.
STANDARD BIDDING DOCUMENT

(FULL TURNKEY CONTRACT)

FOR

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

VOLUME-II

(PMS, QUALITY ASSURANCE)

Section-I: PMS, Quality Assurance & Evaluation Mechanism (QAM), Documentation & PMA

SPECIFICATION No. RECPDCL/TECH/JKPDD/e-Tender/2018-19/6522 dated-08.03.2019
VOLUME-II: SECTION – I

PROJECT MANAGEMENT SYSTEM (PMS),
QUALITY ASSURANCE & EVALUATION MECHANISM (QAM),
DOCUMENTATION & PMA
PROJECT MANAGEMENT SYSTEM, QUALITY ASSURANCE AND DOCUMENTATION

This section describes the project management system, quality assurance and documentation requirements for the project.

1. Project Management System

1.1. General

The Contractor shall assign a project manager with the authority to make commitments and decisions that are binding on the Contractor. Employer will designate a project manager to coordinate all employer project related activities. All communications between employer and the Contractor shall be coordinated through the project managers. The project managers shall also be assisting employer in communicating project related information to other stakeholders.

Bidder shall submit the manpower deployment plan along with the bids, describing the key roles of each person.

The role and responsibilities of contractor shall be as follows:

a) To prepare, maintain and update project detailed Work Execution Plan for successful implementation of project like approval of GTP, approval of sub-contractor, approval of drawings, supply of materials, mobilization of men, material and equipment etc. at site for successful completion of works, Compile and up-load physical as well as financial progresses, compile the progress of works at Employer level and to assist in forwarding it to all stake holders.

b) Resolving all issues relating to project implementation including ROW, Forest Clearances, Railway Crossings, and policy matters.

c) To actively participate in monitoring, reviewing and analysing the physical, financial and quality assurances works’ progress of IPDS/PMDP/IPDS works and also to take suitable measures on compliance of observations being raised during monitoring/review meetings with employer.

d) To implement and maintain a dedicated centralized bank account for the project, upload and up-date project wise physical progress in IPDS/PMDP/IPDS web portal. Physical as well as financial progresses shall be uploaded in standard Bill of Material format of the contract. Also, to submit claims as per release IPDS/PMDP/IPDS guidelines to Employer for release of payments/funds.

e) To oversee the progress and compliance of the Quality Assurance Mechanism as per IPDS/PMDP/IPDS guidelines.

1.2. Project Schedule

As per the schedule the bidder shall submit a preliminary implementation plan along with the bid. The detailed project implementation schedule shall be submitted by the contractor after the award for employer’s approval, which shall include at least the following activities:

(a) Surveying of site.
(b) Documents submission and approval schedule
(c) Type Testing Schedule
(d) Dispatch Schedule
(e) Installation & commissioning schedule
(f) Training schedule, if any.

The project schedule shall include the estimated period for completion of project and its linkage with other activities.
1.3. **Progress Report**

A progress report shall be prepared by the Contractor each month against the activities listed in the project schedule. The report shall be made available to employer on a monthly basis, e.g., the 10th of each month. The progress report shall include all the completed, ongoing and scheduled activities.

1.4. **Transmittals**

Every document, letter, progress report, change order, and any other written transmissions exchanged between the Contractor and employer shall be assigned a unique transmittal number. The Contractor shall maintain a correspondence index and assign transmittal numbers consecutively for all Contractor documents. Employer will maintain a similar correspondence numbering scheme identifying documents and correspondence that employer initiates.

2. **Quality Assurance and Evaluation Mechanism**

The Project Implementation Agency (PIA) shall be solely responsible & accountable for assuring quality in IPDS & PMDP works. Project Implementing Agency (PIA) shall formulate a detailed comprehensive Quality Assurance (QA) plan for the works to be carried out under IPDS/PMDP scheme with an objective to create quality infrastructure works. The QA and Inspection Plan shall be integral part of the contract agreement with turnkey contractor or equipment supplier and erection agency as the case may be in case of turnkey/ or departmental execution of works. PIA has to ensure that the quality of materials/equipment supplied at site and execution of works carried out at field under IPDS/PMDP scheme is in accordance to Manufacturing Quality Plan (MQP)/Guaranteed Technical Particulars (GTP) and Field Quality Plan (FQP)/Approved Drawings/Data Sheets respectively.

2.1. **Quality checks to be ensured by PIA/Turnkey Contractor:**

PIA & Turnkey Contractor shall strictly ensure QA checks during the day to day course of project execution, which are as follows:

a. 100% pre-dispatch inspections of all materials viz. as per MQP/ Approved Drawings/ Technical Specifications/Datasheet/GTP/applicable national & international standards.

b. 100% of all material for quality as per MQP/Approved Drawings/Technical Specifications/Datasheet/GTP and erection works in the field as per FQP/approved survey drawings/layout.

c. 100% verification of materials utilized under the scheme.

d. 100% verification of works done in Smart Metering.

Also, PIA & Turnkey Contractor have to carry out quality assurance of works under this project.

2.1.1. **Vendor approval:** All the materials procured for IPDS/PMDP works shall be purchased from the authorised vendors approved by their Quality Assurance Department of PIA. Approved vendors list is to be uploaded periodically (monthly) on the PIA web portal.

New vendors/suppliers may be approved by PIAs, provided capability of manufacturer/s is assessed suitably by visiting the factory premises and checking the testing facility available before accepting it as approved vendor. If required, State Electricity Board/Power Department/ Distribution Companies may adopt vendors already approved by CPSUs.

2.1.2. All materials required for this project for **IPDS/PMDP works** shall be inspected at manufacturer works/premises before dispatch at site. The materials to be used under the scheme shall be as per Technical Specification attached with Standard Bidding Document of this scheme or as per latest relevant Indian Standards/approved Datasheet/drawings/GTP/MQP at the cost of contractor.
2.1.5. TESTING AND ACCEPTANCE PROCEDURES

Testing and quality assurance in software development is more rigorous since each component has to be more reliable, if it is to be reused. A system is tested at various stages of development and deployment. For example, each component is tested as a unit for checking the correctness of its own code. Further, the component is tested with its dependent components. After final release of the entire set of components, system is tested for the correctness of system functionality. Finally the components are further tested in simulated production load for performance and load analysis.

The Implementation Agency shall be responsible for the testing processes such as planning (includes preparing test plans and defining roles and their responsibilities), preparation (consists of preparing test specification, test environment and test data) and execution (includes testing at various levels like unit level, integration level, system level and production).

1. TEST PLAN

Test plans are prepared for each phase of testing. The initial test plan is created during the Project Planning phase. The initial test plan describes who performs which type of testing and when. Ideally master test plan covers all types of test i.e. from unit testing to production testing. The Implementation Agency is expected to submit the test plans to Utility for approval. Any changes made to the test plan during the project life cycle should be communicated to UTILITY for approval.

2. TEST SCENARIOS

The Selected Bidder should prepare test scenario for each business scenario. A test scenario when executed should fulfill a business requirement as per the scope of business functionality. Test scenarios include following:

a) Test Specification - During the test specification phase, the test cases are specified. It consists of description of the input, process to be executed and a prediction of output results.

b) Test Environment - Component developer does unit testing and integration testing. Integration testing can be delegated to a specialized testing group. Each of the members in the testing group is provided with testing environment according to his/her role and responsibilities.

Following is sample testing environment for testing:

- A workstation
- A set of tools and applications required on workstation like access to user interface, browser etc.
- Access to centralized document database (where all the project related documents are maintained)
- Access to testing tools and defect logging tools
- Access to the central database or repository for development and unit testing (this database contains sample test data)
- Access to deployed components

b) Test Data - Test data is prepared for testing at each stage. The test data should be prepared in such a way that it covers basic path and every alternate path of the code. The basic path
3. Test Execution

The following testing steps are usually employed in the project lifecycle. The Implementation Agency is expected to follow these steps:

a) Unit Testing - In unit testing, each piece of code has to be rigorously tested. At this stage testing is done according to the priority of path of code. All the test results are logged in the defect logging tools. After the completion of testing, code is corrected for defect logs. This process is iterative till criteria for successful testing is reached.

b) Integration Testing - Upon completion of unit testing, integration testing begins. The purpose is to ensure distinct components of the application still work in accordance to customer requirements. Test sets will be developed with the express purpose of exercising the interfaces between the components. This activity is to be carried out by the Test Team. Integration test will be termed complete when actual results and expected results are either in line or differences are explainable/acceptable based on client input.

c) Incremental Integration Testing - Continuous testing of an application as new functionality is added.

d) System Testing - System testing is performed when all the components are delivered to central repository prior to the release of the software. The testing is done on priority basis of business processes. All the defects are logged and assigned to respective component owners. The component and unit testing is performed after the correction of code. However, it may depend on size and type of individual test specifications. Impact analysis is useful to narrow done testing efforts by identifying critical test cases affected due to code change.

e) Pre-Production Testing – Pre-Production testing is done simulating the production load. Test data is either prepared or generated from the tools. This testing is used to evaluate performance, load capacity and concurrency. Load testing tools can also be used for this purpose.

f) DC-DR Failover Testing - Upon completion of DC DR Setup, Switchover activity needs to be performed to validate the mentioned RPO & RTO. A test report will be documented and shared.

Following special types of testing are done during Pre-Production Testing Phase:

i. Regression Testing - The objective of regression testing is to ensure software remains intact. A baseline set of data and scripts will be maintained and executed to verify changes introduced during the release have not "undone" any previous code. Expected results from the baseline are compared to results of the software being regression tested. All discrepancies will be highlighted and accounted for, before testing proceeds to the next level.

ii. Performance Testing - Although performance testing is described as a part of system testing, it can be regarded as a distinct level of testing. Performance testing will verify the load, volume, and response times as defined by requirements.

iii. Load Testing - Testing an application under heavy loads, such as the testing of a web site under a range of loads to determine at what point the systems response time degrades or fails.

iv. Installation Testing - Testing full, partial, or upgrade install/uninstall processes. The installation test for a release will be conducted with the objective of demonstrating production readiness. This test is conducted after the application has been migrated to the client’s site. It will encompass the inventory of configuration items (performed by the application’s System Administration) and evaluation of data readiness, as well as dynamic tests focused on basic system functionality. When necessary, a sanity test will be performed following the installation testing.
v. **Security/Penetration Testing** - Testing how well the system protects against unauthorized internal or external access, wilful damage, etc. This type of testing may require sophisticated testing techniques:

vi. **Recovery/Error Testing** - Testing how well a system recovers from crashes, hardware failures, or other catastrophic problems.

g) **Acceptance Testing** – During the test scenarios definition, for each of the business scenario, an acceptance criterion is defined. Acceptance criteria include expected behaviour of the s/w component and the expected results (data). Expected results form a part of the Exit Criteria. In addition to expected result and behaviours, some conditions are also specified in the exit criteria. They can be:
- Number of bugs to be discovered for a functional module. This depends on size of the functionality and is an indicator of amount of testing done.
- If any medium or low-priority errors are outstanding - the implementation risk must be signed off as acceptable by Utility and Implementation Partner along with consortium partners
- All High Priority errors from System Test must be fixed and tested

Implementation Agency needs to get the acceptance criteria approved from Utility for all the functional components of the system. The Acceptance Criteria for each release into production environment will be agreed upon by Implementation Agency in consultation with Utility prior to release from Testing to production environment. After installation, if any bug is reported or there is non-compliance to requirements then a proper procedure should be followed. End-user should report (“Change Request”) to his/her supervisor about the bug that will in turn get forwarded to Project Manager (PM). PM will forward the List of change request to Implementation Partner along with consortium partners. After the bug is fixed, it should be reflected in the production copy after testing it.

h) **Performance Testing** - The bidder has to test and demonstrate the operational performance requirement as defined in the clause 9 of the specification after completion of entire scope.

This will be part of acceptance testing. The system will be taken over by owner only after successful operational performance testing. The bidder has to arrange necessary hardware / software to demonstrate the performance testing.

2.1.6. Bidder should note that RECPDCL/JKPDD can appoint a third party agency for conducting any part of above testing procedures (in addition to the testing carried out by the bidder).

2.1.7. **QA documentation:** All the quality assurance checks shall be conducted in the field as per approved Field Quality Plan(FQP) and shall be documented properly and signed by the quality engineer of the turnkey contractor & countersigned by PIA's representative and shall be kept for future reference. These documents shall be maintained by PIAs in proper order and shall be made available at site for verification by Quality Monitors during inspection.

2.2. **Quality Assurance Mechanism to be envisaged by REC/MoP for IPDS/PMDP Projects**

IPDS/PMDP Projects shall have a single tier Quality Assurance Mechanism (QAM). The single tier QAM shall exclude the in-house process quality checks followed by the Project Implementation Agency (PIA) during the physical execution of the project.

**PFC**, the nodal agency for the IPDS/PMDP scheme shall operate for Quality Assurance Mechanism. REC shall designate a senior officer (ZM/CPM of the state) as REC State Quality Assurance Coordinator (RSQAC) at its State level Zonal/Project office. REC corporate office shall designate a senior officer not below the level of AGM/GM as RQAC.

Under this mechanism, **RQM shall oversee the compliance of IPDS/PMDP guidelines**, adherence to system procedures etc. shall be verified by an independent inspecting agency.
REC shall outsource independent agency(ies) designated as REC Quality Monitors (RQM) to ensure quality of materials procured and shall also verify quality of works carried out under the IPDS/PMDP scheme. RQM shall carry out pre-dispatch inspection of six materials randomly in a single lot containing minimum 10% materials at manufacturer works. RQM shall also verify quality of works carried out in the Project, which are as follows:

- 10% of new Distribution substations,
- 100% of new substations (66/11 or 33/11kV),
- 100% of augmented substations (66/11 or 33/11kV),

2.2.1. Material Inspection:
Material/equipment shall be inspected by the RQM as per MQP. The inspection/testing/witnessing of acceptance tests shall be as per approved Drawings/Technical Specifications/Datasheet/GTP/ and applicable national & international standard.

2.2.1.1. Sampling from field: Any material, including materials listed below, may be picked from site for testing at test laboratory chosen by inspecting official.

i. Energy Meter,
ii. Cables,

All expenditures that shall incurred towards packing, transport, inspection, testing charges etc. are to be borne by the PIA.

2.2.2. Inspections are to be done as per approved FQP/Drawings/Technical Specifications/Datasheet/survey report. The inspection that shall be carried out by REC Quality Monitors, which are as hereunder:

2.2.2.1. (a) Inspection of 100% new (33/11 or 66/11 kV) substation for quality works as per FQP.

(b) Inspection of 100% augmented (33/11 or 66/11 kV) substation for quality works as per FQP.

2.2.3. REC Quality Monitor shall also oversee the Contract Management Part of PIA like adherence to Standard Bidding Document, PMA appointment, adherence to Quality Assurance Mechanism of IPDS/PMDP scheme, Contractual provisions pertaining to defects identification and rectification, resolution of project related issues and action on delayed project. In their visit, RQM would give thrust on adherence on systems and procedures of IPDS/PMDP schemes by PIA and turnkey contractors during project implementation. Also, RQM would ensure availability and awareness of project specific drawings, documents, quality assurance plans among all stake holders in PIA contractor staff/workers.

2.2.4. REC Quality Monitors shall oversee the progress of up-loading of monitoring observations raised by inspectors during inspection and submission of compliance by PIA with supporting site photographs details in IPDS/PMDP web portal.

2.3. GENERAL

2.3.1. To ensure that the equipment and services under the scope of this Contract whether manufactured or performed within the Contractor’s Works or at his Sub-contractor’s premises or at the Employer’s site or at any other place of Work are in accordance with the specifications, the Contractor shall adopt suitable quality assurance programme to control such activities at all points necessary. Such programme shall be broadly outlined by the contractor and finalized after discussions before the award of contract. The detailed programme shall be submitted by contractor after the award of contract and finally accepted by the Employer after discussions. A quality assurance programme of the contractor shall generally cover the following:
a) His organization structure for the management and implementation of the proposed quality assurance programme:

b) Documentation control system;

c) Qualification data for bidder’s key personnel;

d) The procedure for purchases of materials, parts components and selection of sub-Contractor’s services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.

e) System for shop manufacturing and site erection controls including process controls and fabrication and assembly control;

f) Control of non-conforming items and system for corrective actions;

g) Inspection and test procedure both for manufacture and field activities.

h) Control of calibration and testing of measuring instruments and field activities;

i) System for indication and appraisal of inspection status;

j) System for quality audits;

k) System for authorizing release of manufactured product to the Employer.

l) System for maintenance of records;

m) System for handling storage and delivery; and

n) A manufacturing quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered.

o) A Field quality Plan covering field activities

2.3.2. The manufacturing & Field quality Plans shall be mutually discussed and approved by the Employer after incorporating necessary corrections by the Contractor as may be required.

2.3.3. The Employer or his duly authorized representative reserves the right to carry out quality audit and quality surveillance of the system and procedure of the Contractor/his vendor’s quality management and control activities.

2.3.4. The Contractor would be required to submit all the Quality Assurance documents as stipulated in the Quality Plan at the time of Employer’s Inspection of equipment/material.

2.4. TYPE & ACCEPTANCE TESTS

The following type, acceptance and routine tests and tests during manufacture shall be carried-out on the material. For the purpose of this clause:

2.4.1. Contractor shall supply the materials of type & design which has already been Type Tested. Contractor shall provide copy of such tests at site in support of type-tested materials supplied under the contract. No extra payment or time shall be granted for type testing of materials. In exceptional case to case basis, employer will decide to permit type testing of material at contractor’s cost.

2.4.1.1. Acceptance Tests shall mean those tests which are to be carried out on samples taken from each lot offered for pre-dispatch inspection, for the purposes of acceptance of that lot.

2.4.1.2. Routine Tests shall mean those tests, which are to be carried out on the material/equipment to check requirements which are likely to vary during production.

2.4.1.3. Tests during Manufacture shall mean those tests, which are to be carried out during the process of manufacture and end inspection by the Contractor to ensure the desired quality of the end product.
2.4.1.4. The norms and procedure of sampling for these tests will be as per the Quality Assurance Programme to be mutually agreed to by the Contractor and the Owner.

2.4.1.5. The standards and norms to which these tests will be carried out are listed against them. Where a particular test is a specific requirement of this Specification, the norms and procedure of the tests shall be as per IS/IEC Standard this specification or as mutually agreed to between the Contractor and the Owner in the Quality Assurance Programme.

2.4.1.6. For all type test and acceptance tests, the acceptance values shall be the values specified in this Specification, Approved Quality Plan or guaranteed by the Bidder, as applicable.

2.5. TYPE TESTING, INSPECTION, TESTING & INSPECTION CERTIFICATE

2.5.1. All equipment being supplied shall conform to type tests including additional type tests, if any as per technical specification and shall be subject to routine tests in accordance with requirements stipulated under respective sections. Employer reserves the right to witness any or all the type tests. The Contractor shall intimate the Employer the detailed program about the tests at least three (3) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies.

2.5.2. The reports for all type tests and additional type tests as per technical specification shall be furnished by the Contractor alongwith equipment/material drawings. The type tests conducted earlier should have either been conducted in accredited laboratory (accredited based on ISO/IEC Guide 25/17025 or EN 45001 by the national accreditation body of the country where laboratory is located) or witnessed by the representative(s) of Employer or Utility. The test-reports submitted shall be of the tests conducted within last 10 (ten) years prior to the date of bid opening. In case the test reports are of the test conducted earlier than 10 (ten) years prior to the date of bid opening, the contractor shall repeat these test(s) at no extra cost to the Employer.

2.5.3. In the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the Technical Specification or any/all additional type tests not carried out, same shall be carried out without any additional cost implication to the Employer.

2.5.4. The Employer, his duly authorized representative and/or outside inspection agency acting on behalf of the Employer shall have at all reasonable times free access to the Contractor's/sub-vendors premises or Works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if part of the Works is being manufactured or assembled at other premises or works, the Contractor shall obtain for the Engineer and for his duly authorized representative permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the Employer and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.

2.5.5. The Contractor shall give the Employer/Inspector ten (10) days written notice of any material being ready for joint testing including contractor and Employer. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Employer/Inspector, unless witnessing of the tests is virtually waived, will attend such tests within thirty (30) days of the date of which the equipment is notified as being ready for test/inspection, failing which the Contractor may proceed alone with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.

2.5.6. The Employer or Inspector shall, within fifteen (15) days from the date of inspection as defined herein give notice in writing to the Contractor, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due
consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Employer/Inspector giving reasons therein, that no modifications are necessary to comply with the Contract. If any modification is made on the equipment on the basis of test results not in conformity with the contract, the modified equipment shall be subject to same sequence of test again without any additional cost to Employer.

2.5.7. When the factory tests have been completed at the Contractor’s or Sub-Contractor’s works, the Employer/Inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Employer/Inspector, the certificate shall be issued within fifteen (15) days of receipt of the Contractor’s Test certificate by the Engineer/Inspector. Failure of the Employer/Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the Works. The completion of these tests or the issue of the certificate shall not bind the Employer to accept the equipment should, it, on further tests after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of dispatch instruction by the Employer.

2.5.8. In all cases where the Contract provides for tests whether at the premises or at the works of the Contractor or of any Sub-Contractor, the Contractor except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Employer/Inspector or his authorized representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Employer/Inspector or to his authorized representative to accomplish testing.

2.5.9. The inspection by Employer and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed quality assurance programme forming a part of the Contract.

2.5.10. The Employer will have the right of having at his own expenses any other test(s) of reasonable nature carried out at Contractor’s premises or at site or in any other place in addition of aforesaid type and routine tests, to satisfy that the material comply with the specification.

2.5.11. The Employer reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipment for these tests shall be provided by the Employer.

2.5.12. The Employer intends that type tests and additional type tests are conducted on Power/Distribution Transformers, Pin & Disc Insulators, 33 kV/11 kV LT AB cables, Conductors, 66 kV / 33 kV & 11 kV Vacuum circuit breaker, Battery Charger and energy meter. The price of conducting type tests and additional type tests shall be included in Bid price.

2.5.13. In case the contractor opts to procure these items from more than one manufacturer, the type test shall be conducted in respect of all the manufactures. No type test / repeat type test charges shall be paid by owner.

2.5.14. Purchaser reserves the right to witness any or all the type tests.

2.6. PRE-COMMISSIONING TESTS

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Employer and the contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre-commissioning tests at Site. The list of pre-commissioning tests to be performed is given in respective chapters or as included in the Contractor’s quality assurance programme.
2.7. COMMISSIONING TESTS

All required instrumentation and control equipment will be used during such tests and the contractor will use all such measuring equipment and devices duly calibrated as far as practicable. However, the Contractor, for the requirement of these tests, shall take immeasurable parameters into account in a reasonable manner. The tests will be conducted at the specified load points and as near the specified cycle condition as practicable. The contractor will apply proper corrections in calculation, to take into account conditions, which do not correspond to the specified conditions.

2.7.1. Any special equipment, tools and tackles required for the successful completion of the Commissioning tests shall be provided by the contractor, free of cost.

2.8. The specific tests to be conducted on equipment have been brought out in the respective chapters of the technical specification. However where the pre-commissioning tests have not been specified specifically they shall be as per relevant IS code of practice or as mutually agreed.

2.9. The Contractor shall be responsible for obtaining statutory clearances from the concerned authorities for commissioning and operation of the equipment including the Electrical Inspector.

3. Documentation

3.1. GENERAL

3.1.1. To ensure that the proposed systems conform to the specific provisions and general intent of the Specification, the Contractor shall submit documentation describing the systems to employer for review and approval. The contractor shall obtain approval of employer for the relevant document at each stage before proceeding for manufacturing, system development, factory testing, site testing, training etc. The schedule for submission/approval of each document shall be finalised during the discussions before placement of the contract, this schedule shall be in line to overall project schedule.

3.1.2. Each document shall be identified by a Contractor document number, the employer document number, and the employer purchase order number. Where a document is revised for any reason, each revision shall be indicated by a number, date, and description in a revision block along with an indication of official approval by the Contractor's project manager. Each revision of a document shall highlight all changes made since the previous revision.

3.1.3. All technical description, specifications, literature, correspondence, prints, drawings, instruction manuals, test reports( both factory and at site), progress photographs, booklets, schedules and all supplementary data or documents furnished in compliance with the requirements of the Contract, shall become the property of the Employer and the costs shall be considered as included in the Contract price.

3.1.4. The Contractor shall be responsible for any time delay, misinterpretation, error and conflict during design, manufacturing, testing and erection of the Works resulting from non-compliance with the requirements of this Specification.

3.1.5. The Employer shall have the right to make copies of any documents, data, reports, information etc. supplied by the Contractor in connection with the Works. The Employer shall not impart the information of these documents to any other manufacturer or competitor but he shall be free to use these for preparation of technical papers, reports etc.

3.1.6. All documentation shall be in English language.
3.2. REQUIREMENTS FOR SUBMISSION OF DOCUMENTS, INFORMATION AND DATA BY THE CONTRACTOR

3.2.1. The Contractor shall submit to the Employer all documents in accordance with an approved schedule of submissions and shall submit any further information (in the form of drawings, documents, manuals, literature, reports etc.) when asked by the Employer while commenting/approving any drawings/documents etc.

3.2.2. The documents which are subject to the approval of the Employer shall be identified by the Contractor with the stamp "FOR APPROVAL". All other documents shall be submitted to the Employer for information and shall be identified by the Contractor with the stamp "FOR INFORMATION".

3.2.3. The sequence of submission of the documents shall be subject to the approval of the Employer. The sequence of submissions of all documents shall be such that the necessary information is available to enable the Employer to approve or comment the document.

3.2.4. The Contractor shall supply 4 hard copies of all drawings and documents.

3.2.5. In case a "SUBSEQUENT" revision of any document is made due to any reason whatsoever, a revision of the same, highlighting the changes shall be resubmitted for the Employer's specific approval/information.

3.3. DOCUMENTS FOR APPROVAL

3.3.1. The Employer shall be allowed fifteen (15) calendar days to approve the Contractor's submissions. The submissions for approval, shall be returned to the Contractor marked in one of the following ways:

| Category I: | Approved |
| Category II: | Approved with Comments. |
| Category III: | Returned for correction. |
| Category IV: | For information |

3.3.2. The first notations "I" or "II" shall be deemed to permit the Contractor to proceed with the work shown on the document, except in the case of notation "II" the work shall be done subject to the corrections indicated thereon and/or described in the letter of transmittal. The Contractor shall bear the full responsibility for proceeding with the Works prior to receipt of the release in notation "I" from the Employer.

3.3.3. In case of notation "II", the Contractor shall include the alterations required & resubmit the document within fifteen (15) days from date of Employer's letter of transmittal.

3.3.4. In case of notation "III", the Contractor shall include the alterations required and resubmit the document to the Employer, within fifteen (15) days, from date of letter of transmittal, so that such document can be returned with the notation "I" or "II".

3.3.5. It may also be noted that the approval/commenting by the Employer does not relieve the Contractor of any of his contractual obligations and his responsibilities for correctness of dimensions, materials, weights, quantities or any other information contained therein, as well as the conformity of designs with Indian Statutory Laws or equivalent laws of J&K and the Technical Specifications as may be applicable. The approval also does not limit the Employer's rights under the Contract.

3.3.6. The approved documents shall be considered as the working documents. However the Technical Specification and connected documents shall prevail over these documents in case a decision is required on interpretation.

3.4. DOCUMENTS FOR INFORMATION
The Contractor shall not delay the Works pending the receipt by the Contractor of the comments on documents submitted to the Employer for information. However, the Employer shall have the right to comment on all the documents submitted by the Contractor, when, in the opinion of the Employer the document does not comply with the Contract or otherwise. The Contractor shall satisfactorily demonstrate that the information contained in the aforesaid document does meet the requirements of the Contract or revise the document in order that the information shall comply with the requirements of the Contract.

3.5. BASICREFERENCE DRAWINGS

3.5.1. The reference drawings are enclosed with the bid document, which forms a part of the specification. The contractor shall develop a new layout in line with the specification and take the approval of the EMPLOYER. The contractor shall maintain the overall dimensions of the substation, buildings, bay length, bay width, phase to earth clearance, phase to phase clearance and sectional clearances, clearances between buses, bus heights but may alter the locations of equipment to obtain the statutory electrical clearances as required for the substation.

3.5.2. All drawings submitted by the Contractor including those submitted at the time of bid shall be in sufficient detail to indicate the type, size, arrangement, material description, Bill of Materials, weight of each component, break-up for packing and shipment, dimensions, internal & the external connections, fixing arrangement required and any other information specifically requested in the specifications.

3.5.3. Each drawing submitted by the Contractor shall be clearly marked with the name of the Employer, the unit designation, the specifications title, the specification number and the name of the Project. If standard catalogue pages are submitted, the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in metric units.

3.5.4. Further work by the Contractor shall be in strict accordance with these drawings and no deviation shall be permitted without the written approval of the Employer, if so required.

3.5.5. The review of these data by the Employer will cover only general conformance of the data to the specifications and documents interfaces with the equipment provided under the specifications. This review by the Employer may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the Employer shall not be considered by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents.

3.5.6. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the Contractor’s risk. The Contractor may make any changes in the design which are necessary to make the equipment conform to the provisions and intent of the Contract and such changes will again be subject to approval by the Employer. Approval of Contractor’s drawing or work by the Employer shall not relieve the contractor of any of his responsibilities and liabilities under the Contract.

3.5.7. All engineering data submitted by the Contractor after final process including review and approval by the Employer shall form part of the Contract Document and the entire works performed under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the Employer in Writing.

3.6. PRE-DISPATCH INSPECTION:
Pre-dispatch inspection shall be performed on various materials at manufacturer’s work place for which contractor shall be required to raise requisition giving at least 10-day time. Depending on requirement, inspection shall be witnessed by representatives of Employer, TPIA and/or REC/PFC/MoP.

The contractor shall ensure receipt of material at site within 21 days from date of receipt of dispatch instructions. In case materials are not received within 21 days from date of issue of dispatch instruction, the dispatch instruction shall stand cancelled. In the event of delay in receipt of materials beyond 21 days due to reasons not attributed to turnkey contractor supplier, suitable time extension may be permitted by the Employer. All expenditure incurred by Employer in performance of dispatch instruction shall be recovered from turnkey contractor.

The turnkey contractor shall ensure that pre-dispatch inspection for materials are intimated only when the material is completely ready for inspection. On due date of inspection, if it is found that materials are not ready in required quantities or the inspection could not be carried out due to non-availability of requisite calibrated certificate of instruments with manufacturer, closing of works on scheduled date of inspection, non-availability of sufficient testing/material handling staff at manufacturer works etc, all expenditures incurred on deployment of various inspecting officials along with a fine of Rs 50,000/- shall be recovered from the bills of the agency and re-inspection shall be carried out on expense of contractor. 2nd situation at same manufacturer/supplier shall result in rejection of name of manufacturer from list of approved vendors/sub-vendors. In case sub-standard materials (old component, re-cycled materials, re-used core material, re-used transformer coil material etc) offered for inspection and are noticed during the inspection, materials shall be rejected and approval of sub-vendor shall also be cancelled for all IPDS/PMDP projects.

4. **Project Management Agency (PMA)**

Contractor shall assist Employer in Project Planning and Implementation of the project as under:

4.1. **Project Planning and Implementation:**

   4.1.1. Assisting Employer in preparation of detailed work implementation schedule in association with turnkey contractor.

   4.1.2. Coordination & monitoring of project implementation activities.

   4.1.3. To monitor DPR wise monthly physical & financial progress of the scheme, prepare a consolidated report & submit to utility for onward submission to Nodal Agency.

   4.1.4. Identification of anticipated bottlenecks in project implementation & preparation of remedial action plan in consultation with Employer & Contractor.

   4.1.5. To assist Employer in addition of the created assets to their asset register.

   4.1.6. Recommend the claim of utility for fund release from Nodal Agency. The recommendation is to be supported by a report on expenditure, progress and constraints if any for timely completion of project.

   4.1.7. Submit a report to Nodal Agency, regarding Project Completion and expenditure incurred along with recommendation in accordance with the guidelines.

   4.1.8. To assist utility in supervision of flow of funds in dedicated bank account of projects.

4.2. **Quality Monitoring:**

   4.2.1. To prepare a Quality Assurance (QA) Plan

   4.2.2. To carry out field quality inspection of ongoing/ completed works

   4.2.3. Joint inspection of material at site on sample basis i.e. 10% of major materials (Meters, Cable etc).
VOLUME-II: Section-II

Bid Forms (Bid Envelope)
To:

XXXXXXXX (Name of Employer)

XXXXXXXX (Address of Employer)

Name of Contract: Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Specification No.:XXXXXXXXXXXXXXXXXXXXXXXXXX).

Dear Sir/ or Madam,

1.0 Having examined the Bidding Documents, including Amendment Nos. (Insert Numbers) ....... dated ................., the receipt of which is hereby acknowledged, we the undersigned, offer to design, manufacture, test, deliver, install and commission (including carrying out Trial operation, Performance & Guarantee Test as per the provision of Technical Specification) the Facilities under the above-named Project in full conformity with the said Bidding Documents. In accordance with ITB Clause 9.1 of the Bidding Documents, as per which the bid shall be submitted by the bidder under "Single Stage - Bid Envelope" procedure of bidding. Accordingly, we hereby submit our Bid, in Bid envelope i.e. Techno – Commercial Part. Price Part i.e. Price is uploaded. We have submitted and uploaded on-line price bid through e-mode to be opened subsequently.

2.0 Attachments to the Bid Form (Bid Envelope)

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments:

(a) Attachment 1: Bid Security, in a separate envelope, in the form of Bank Draft/Pay Order/Banks certified Cheque/Bank Guarantee* for a sum of ................................. (name of currency and amount in words)
and figures) initially valid for a period of seven (07) months from the date set for opening of bids.

* delete whichever is not applicable.

(b) Attachment 2: A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the ITB Clause 14.

(c) Attachment 3: The documentary evidence that we are eligible to bid in accordance with ITB Clause 2. Further, in terms of ITB Clause 9.3 (c) & (e), the qualification data has been furnished as per your format enclosed with the bidding documents [Attachment-3(QR). * Further, the required Consortium Agreement signed by us and our Partners has also been furnished as per your format [Attachment-3(JV).

* Delete if not applicable

(d) Attachment 4: The documentary evidence establishing in accordance with ITB Clause 3, Vol.-I of the Bidding Documents that the facilities offered by us are eligible facilities and conform to the Bidding Documents has been furnished as Attachment 4. A list of Special Tools & Tackles to be used by us for erection, testing & Commissioning and to be handed over to Employer, the cost of which is included in our Bid Price, is also enclosed as per your format as Attachment 4A. A list of Special Tools & Tackles to be brought by the contractor for erection, testing & Commissioning and to be taken back after completion of work, whose cost in not included in our bid price, is enclosed as per your format as Attachment 4B.

(e) Attachment 5: The details of all major items of services or supply which we propose subletting in case of award, giving details of the name and nationality of the proposed subcontractor/sub-vendor for each item.

(f) Attachment 6: The variation and deviations from the requirements of the Conditions of Contract, Technical Specification and Drawings (excluding critical provisions as mentioned at clause 6.0 below) in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.

(g) Attachment 7: The details of Alternative Bids made by us indicating the complete Technical Specifications and the deviation to contractual and commercial conditions. [Not Applicable]
(h) Attachment 8: Manufacturer’s Authorisation Forms - registered/notarized

(i) Attachment 9: Work Completion Schedule.

(j) Attachment 10: Guarantee Declaration.

(k) Attachment 11: Information regarding ex-employees of Employer in our firm.

(l) Attachment 12: Filled up information regarding Price Adjustment Data as per the format enclosed in the bidding documents

(m) Attachment 13: Declaration regarding Social Accountability

(n) Attachment 14: Integrity Pact, in a separate envelope, duly signed on each page by the person signing the bid.

(o) Attachment 15: Option for Interest bearing Initial Advance payment and Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises

(p) Attachment 16: Additional Information

(q) Attachment 17: Declaration for tax exemptions, reductions, allowances or benefits

(r) Attachment 18: Declaration

(s) Attachment 19: Bank Guarantee verification checklist

(t) Attachment 20: Team Structure & Responsibilities

(u) Attachment 21: Acceptance form for participation in reverse auction event

(f) Attachment 22: Technical Solution with Approach & Methodology

3.0 We are aware that, in line with Clause No. 27.1 (ITB), our online price bid is liable to be rejected in case the same contains any deviation/omission from the contractual and commercial conditions and technical Specifications other than those identified in this Bid Envelope.

3.1 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the technical specifications, scope of works and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices in price schedule quoted and uploaded in e-procurement web-portal.
3.2 We declare that as specified in Clause 11.5, Section –II:ITB, Vol.-I of the Bidding Documents, prices quoted by us in the Price Schedules shall be fixed and firm during the execution of Contract except for the permitted items for which Price Adjustment is applicable, as mentioned in Appendix-2 (Price Adjustment) to the Contract Agreement of Volume-I : Section-VI (Sample Forms and Procedures).

4.0 We confirm that except as otherwise specifically provided our Bid Prices quoted and uploaded in e-procurement web portal include all taxes, duties, levies and charges as may be assessed on us, our Sub-Contractor/Sub-Vendor or their employees by all municipal, state or national government authorities in connection with the Facilities, in and outside of India.

5.0 Construction of the Contract

5.1 We declare that we have studied Clause GCC 2.1 relating to mode of contracting for Domestic Bidders and we are making this proposal with a stipulation that you shall award us two separate Contracts viz ‘First Contract’ for supply of all equipment and materials including mandatory spares and ‘Second Contract’ for providing all the services i.e. inland transportation for delivery at site, insurance, unloading, storage, handling at site, installation, testing and commissioning including Trial operation in respect of all the equipment supplied under the ‘First Contract’ and other services specified in the Contract Documents. We declare that the award of two contracts, will not, in any way, dilute our responsibility for successful operation of plant/equipment and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be classified as a breach of the other contract which will confer on you the right to terminate the other contract at our risk and cost.

6.0 We have read the provisions of following clauses and confirm that the specified stipulations of these clauses are acceptable to us:

(a) ITB 13 Bid Security
(b) GCC 2.14 Governing Law
(c) GCC 8 Terms of Payment
(d) GCC 9.3 Performance Security
(e) GCC 10 Taxes and Duties
(f) GCC 21.2 Completion Time Guarantee
(g) GCC 22 Defect Liability
(h) GCC 23 Functional Guarantee
(i) GCC 25 Patent Indemnity
(j) GCC 26 Limitation of Liability
(k) GCC 38 Settlement of Disputes
(l) GCC 39 Arbitration
(m) ITB 27.8 Reverse Auction

Further we understand that deviation taken in any of the above clauses by us may make our bid non-responsive as per provision of bidding documents and be rejected by you.
7.0 We undertake, if our bid is accepted, to commence the work immediately upon your Notification of Award to us, and to achieve the delivery of goods and related services within the time stated in the Bidding Documents.

8.0 If our bid is accepted, we undertake to provide a Performance Security(ies) in the form and amounts, and within the times specified in the Bidding Documents.

9.0 We agree to abide by this bid for a period of six (06) months from the date fixed for opening of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

10.0 Until a formal Contract is prepared and executed between us, this bid, together with your written acceptance thereof in the form of your Notification of Award shall constitute a binding contract between us.

11.0 We understand that you are not bound to accept the lowest or any bid you may receive.

12.0 *(For Consortiums only)* We, the partners of Consortium submitting this bid, do agree and confirm that in case of Award of Contract on the Lead Bidder on behalf of Consortium, we shall be jointly and severally liable and responsible for the execution of the Contract in accordance with Contract terms and conditions.

13.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named here 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 the award is made on us, that this proposal is made without any connection with any other person, firm or party likewise submitting a proposal is in all respects for and in good faith, without collusion or fraud.

Dated this ____ day of ________20__

Thanking you, we remain,

Yours Sincerely,

For and on behalf of the [Name of the Bidder#]

(Signature).................................

(Printed Name).............................

(Designation).............................

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Date:
Place:

Business Address:

Country of Incorporation:
(State or Province to be indicated)

Name of the Principal Officer:

Address of the Principal Officer:

*Applicable in case of a bid from Consortium.

Note: Bidders may note that no prescribed proforma has been enclosed for:

(a) Attachment 2: Power of Attorney.

(For Attachments 2 Bidders may use their own proforma for furnishing the required information with the bid).
List of Attachments

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Attachment-3 (QR) ................................................................................................................................. 9
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(All the attachments need be edited as per Consortium in case of Joint venture, wherever applicable)
Attachment-3(JV)

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Joint Venture Agreement and Power of Attorney for Joint Venture*)

Bidder’s Name and Address: To: <Name and Address of Employer>

Dear Sir,

The Joint Venture Agreement (as per the proforma attached at no. 15 in Section-VI, Sample Forms and Procedures, Conditions of Contract, Vol.-I of the Bidding Documents) and Power of Attorney for Joint Venture (as per the proforma attached at no. 14 in Section-VI, Sample Forms and Procedures, Conditions of Contract, Vol.-I of the Bidding Documents) are enclosed herewith.

* Applicable for Joint Venture.

Date:....................

(Signature)............................................................

Place:....................

(Printed Name)......................................................

(Designation)......................................................

(Common Seal)....................................................
Attachment-3 (QR)

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Qualifying Requirement Data)

Bidders Name & Address:  
To  
<Name and Address of the Employer>

Dear Ladies and/or Gentlemen,

In support of the Qualification Requirements (QR) for bidders, stipulated in Annexure-A (BDS) of the Section - III (BDS), Volume-I & additional information required as per ITB clause 9.3(c) of the Bidding Documents, we furnish herewith our QR data/details/documents etc., alongwith other information, as follows (The QR stipulations have been reproduced in italics for ready reference, however, in case of any discrepancy the QR as given in BDS shall prevail).

* We have submitted bid as individual firm.

* We have submitted bid as joint venture of following firms:

(i) ..................................................................................................

(ii) ..................................................................................................

(iii) ..................................................................................................

(* Strike-off whichever is not applicable)

[For details regarding Qualification Requirements of a Joint Venture, please refer para 4.0 below.]

We are furnishing the following details/document in support of Qualifying requirement for the subject project.

A. Attached copies of original documents defining:

   a) The constitution or legal status;

   b) The principal place of business;

   c) The place of incorporation (for bidders who are corporations); or the place of registration and the nationality of the Owners (for applicants who are partnerships or individually-owned firms).

B. Attached original & copies of the following documents.
a) Written power of attorney of the signatory of the Bid to commit the bidder.
b) ** Joint Venture Agreement

[* To be submitted only in case of Joint Ventures. Strike off in case of individual firms.]

1.0 Pre-qualification criteria – Part A:

1.01 Technical:
The detailed criteria is mentioned at 1.01 of Annexure-A to BDS at Volume-I : Section-III.

**Format C: Format for the Bidder (Single Firm / Partner(s) in case of Joint Venture) for technical experience in compliance to para 1.01 (III) {(i) or (ii) or (iii)} of Annexure-A to BDS (Volume-I : Section-III) [In case of Joint Venture bidder, the QR data of each of the partner (in support of meeting the requirement of para 1.01 (III) (iv) of Annexure-A to BDS (Volume-I : Section-III)] is also is to furnished, as applicable, using this format. The bidder (Single Firm / Partner(s) in case of Joint Venture) who is willing to qualify in compliance to para 1.01 (III) {(ii) or (iii)} above shall fill below format for two or all three contracts.

<table>
<thead>
<tr>
<th>A1. Name of Bidder/Lead Partner of JV/other partner(s) of JV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A2. Name of Contract (executed during the last 7 years as on the originally scheduled date of bid opening):</td>
<td></td>
</tr>
<tr>
<td>A3. Contract Reference No. &amp; Date of Award</td>
<td></td>
</tr>
</tbody>
</table>
| A4 Name and Address of the Employer/Utility by whom the Contract was awarded | e-mail ID 
Telephone No. 
Fax No. |
| A5 Name of Project executed successfully -
  i. Work order Number & date (Consider PO which have Smart meters)
  ii. Work Start & Completion date (If currently ongoing then mention)
  iii. No. of Smart Meters with make and model number
  iv. Communication system with major component make & model
  v. Software/MDM module OEM & version |  |
vi. Name of system integrator, and make of utility legacy solution / consumer care & Billing system  

vii. Project location, Client Name, Contact person number & email  

viii. Reference bid document name, page number  

A7(i) Date of successful execution of the Contract/Date of commissioning  

No. of years the above referred works is in successful operation as on the date of bid opening  

A8. Capacity in which the Contract was undertaken (Check One)  

☐ Prime Contractor  

☐ Partner of JV  

☐ Subcontractor  

(Tick whichever is applicable)  

A9. Details/documentary evidence submitted in support of stated experience/Contract  

(Documentary evidence, such as copies of utility certificates etc., in support of its experience shall be attached with the filled-up format for each experience/Contract)  

1.02 Commercial  

The detailed criteria is mentioned at 1.02 of Annexure-A to BDS at Volume-I : Section-III.  

Format C: Format for the Bidder (Single Firm / Partner(s) in case of Joint Venture) for commercial experience in compliance to para 1.02.1 (i) of Annexure-A to BDS at Volume-I : Section-III [In case of Joint Venture bidder, the QR data of each of the partner (in support of meeting the requirement of para 1.02.5 of Annexure-A to BDS at Volume-I : Section-III] is also is to furnished, as applicable, using this format. The bidder (Single Firm / Partner(s) in case of Joint Venture) who is willing to qualify in compliance to para 1.02.1 {(ii) or (iii)} of Annexure-A to BDS at Volume-I : Section-III shall fill below format for two or all three contracts.  

A1. Name of Bidder/Lead Partner of JV/other partner(s) of JV  

A2. Name of Contract (executed during the last 5 years up to 31.03.2013):  

A3. Contract Reference No. & Date of Award  

A4 Name and Address of the Employer/Utility
### Format D: Format for the Bidder (Single Firm / Partner(s) in case of Joint Venture) for commercial experience in compliance to para 1.02.2, 1.02.3 & 1.02.4 of Annexure-A to BDS at Volume-I : Section-III [In case of Joint Venture bidder, the QR data of each of the partner (in support of meeting the requirement of para 1.02.5 of Annexure-A to BDS at Volume-I : Section-III] is also to furnished, as applicable, using this format.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1.</strong></td>
<td><strong>Name of Bidder/Lead Partner of JV/other partner(s) of JV</strong></td>
<td></td>
</tr>
<tr>
<td><strong>A2.</strong></td>
<td><strong>Net-worth in last three years</strong></td>
<td><strong>A3.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Financial Year 2012-13</strong></td>
<td>1. Financial Year 2010-11</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td>2. Financial Year 2011-12</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>3. Financial Year 2012-13</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>4. Financial Year 2013-14</td>
</tr>
</tbody>
</table>
5. Financial Year 2014-15

<table>
<thead>
<tr>
<th>A4</th>
<th>liquid assets (LA) and/or evidence of access to or availability of credit facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>: Rs. ----- lakhs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A4.</th>
<th>Details/documentary evidence submitted in support of stated experience/Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>: Rs. ----- lakhs</td>
</tr>
</tbody>
</table>

(Documentary evidence, such as copies of utility certificates etc., in support of its experience shall be attached with the filled-up format for each experience/Contract)

1.02.1 Failure to comply with this requirement will result in rejection of the joint venture’s bid. Sub contractors’ experience and resources shall not be taken into account in determining the bidder’s compliance with qualifying criteria.

1.02.2 One of the partners shall be nominated as lead partner, and the lead partner shall be authorized to incur liabilities and receive instruction for and on behalf of any and all partners of the joint venture and the entire execution of the contract including receipt of payment shall be done exclusively through the lead partner. This authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners as per proforma in section “Annexure” of Special Conditions of Contract-Vol.-IA.

1.02.3 All partner of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms and a copy of the agreement entered into by the joint venture partners having such a provision shall be submitted with the bid.

2.0 Pre-qualification criteria – Part B:

The Bidder shall also furnish following documents/details with its bid:

2.01.1 A certificate from banker (as per format) indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary Employer may make queries with the Bidders’ bankers.

2.01.2 The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.

2.01.3 Note:

2.01.3.1 In the event the bidder is not able to furnish the information of its own (i.e. separate), being a subsidiary company and its accounts are being consolidated with its group/holding/parent company, the bidder should submit the audited balance
sheets, income statements, other information pertaining to it only (not of its
group/Holding/Parent Company) duly certified by any one of the authority [(i)
Statutory Auditor of the bidder /(ii) Company Secretary of the bidder or (iii) A
certified Public Accountant] certifying that such information/documents are based on
the audited accounts as the case may be.

2.01.3.2 Similarly, if the bidder happens to be a Group/Holding/Parent Company, the bidder
should submit the above documents/information of its own (i.e. exclusive of its
subsidiaries) duly certified by any one of the authority mentioned in Note - 2.01.3.1
above certifying that these information/ documents are based on the audited
accounts, as the case may be.

2.01.4 Litigation History:

2.01.4.1 The bidder should provide detailed information on any litigation or arbitration arising
out of contracts completed or under execution by it over the last five years. A
consistent history of awards involving litigation against the Bidder or any partner of JV
may result in rejection of Bid.

2.01.4.2 Notwithstanding anything stated hereinabove, the Employer reserves the right to
assess the capacity and capability of the bidder, should the circumstances warrant
such assessment in an overall interest of the Employer. The Employer reserves the
right to waive minor deviations if they do not materially affect the capability of the
Bidder to perform the contract.
Attachment-4

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Form of Certificate of Origin and Eligibility)

Bidder’s Name and Address: To: XXXX (Name and Address of Employer)

We hereby certify that equipment and materials to be supplied are produced in ................................................................., an eligible source country.

We hereby certify that our company is incorporated and registered in ................................................................., an eligible source country.

Date:............... (Signature).............................................................

Place:............... (Printed Name)............................................................

(Designation)............................................................

(Common Seal)............................................................
**Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India**

**List of Special Maintenance Tools & Tackles**

Bidder’s Name and Address: To: XXXX (Name and Address of Employer)

Dear Sir,

We are furnishing below the list of special maintenance tools & tackles for various equipment under the subject project. The prices for these tools & tackles are included in our lumpsum bid price. We further confirm that the list of special maintenance tools & tackles includes all the items specifically identified in your bidding documents as brought out below:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>For Equipment</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
</table>

Notwithstanding what is stated above, we further confirm that any additional special maintenance tools and tackles, required for the equipment under this project shall be furnished by us at no extra cost to the employer.

Date:..................  
(Signature).................................................................

Place:.................. (Printed Name)........................................

(Designation).................................................................

(Common Seal)...............................................................
Attachment-4B

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(List of Special Maintenance Tools & Tackles)

Bidder’s Name and Address: 

To: XXXXX (Name and Address of Employer)

Dear Sir,

We are furnishing below the list of special maintenance tools & tackles for various equipment under the subject Project. The prices for these tools & tackles which are to be taken back after the completion of the work by us are not included in our lumpsum bid price. We further confirm that the list of special maintenance tools & tackles includes all the items specifically identified in your bidding documents as brought out below:

(a) ............................

(b) ............................

Date:.......................  

(Signature)..........................................................

Place:.......................  

(Printed Name)..................................................

(Designation)..................................................

/Common Seal).............................................
Attachment-5

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

Bidder’s Name and Address: 
To: XXXXX (Name and Address of Employer)

Dear Sir,

1.0 We hereby furnish the details of the items/sub-assemblies, we propose to buy for the purpose of furnishing and installation of the subject Project:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item Description</th>
<th>Quantity proposed to be bought/sub-contracted</th>
<th>Details of the proposed sub-contractor/sub-vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
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<td></td>
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<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.0 We hereby declare that, we would not subcontract the erection portion of the contract without the prior approval of Employer.

Date:...................  (Signature)...............................................
Place:...................  (Printed Name)............................................
                        (Designation)............................................
                        (Common Seal)............................................

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Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Alternative, Deviations and Exceptions to the Provisions)

Bidder's Name and Address:                    To: XXXXX (Name and Address of Employer)

Dear Sir,

The bidder shall itemize any deviation from the Specifications included in his bid. Each item shall be listed (separate sheets may be used and enclosed with this Attachment) with the following information:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Reference clause in the Specifications</th>
<th>Deviation</th>
<th>Cost of withdrawal of the deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The above deviations and variations are exhaustive. We confirm that we shall withdraw the deviations proposed by us at the cost of withdrawal indicated in this attachment, failing which our bid may be rejected and Bid Security forfeited.

Except for the above deviations and variations, the entire work shall be performed as per your specifications and documents. Further, we agree that any deviations, conditionality or reservation introduced in this Attachment-6 and/or in the Bid form, Price schedules & Technical Data Sheets and covering letter, or in any other part of the bid will be reviewed to conduct a determination of the substantial responsiveness of the bid.

Date:..........................  (Signature)...............................................
Place:.......................  (Printed Name)..............................................
                          (Designation)...........................................
                          (Common Seal)..........................................
Attachment-8

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Manufacturer’s Authorization Form)
(On Manufacturer’s Letterhead, see Clause 9.3(c) of the ITB)

To: [Insert: name of Employer]

Dear Ladies and/or Gentlemen,

WE [insert: name of Manufacturer] who are established and reputable manufacturers of [insert: name and/or description of the plant & equipment] having production facilities at [insert: address of factory] do hereby authorize [insert: name & address of Bidder] (hereinafter, the “Bidder”) to submit a bid, and subsequently negotiate and sign the Contract with you against IFB [insert: title and reference number of Invitation for Bids] including the above plant & equipment or other goods produced by us.

We hereby extend our full guarantee and warranty for the above specified plant & equipment materials or other goods offered supporting the supply, installation and achieving of Operational Acceptance of the plant by the Bidder against these Bidding Documents, and duly authorize said Bidder to act on our behalf in fulfilling these guarantee and warranty obligations. We also hereby declare that we and .............., [insert: name of the Bidder] have entered into a formal relationship in which, during the duration of the Contract (including warranty / defects liability) we, the Manufacturer or Producer, will make our technical and engineering staff fully available to the technical and engineering staff of the successful Bidder to assist that Bidder, on a reasonable and best effort basis, in the performance of all its obligations to the Purchaser under the Contract.

For and on behalf of the Manufacturer

Signed: _______________________________________________________________

Date: __________________________________

In the capacity of [insert: title of position or other appropriate designation] and this should be signed by a person having the power of attorney to legal bind the manufacturer.

Date:.......................  (Signature)...........................................

(Printed Name)...........................................…………

(Designation)...........................................

(Common Seal)...........................................

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Note 1. The letter of Undertaking should be on the letterhead of the Manufacturer and should be signed by a person competent and having Power of Attorney to legally bind the Manufacturer. It shall be included by the bidder in its bid.

2. Above undertaking shall be registered or notarized so as to be legally enforceable.
Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Work Completion Schedule)

Bidder’s Name and Address: To: XXXXX (Name and Address of Employer)

Dear Sir,

We hereby declare that the following Work Completion Schedule shall be followed by us in furnishing and installation of the subject Project for the period commencing from the effective date of Contract to us:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Work</th>
<th>Period in months from the effective date of Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Detailed Engineering and drawing submission</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Procurement of equipment/ components &amp; assembly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Type Tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Manufacturing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Shipments &amp; Delivery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Establishment of site office</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Work</th>
<th>Period in months from the effective date of Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Installation at Site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Testing &amp; Pre-commissioning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Trial Operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) completion</td>
<td></td>
</tr>
</tbody>
</table>

Date:.......................................................  (Signature):.........................................................
Place:........................................  (Printed Name):.........................................................
                        (Designation):.........................................................
                        (Common Seal):.........................................................

Note: Bidders to enclose a detailed network covering all the activities to be undertaken for completion of the project indicating key dates for various milestones for each phase constituent-wise.
Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Guarantee Declaration)

Bidder's Name and Address: To: XXXX (Name and Address of Employer)

Dear Sir,

We hereby declare that this Attachment of "Guarantee Declaration" is furnished by us in Packet-I of Inner Envelope-2 of bid envelope.

Date:.................... (Signature)...........................................................

Place:................... (Printed Name).....................................................

(Designation).................................................................

(Common Seal)........................................................................

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Attachment-11

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Information regarding Ex-employees of XXXXX (Name of Employer) in our Organisation)

Bidder's Name and Address: To: XXXXX (Name and Address of Employer)

Dear Sir,

We hereby furnish the details of ex-employees of XXXXX (Name of Employer) who had retired/ resigned at the level of XXXXX (Define suitable post) from XXXXX (Name of Employer) and subsequently have been employed by us:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the person with designation in XXXXX (Name of Employer)</th>
<th>Date of Retirement/ resignation from XXXXX (Name of Employer)</th>
<th>Date of joining and designation in our Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>.................................................................</td>
<td>.................................................................</td>
<td>.................................................................</td>
</tr>
<tr>
<td>2.</td>
<td>.................................................................</td>
<td>.................................................................</td>
<td>.................................................................</td>
</tr>
<tr>
<td>3.</td>
<td>.................................................................</td>
<td>.................................................................</td>
<td>.................................................................</td>
</tr>
<tr>
<td>4.</td>
<td>.................................................................</td>
<td>.................................................................</td>
<td>.................................................................</td>
</tr>
<tr>
<td>5.</td>
<td>.................................................................</td>
<td>.................................................................</td>
<td>.................................................................</td>
</tr>
</tbody>
</table>

Date: .................................................................

(Signature) .................................................................

Place: .................................................................

(Printed Name) .................................................................

(Designation) .................................................................

(Common Seal) .................................................................

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Note: The information in similar format should be furnished for each partner of joint venture in case of joint venture bid.
Attachment-12 – Not to be submitted
Attachment-14 PRECONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on day of the month of 2010, between, on one hand, the .......................... (Name of Owner) acting through Shri....... (Name and designation of Project Manager) (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s......... (Name of Bidder) represented by Shri , Chief Executive Officer (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a PSU/Utility/Department of State Govt. performing its functions on behalf of the .......................... (Name of owner).

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organisation or third party related to the
contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The BUYER will, during the pre-contract stage, treat all BIDDERs alike and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERs.

1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2.0 In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

**Commitments of BIDDERs**

3.0 The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organisation or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or for bearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or bearing to show favour or disfavour to any person in relation to the contract or any other contract with Government.

3.3 BIDDERs shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4 BIDDERs shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
3.5 The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorised government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.
4. **Previous Transgression**

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER’s exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. **Earnest Money (Security Deposit)**

5.1 While submitting commercial bid, the BIDDER shall deposit an amount......... (to be specified in RFP) as Earnest Money/Security Deposit, with the BUYER through any of the following instruments:

(i) Bank Draft or a Pay Order in favour of

(ii) A confirmed guarantee by an Indian Nationalised Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified in the RFP).

5.2 The Earnest Money/Security Deposit shall be valid upto a period of ..... years or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, whichever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. **Sanctions for Violations**

6.1 Any breach of the aforesaid provisions by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would
(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the UBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss 'or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(X) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this Pact also on the Commission by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.
7. Fall Clause

7.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

8. Independent Monitors

8.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.
9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at ............. on ................

BUYER
Name of the Officer
Designation
Deptt./PSU

BIDDER
CHIEF EXECUTIVE OFFICER

Witness
1.......................... 2..........................
2.......................... 3..........................

* Provisions of these clauses would need to be amended/ deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.
Attachment-15

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Option for Initial Advance (either Interest Bearing Initial Advance or No Initial Advance) and Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises)

Bidder’s Name and Address: To: XXXXX (Name and Address of Employer)

Dear Sir,

I. We have read the provisions in the Bidding Documents regarding furnishing the option for advance payment. Accordingly, as per ITB Clause 9.3 as provided in Section BDS, Section III, Vol.-I of the Bidding Documents, we hereby confirm to opt the following:

<table>
<thead>
<tr>
<th>Interest Bearing Initial Advance</th>
<th>Supply Portion</th>
<th>Installation Portion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes*</td>
<td>No*</td>
</tr>
<tr>
<td></td>
<td>Yes^</td>
<td>No^</td>
</tr>
</tbody>
</table>

(*^ tick ONLY ONE of the selected options)

II. We are furnishing the following details of Statutory Registration Numbers and details of Bank for electronic payment.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Name of the Supplier/Contractor in whose favour payment is to be made</td>
<td></td>
</tr>
<tr>
<td>2. Address with PIN Code and State</td>
<td>Registered Office:</td>
</tr>
<tr>
<td></td>
<td>Branch Office:</td>
</tr>
<tr>
<td></td>
<td>Correspondence Address:</td>
</tr>
<tr>
<td>3. Status – Company/others [Declaration of Micro/Small/Medium Enterprise</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>4.</td>
<td>Permanent Account (PAN) No.</td>
</tr>
<tr>
<td>5.</td>
<td>Central Sales Tax (CST) No.</td>
</tr>
<tr>
<td>8.</td>
<td>Service Tax Registration No.</td>
</tr>
<tr>
<td>9.</td>
<td>PF Registration No. of the Company</td>
</tr>
<tr>
<td>10.</td>
<td>PF Regional Office covered (with Address)</td>
</tr>
<tr>
<td>11.</td>
<td>Name of Contact Person</td>
</tr>
<tr>
<td>12.</td>
<td>Telephone No(s).</td>
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<td></td>
<td></td>
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<tr>
<td>13.</td>
<td>Bank Details for Electronic Payment</td>
</tr>
<tr>
<td></td>
<td>Name of the Bank:</td>
</tr>
<tr>
<td></td>
<td>Address of Branch:</td>
</tr>
<tr>
<td></td>
<td>Account No.:</td>
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<tr>
<td></td>
<td>Type of Account:</td>
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<tr>
<td></td>
<td>[ ] Saving</td>
</tr>
<tr>
<td></td>
<td>[ ] Current</td>
</tr>
<tr>
<td>14.</td>
<td>9 digit MICR code printed at bottom in middle, next to cheque no.</td>
</tr>
<tr>
<td>15.</td>
<td>IFSC (for RTGS)/NEFT Code (to be obtained from the Bank)</td>
</tr>
</tbody>
</table>
We hereby declare that the above information is true and correct and we agree that the payment on account of this Contract, in the event of award, be made in the above account maintained in the above mentioned Bank.

| Date:......................                     |
| (Signature)........................................................................|
| Place:......................                          |
| (Printed Name)..........................................................|
| (Designation).............................................................|
| (Common Seal)..............................................................|
Attachment-16

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Additional Information)

Bidder’s Name and Address: To: XXXXX (Name and Address of Employer)

Dear Sir,

In support of the additional information required as per ITB Sub-Clause 9.3 (p) of the Bidding Documents, we furnish herewith our data/details/documents etc., alongwith other information, as follows (the stipulations have been reproduced in italics for ready reference):

1.0 The Bidder shall furnish

A certificate from their Banker(s) (as per prescribed formats in Form 16, Volume-I:Section-VI: Sample Forms and Procedures) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders’ Bankers.[Reference ITB clause 9.3(p)(i)]

1.1 In accordance with 1.0, certificate(s) from banker as per requisite format, indicating various fund based/non fund based limits sanctioned to the bidder or each member of the joint venture and the extent of utilization as on date is/are enclosed, as per the following details:

<table>
<thead>
<tr>
<th>Name of the Bidder/partner of Joint Venture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the Banker by whom certificate issued</td>
<td></td>
</tr>
<tr>
<td>Date of certificate (should not be earlier than <strong>3 months</strong> prior to date of bid opening)</td>
<td></td>
</tr>
<tr>
<td>Whether fund based/non fund based limits are indicated in the certificate</td>
<td></td>
</tr>
<tr>
<td>Whether extent of utilization is indicated in the certificate</td>
<td></td>
</tr>
</tbody>
</table>

1.2 The Bidder should accordingly also provide the following information/documents (**In case of JV bidders, information should be provided separately for all the Partners of JV in the given format**):

(i) Details of Banker:
(ii) As per para 1.0, Authorization Letter(s) from the bidder (in case of JV bidder, from all the partners) addressed to the Banker(s), authorizing XXXXX *(Name of Employer)* to seek queries about the bidder with the Banker(s) and advising the Banker(s) to reply the same promptly, is/are enclosed as per following details:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Letter Ref.</th>
<th>Date</th>
<th>Addressed to (name of the Bank)</th>
</tr>
</thead>
</table>

2.0 **Litigation History**

*The bidder should provide detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of JV may result in rejection of Bid.* *[Reference ITB clause 9.3(p)(ii)]*

2.1 Details of litigation history resulting from Contracts completed or under execution by the bidder over the last five years

<table>
<thead>
<tr>
<th>Year</th>
<th>Name of client, cause of litigation/arbitration and matter in dispute</th>
<th>Details of Contract and date</th>
<th>Award for or against the bidder</th>
<th>Disputed amount</th>
</tr>
</thead>
</table>

3.0 **OTHER INFORMATION**

3.1 Current Contract Commitments of works in progress
Bidders (individual firms or each partners of JV) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

<table>
<thead>
<tr>
<th>Details of Contract</th>
<th>Value of outstanding work (Rs.)</th>
<th>Estimated completion date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2 Financial Data:

(In Rs. Millions)

<table>
<thead>
<tr>
<th>Actual (previous five years)</th>
<th>Projection for next five years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total Assets</td>
<td></td>
</tr>
<tr>
<td>2. Current Assets</td>
<td></td>
</tr>
<tr>
<td>3. Total Liability</td>
<td></td>
</tr>
<tr>
<td>4. Current Liability</td>
<td></td>
</tr>
<tr>
<td>5. Profit before taxes</td>
<td></td>
</tr>
<tr>
<td>6. Profit after taxes</td>
<td></td>
</tr>
</tbody>
</table>

4. The information/documentation in support of Bidder’s design infrastructure and erection facilities and capacity and procedures including quality control related to the work, are enclosed at ______ herewith.

5. The CV and experience details of a project manager with 15 years experience in executing such contract of comparable nature including not less than five years as manager and the CVs of other employees to be deputed for the subject work, are enclosed at ____ herewith.

Date:....................  (Signature) .....................................
Place:....................  (Printed Name) ..................................
                        (Designation) ..........................................
                        (Common Seal) .....................................
Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Declaration for tax exemptions, reductions, allowances or benefits)

Bidder's Name and Address: To: XXXXX (Name and Address of Employer)

Dear Sirs,

1. We confirm that we are solely responsible for obtaining following tax exemptions, reductions, allowances or benefits in respect of supplies under the subject Project, in case of award. We further confirm that we have considered the same in our bid thereby passing on the benefit to XXXXX (Name of Employer) while quoting our prices. In case of our failure to receive such benefits, partly or fully, for any reason whatsoever, the Employer will not compensate us.

2. We are furnishing the following information required by the Employer for issue of requisite certificate if and as permitted in terms of the applicable Govt. of India policies/procedures (in case of award):

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Applicable Act, Notification No. and Clause Ref. No.</th>
<th>Description of item on which applicable</th>
<th>Country of origin</th>
<th>Remarks, if any</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

(The requirements listed above are as per current Notification of Govt. of India indicated above. These may be modified, if necessary, in terms of the Notifications.)

Date:.......................... Signature:.................................................................

Place:.......................... (Printed Name):.........................................................

(Designation):..............................................................

(Common Seal):..............................................................
Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

(Declaration)

Bidder's Name and Address:  To: XXXXX (Name and Address of Employer)

Dear Sir,

We confirm that Bid Form have been filled up by us as per the provisions of the Instruction to Bidders. We have also uploaded price bid electronically as per the provisions of the Instruction to Bidders. Further, we have noted that the same shall be evaluated as per the provisions of the Bidding Documents.

Further, we hereby confirm that except as mentioned in the Attachment – 6 (Alternative, Deviations and Exceptions to the Provisions) hereof and/or the Covering Letter, forming part of our Bid Envelope:

(i) there are no discrepancies/inconsistencies and deviations/omissions/ reservations to the Bidding Documents, in the price bid;

(ii) the description of items and the unit thereof in the price schedules are in conformity with those indicated in the price schedule of the Bidding Documents without any deviation to the specified scope of work.

We also confirm that in case any discrepancies/ inconsistencies and deviations/ omissions/ reservations, as referred to in para (i) and (ii) above, is observed in the online price bid, the same shall be deemed as withdrawn/rectified without any financial implication, whatsoever to XXXXX (Name of Employer). However, in case of any arithmetical errors, the same shall be governed as per the provision of ITB Sub-Clause 27.2 read in conjunction with BDS.

Date:.................... (Signature)...................................................………..
Place:................... (Printed Name)....................................

(Designation)..............................................................
(Common Seal)..........................................

IPDS & PMRP /SBD/R1
Page 310 of 444
**Attachment-19**

**Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India**

*(Bank Guarantee verification Check list)*

Bidder's Name and Address:  To: XXXXX *(Name and Address of Employer)*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Checklist</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does the bank guarantee compare verbatim with standard proforma for BG?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(a)</td>
<td>Has the executing Officer of BG indicated his name designation &amp; Power of Attorney No. / Signing power Number etc. on BG?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(b)</td>
<td>Is each page of BG duly Signed/ initialed by the executants and last page is signed with full particulars as required in the standard proforma of BG and under the seal of the bank?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2(c)</td>
<td>Does the last page of the BG carry the signatures of two witnesses alongside the signature of the executing Bank Manager?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3(a)</td>
<td>Is the BG on non-judicial stamp paper of appropriate value?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3(b)</td>
<td>Is the date of sale of non-judicial stamp paper shown on the BG and the stamp paper is issued not more than Six months prior to the date of execution of BG?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4(a)</td>
<td>Are the factual details such as Bid specification No., LOA No. contract price, etc, correct?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4(b)</td>
<td>Whether Overwriting /cutting, if any on the BG, authenticated under signature &amp; seal of executants?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Is the amount and validity of BG is inline with contract provisions?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Whether the BG has been issued by a Nationalized bank / Non-Nationalized Bank acceptable to Buyer /Scheduled Bank in India (the applicability of the bank should be in line with the provisions of bidding documents)?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date:..................  (Signature)................................................... ………
Place:..................  (Printed Name).....................................................

(Designation)..........................................................
(Common Seal)......................................................
Attachment-20 Team Structure & Responsibilities

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

Bidder’s Name and Address: 

To: XXXXX (Name and Address of Employer)

I hereby declare to execute the project through undersigned agencies:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Role of Agency</th>
<th>Name of Agency</th>
<th>Whether Consortium/ Sub-contractor</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Meter Manufacturer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>System Integrator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>RF Communication Provider</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Attachment-21

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

In a bid to make our entire procurement process more fair and transparent, RECPDCL intends to use the reverse auctions as an integral part of the entire tendering process. All the bidders who are found as technically qualified based on the tender requirements shall be eligible to participate in the reverse auction event.

The following terms and conditions are accepted by the bidder on participation in the bid event:

1. RECPDCL shall provide the user id and password to the authorized representative of the bidder.

2. (Authorization Letter in lieu of the same shall be submitted along with the signed and stamped Acceptance Form).

3. RECPDCL decision to award the work would be final and binding on the supplier.

4. The bidder agrees to non-disclosure of trade information regarding the purchase, identity of RECPDCL, bid process, bid technology, bid documentation and bid details to any other party.

5. The bidder is advised to fully make aware themselves of auto bid process and ensure their participation in the event of reverse auction and failing to which RECPDCL will not be liable in any way.

6. In case of bidding through Internet medium, bidders are further advised to ensure availability of the infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitch, internet response issues, software or hardware hangs, power failure or any other reason shall not be the responsibility of RECPDCL.

7. In case of intranet medium, RECPDCL shall provide the infrastructure to bidders. Further, RECPDCL has sole discretion to extend or restart the auction event in case of any glitches in infrastructure observed which has restricted the bidders to submit the bids to ensure fair & transparent competitive bidding. In case an auction event is restarted, the best bid as already available in the system shall become the basis for determining start price of the new auction.

8. In case the bidder fails to participate in the auction event due any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid as submitted by the bidder as a part of the tender shall be considered as the bidder’s final no regret offer. Any offline price bids received from a bidder in lieu of non-participation in the auction event shall be out rightly rejected by RECPDCL.

9. The bidder shall be prepared with competitive price quotes on the day of the bidding event.

10. The prices as quoted by the bidder during the auction event shall be inclusive of all the applicable taxes, duties and levies and shall be FOR at site.

11. The prices submitted by a bidder during the auction event shall be binding on the bidder.

12. No requests for time extension of the auction event shall be considered by RECPDCL.

13. The original price bids of the bidders shall be reduced on pro-rata basis against each line item based on

14. the final all-inclusive prices offered during conclusion of the auction event for arriving at Contract amount.

Signature & Seal of the Bidder
Attachment-22

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

Technical Solution:

Approach & Methodology
VOLUME-II: SECTION – III

Price Schedules

Financial Bid
<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Miscellaneous item, if any</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td><strong>A.</strong> Application Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td><strong>B.</strong> Supply, Installation &amp; Commissioning of Network Equipments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.</td>
<td><strong>C.</strong> Supply, Installation &amp; Commissioning of Hardware for Application</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td><strong>D.</strong> Supply, Installation &amp; Commissioning of Hardware for Network Management</td>
<td></td>
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<tr>
<td>5.</td>
<td><strong>E.</strong> Removed Accessories</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6.</td>
<td><strong>F.</strong> Miscellaneous item</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7.</td>
<td><strong>G.</strong> Polycarbonate Seals for Meter Box as per Specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8.</td>
<td><strong>H.</strong> Meter Box (4:1) with Bus Bars, internal wiring of appropriate current rating &amp; termination caps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9.</td>
<td><strong>I.</strong> Meter Box (2:1) with Bus Bars, internal wiring of appropriate current rating &amp; termination caps</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td><strong>J.</strong> Service Cable Supply, Installation, Commissioning &amp; other services</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td><strong>K.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12.</td>
<td><strong>L.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<td></td>
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<tr>
<td>13.</td>
<td><strong>M.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>14.</td>
<td><strong>N.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>15.</td>
<td><strong>O.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>16.</td>
<td><strong>P.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>17.</td>
<td><strong>Q.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
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</tr>
<tr>
<td>18.</td>
<td><strong>R.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
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</tr>
<tr>
<td>19.</td>
<td><strong>S.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>20.</td>
<td><strong>T.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>21.</td>
<td><strong>U.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
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<tr>
<td>22.</td>
<td><strong>V.</strong> Supply, Installation, Commissioning &amp; other services</td>
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<tr>
<td>23.</td>
<td><strong>W.</strong> Supply, Installation, Commissioning &amp; other services</td>
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</tr>
<tr>
<td>24.</td>
<td><strong>X.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
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</tr>
<tr>
<td>25.</td>
<td><strong>Y.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
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</tr>
<tr>
<td>26.</td>
<td><strong>Z.</strong> Supply, Installation, Commissioning &amp; other services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- All quoted items are exclusive of all taxes & duties.
- Rates are subject to change without prior notice.
- Prices are valid only for the quantities specified herein.
- The rates are inclusive of packing, handling, and transportation charges.
- The quoted rates are considered final and are subject to the approval of the relevant authorities.
- The contractor shall ensure that all materials are of the quality and specifications agreed upon before the commencement of work.
- The contractor shall ensure that all work is carried out in accordance with the approved plans and specifications.
- The contractor shall ensure that all work is completed within the agreed time frame.
STANDARD BIDDING DOCUMENT
(FULL TURNKEY CONTRACT)
FOR

Turnkey Implementation of Advanced Metering Infrastructure for 9.25 Lakh consumers in different areas of Jammu & Kashmir with 5 years FMS including Operation & Maintenance, for Power Development Department (PDD) of Government of J&K under PMDP, IPDS & DDUGJY Schemes of Govt. of India

VOLUME-III

(TECHNICAL SPECIFICATIONS & DRAWINGS)

Section-I : Technical Specifications
Section-II : Indicative Tender Drawings
Section-I : Technical Specifications

i. Smart Meter
ii. MDM
iii. HES
iv. Server
v. Storage
vi. Firewall
vii. San switch
viii. Lan switch
ix. Router
x. Meter Box
xi. CMRI
xii. Polycarbonate Seal
xiii. TS Insulation Piercing Connectors
xiv. LT Cable

Section-II : Indicative Tender Drawings

i. Meter Box
ii. Meter Installations

The meter box and installation drawings are indicative. Bidder to submit the proposed design of meter boxes at the time of bidding.
Technical Specifications for Meter Box

1.1 SCOPE
This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site and performance of single phase meter box intended to contain one number single phase whole current energy meter complete with all accessories for trouble free and efficient operation.

The Meter box shall be pole-mounted.

1.2. APPLICABLE STANDARDS
The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest edition of the following Indian/international standards and shall conform to the regulations of the local statutory authorities.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Standard Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>IS:14772-2000</td>
<td>General requirements for Meter boxes for accessories for household and similar fixed electrical installations- specifications.</td>
</tr>
<tr>
<td>ii.</td>
<td>IS:11731(Part-II)-1992</td>
<td>Methods of test for determination of Flammability of solid electrical insulating material when exposed to an igniting source.</td>
</tr>
<tr>
<td>v.</td>
<td>IS:2500(Part-I)-2000</td>
<td>Sampling procedure for inspection by attributes part-I sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.</td>
</tr>
<tr>
<td>vi.</td>
<td>UL 746-C</td>
<td>Polymeric Materials in Electrical equipment.</td>
</tr>
</tbody>
</table>

1.3. GENERAL TECHNICAL REQUIREMENTS

PROPERTIES OF PLASTIC MATERIAL
The plastic material, which is to be used by the bidder for these moulded Meter Box, must have the following properties:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Property</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Physical Water Absorption</td>
<td>%</td>
<td>Max. 0.35</td>
</tr>
<tr>
<td>2.</td>
<td>Thermal HDT</td>
<td>Deg. C</td>
<td>Min. 125.</td>
</tr>
<tr>
<td>3.</td>
<td>Flammability</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Rating</td>
<td></td>
<td>FV2</td>
</tr>
<tr>
<td></td>
<td>b) Glow wire test @ 650 Deg. C</td>
<td></td>
<td>Passes</td>
</tr>
<tr>
<td>4.</td>
<td>Mechanical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Tensile Strength</td>
<td>MPA</td>
<td>Min. 50</td>
</tr>
<tr>
<td></td>
<td>b) Flexural strength</td>
<td>Mpa</td>
<td>Min. 90</td>
</tr>
<tr>
<td></td>
<td>c) Modulus of Elasticity</td>
<td>Mpa</td>
<td>Min. 2000</td>
</tr>
<tr>
<td></td>
<td>d) Izod impact strength notched 23°C.</td>
<td>KJ/Sq.m.</td>
<td>Min 8</td>
</tr>
</tbody>
</table>

Technical Requirements

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Application</td>
<td>Outdoor</td>
</tr>
<tr>
<td>ii.</td>
<td>Degree of protection</td>
<td>IP 55</td>
</tr>
<tr>
<td>iii.</td>
<td>Flammability requirement</td>
<td>FV2</td>
</tr>
</tbody>
</table>
iv. Grade of material | Polycarbonate with fire retardant, Self-Extinguishing, UV stabilized and anti-oxidation properties having good dielectric and mechanical strength.
---|---
v. Material | Meter box (base and Cover) shall be made of polycarbonate material which complies following properties:  
- Meter box shall be weather proof  
- Capable to withstanding temperatures of boiling water for 5 minutes continuously without distortion or softening.  
- It shall withstand Glow-wire test at 650DC as per IS:14772.

| a) Base: | Polycarbonate with fire retardant, Self-Extinguishing, UV stabilized and anti-oxidation properties having good dielectric and mechanical strength. Opaque. |
| b) Cover: | Polycarbonate with fire retardant, Self-Extinguishing, UV stabilized and anti-oxidation properties having good dielectric and mechanical strength. Transparent. |
vi. Material of the gasket | Rubber gasket |
vii. Material withstand | $125^\circ C \pm 2^\circ C$

### 1.4. GENERAL CONSTRUCTIONS:

i. The meter box shall be weather proof, tamper proof and shall be made of Injection moulded polycarbonate material with self-extinguishing, UV stabilized, recyclable and Anti oxidation properties having good dielectric and mechanical strength. The box shall be of adequate strength, unbreakable and shall be made in two pieces (base and cover). The base shall be opaque whereas the cover shall be completely transparent.

ii. The meter Box shall have roof tapering down to both the sides for easy flow of rainwater and shall have IP 55 degree of protection for affording protection against dust and water.

iii. The thickness of the box shall not be less than 3.0 mm on the load bearing side and other sides, door and roof shall not be less than 2.5 mm.

iv. The box shall be designed in such a way that there should be the following clearances between the meter and the Meter box:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameter</th>
<th>Minimum Clearance</th>
</tr>
</thead>
</table>
| i.     | Between Sides of the meter body and meter box  
(Excluding the flanges on the meter body for sealing screws.) | 30 mm |
| ii.    | Between the lower edge of the terminal block and the box | 70 mm |
| iii.   | Between the back of the meter and the meter box base | 10 mm |
| iv.    | Between the front of the meter and the meter box front | 10 mm |
| v.     | Between the top of the meter and the meter box cover | 20 mm |

v. The meter base supports inside the box should have adequate strong enough moulded supports within the block to avoid damage during tightening of screws and raised by about 10 mm in the box for ease of wiring. While fixing, the meter screws should not protrude outside.

vi. The design of the meter box shall be such that it may facilitate easy wiring and access to the meter terminals. Suitable circular holes shall be provided at the bottom of the cupboard for inlet & outlet cables with glands of size 15/16mm suitable for 2 core armored aluminum cable(s) up to 6 Sq.mm made of engineering plastic for the cable securely fixed to the bottom of the meter box on both sides by chuck-nuts. A suitable arrangement like clamping nut may be provided with the gland so that opening diameter can be reduced to the size of cable.
vii. The box cover shall be fixed to the base through two number hinges (approx. length 30 - 60 mm). The arrangement for hinges shall be provided on the side of the base and shall be such that it may avoid unauthorized access to inside of the box. Hinges should be outside and enclosed by polycarbonate material and once the box is closed and sealed, hinges should not be approachable. Box cover shall be openable by more than 90 degrees.

viii. For holding and sealing the box, two U-shaped latches shall be provided. The latch shall be GI sheet with minimum thickness 2 mm, to secure it with the base of the box. The latch shall be provided along with suitable clamp assembly in base as well as cover, such that these are fully covered by the latch after closing. The clamp along with the latch shall have a sealing hole such as to provide a through sealing arrangement in the assembly.

ix. For fixing the box to flat wall or wooden board 4Nos. holes (2Nos. key holes at top) of minimum 6 mm dia. shall be provided at the four corners of the meter box. For fixing of Box on flat wall, 4 Nos. 5mm diameter 40mm long, pan head self-taping screws and washers shall be provided by the supplier with every Box. 4 Nos. plastic fixing plugs of 50mm length suitable for self-tapping screws shall also be provided.

x. The meter is to be installed in the Meter Box and the Meter Box in assembled condition shall have provision to fix it to a pole or on wall.

xi. A provision in form of depression should be provided on the meter box cover to download the meter data from the meter using the CMRI probe without opening the meter box cover. This shall be provided in such a way that the optical probe of the CMRI cable can be placed on top of the meter box cover in a suitable depression in the meter box cover, which is aligned suitably with the meter optical port. The meter box cover shall have provision of sealing this depression. The depression so provided should be covered so that there is no physical access to the meter optical port while using this depression.

xii. Suitable rubber gasket of round shape all around the cover along its periphery shall be provided for protection.

xiii. After closing and sealing the meter box, it should not be possible to allow entry of any sharp object even forcefully inside the box without breaking base/cover.

xiv. Suitable overlapping (approx. 10 mm) shall be provided between base and cover to avoid access to the meter or its accessories inside the meter box by any means after sealing the box.

xv. The tolerance permissible in overall dimension of Meter Box shall be ± 2 %.

**Meter Body Material:**

Base body and top cover shall be made of UV stabilized, unbreakable high grade flame retardant insulating material of good dielectric and mechanical strength with FV2/V2 in-flammability level.

**Terminal Block:**

a) The terminal block shall be moulded type made of non-hygroscopic, flame-retardant material having good dielectric and mechanical strength.

b) The moulded terminal block shall be made from best quality phenol formaldehyde/Poly carbonate conforming to IS:13779-1999 (latest amended) having adequate insulating properties and mechanical strength with brass inserts for connecting terminals.

c) The terminal block should satisfy all the conditions specified in IS:13779 and IEC 62052 - 11. The material of the terminal block should fulfil the requirement of following tests:

- The flame retardant rating of V0 as per UL 94 testing.
- The glow wire test for temperature of 960OC. as per IS:11000 (Part 2/Sec.1) or IEC 60695-2-1.
- Heat deflection temperature (HDT) test of 135OC. as per ISO 75 or ASTM D-648
- Ball pressure test at 125OC. as per IEC 60335-1.

Other details remains the same as mentioned in the original tender.
1. SMART METERS AND AMI IMPLEMENTATION

Meters
Bidder to supply following type of Smart Meters as per mentioned BoQ.

<table>
<thead>
<tr>
<th>Type of Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Single phase whole current Smart Meter</td>
</tr>
<tr>
<td>2. Three Phase whole current Smart Meter</td>
</tr>
</tbody>
</table>

1. SINGLE PHASE WHOLE CURRENT SMART METER

1.1. SCOPE

This specification covers the technical requirements of design, manufacturing, testing & integration with network integration card (NIC) of RF communication or any other technology to be used at JKPDD for LT Single phase two Wire, 10-60 A and 5-30 A static smart meters of accuracy class 1.0 (here after referred as meters) complete with all accessories for efficient and trouble free operation. It is not the intent to specify completely herein all the details of technical design and construction of material. However, the material shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in manner acceptable to the purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment is not in accordance therewith.

The offered material shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of Bidder’s supply irrespective of whether those are specifically brought out in this specification and/or the commercial order or not.

1.2. APPLICABLE STANDARDS

The equipment covered by this specification shall conform to the requirements stated in latest editions & amendments of relevant Indian/ IEC Standards and shall conform to the regulations of local statutory authorities.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>IS 16444 (with latest amendment) : 2015, 2017</td>
</tr>
<tr>
<td>b</td>
<td>IS 13779 : 1999</td>
</tr>
<tr>
<td>c</td>
<td>IS 15884 : 2010</td>
</tr>
<tr>
<td>d</td>
<td>IS 15959 Part-1 : 2011</td>
</tr>
<tr>
<td>e</td>
<td>IS 15959 Part 2 : 2016</td>
</tr>
<tr>
<td>f</td>
<td>IEEE 802.15.4 : 2016</td>
</tr>
<tr>
<td>g</td>
<td>IS 9000</td>
</tr>
<tr>
<td>h</td>
<td>IEC 62052-11 : 2003</td>
</tr>
<tr>
<td>i</td>
<td>IEC 62053-21 : 2003</td>
</tr>
<tr>
<td>j</td>
<td>IS 15707 : 2006</td>
</tr>
<tr>
<td>k</td>
<td>IEC 60068</td>
</tr>
</tbody>
</table>

A.C. Static Direct connected Watt hour Smart meter class 1.0 and 2.0
A.C. Static Watt hour meter class 1.0 and 2.0
A.C. direct connected static prepayment meters for active energy (class 1 & 2)
Data exchange for electricity meter reading, tariff and load control
Data exchange for electricity meter reading, tariff and load control
Standard for local and metropolitan area networks
Basic Environmental testing procedure for electrical and electronic items.
Electricity Requirements (AC) General Requirements Tests and Test conditions for A.C. Static Watt hour meter for active energy Class 1.0 and 2.0.
A.C. Static Watt hour meter for active energy Class 1.0 and 2.0
Testing Evaluation installation and maintenance of AC Electricity Meters-Code of practice.
Environmental testing.
1.3. CLIMATE CONDITIONS OF THE INSTALLATION

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameters</th>
<th>Specified Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maximum Ambient temperature</td>
<td>50°C</td>
</tr>
<tr>
<td>2.</td>
<td>Yearly average temperature</td>
<td>32°C</td>
</tr>
<tr>
<td>3.</td>
<td>Daily average temperature</td>
<td>42°C</td>
</tr>
<tr>
<td>4.</td>
<td>Minimum temperature</td>
<td>-30°C</td>
</tr>
<tr>
<td>5.</td>
<td>Height above sea level</td>
<td>1500 Mtrs.</td>
</tr>
<tr>
<td>6.</td>
<td>Max. relative humidity</td>
<td>100%</td>
</tr>
<tr>
<td>7.</td>
<td>Min. relative humidity</td>
<td>10%</td>
</tr>
<tr>
<td>8.</td>
<td>Average No. of thunder storm days per year</td>
<td>54 days</td>
</tr>
<tr>
<td>9.</td>
<td>Average rainfall</td>
<td>118 cm</td>
</tr>
<tr>
<td>10.</td>
<td>Max. wind pressure</td>
<td>130 kgs/ m2</td>
</tr>
<tr>
<td>11.</td>
<td>Average number of rainy days per year</td>
<td>106 days</td>
</tr>
</tbody>
</table>

1.4. GENERAL TECHNICAL REQUIREMENTS

1.4.1. Type of the meter

Single phase two wire, static watt-hour direct connected type smart meter without application of any Multiplication Constant. It consisting of measuring element(s), time of use of register(s), display, load switch and plug in type bi-directional communication module all integral with the meter housing.

1.4.2. Accuracy Class of the meter

Accuracy Class of the smart meter should be 1.0

1.4.3. Basic Current (Ib) & rated Maximum current (Imax)

a) 10-60 Amp (80% of total quantity)

b) 5-30 Amp (20% of total quantity)

(Meter shall be able to continuously carry 120% of Imax Meeting the accuracy requirements).

1.4.4. Reference Conditions for testing the performance of the meter

a) \( V_{\text{ref}} = 240 \, \text{V} \pm 1\% \)

b) Frequency \( = 50 \, \text{Hz} \pm 0.3\% \)

c) Temperature \( = 27 \, \text{C} \pm 2^\circ \text{C} \)

1.4.5. Operating Voltage

Meter shall be operational with required accuracy from 0.6 \( V_{\text{ref}} \) to 1.2 \( V_{\text{ref}} \). However, meter shall withstand the maximum system Voltage of 440V (for minimum 5 min).

1.4.6. Operating Frequency

Required operating frequency should be in the range of 50 Hz ± 5%.
1.4.7. Power Consumption

Power consumption of the smart meter with integrated communication modules and load control switch shall be as per IS 16444 (Part 1)

1.4.8. Starting Current

20mA (0.2% of Ib) (phase or neutral current)

1.4.9. Short time over current

1800 A for 0.01 sec (30 Imax for one half cycle at Rated frequency)

1.4.10. Influence of heating

Temperature rise at any point of the external surface of the meter shall not exceed by more than 20K with an ambient temperature at 50°C.

1.4.11. Rated Impulse Withstand voltage

6KV (shall be applied ten times with one polarity and then repeated with the other polarity.)

1.4.12. AC withstand Voltage

4 KV for 1 Minute Minimum

1.4.13. Minimum Insulation resistance

Minimum Insulation resistance at test voltage 500+/- 50 V dc

   a) Between frame & current, voltage circuits as well as auxiliary circuits connected together: 5 M Ohm
   b) Between each current (or voltage circuit) & each and every other circuit.: 50 M Ohm

1.4.14. Mechanical requirements

Meter shall be in compliance with clause 12.3 of IS 13779

1.4.15. Resistance to heat and fire

The terminal block and Meter case shall ensure safety against the spread of fire. These should not get ignited by thermal overload of live parts in contact with them as per clause 6.8 of IS 13779. Fire retardant material shall be used.

1.4.16. Protection against penetration of dust and water

Degree of protection: IP 51 as per IS 12063, but without suction in the meter. Meter shall comply with clause 6.9 and 12.5 of IS 13779

1.4.17. Resistance against Climatic influence

Meter shall be in compliance with clause 12.6 of IS 13779.

1.4.18. Electromagnetic Compatibility (EMC)

Meter shall be in compliance with clause 4.5 and 5.5 of IS 15884
**1.4.19. Accuracy requirements**

Meter shall be in compliance with clause 11 of IS 13779.

**1.4.20. Power factor range**

Zero lag to Zero lead.

**1.4.21. Energy measurement**

Fundamental energy + Energy due to Harmonics

**1.4.22. Connection Diagram**

The connection diagram for the system shall be provided on terminal cover.

**1.4.23. Self-Diagnostic feature**

The meter shall have indications for unsatisfactory / non-functioning of:

a) Real Time Clock  
b) RTC battery  
c) Non Volatile Memory  
d) NIC card

**1.4.24. Initial start-up of meter**

Meter shall be fully functional within 5 secs after reference voltage is applied to the meter terminals.

**1.4.25. Alternate mode of supply to the meters**

In case of meter damage, reading/data should be retrieved with the help of battery or other power source. (Bidder to provide free of cost 04 nos of jig for retrieving data from memory of meter. Jig should be such that NVM can be push fit on this jig and data can be retrieve from this NVM).

**1.4.26. Terminal Specs**

a) Minimum Internal Diameter of the terminal holes 9.5mm (minimum)  
b) Clearance between adjacent terminals 10 mm (minimum)

**1.4.27. Display**

Backlit LCD, Scrolling, 10 seconds for each parameter minimum 6+1 digits LCD display

**1.4.28. Security feature**

Programmable facility to restrict the access to the information recorded at different security level such as read communication, write communication, firmware selection from remote etc.

**1.4.29. Software and communication compatibility**

The bidder shall supply software required for local (CMRI) & remote (AMI) connectivity including required training to use the software free of cost. In case solution is given on RF, RF enabled portable device should be provided which will communicate with meter on RF and will communicate with DCU/HES on RF/GPRS.

**1.4.30. Calibration**
Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However, parameters like RTC, TOD tariff, DIP (billing & load survey), billing date, display parameters etc. shall be reconfigure through CMRI and remotely over the air (OTA).

1.4.31. Communication module of meter for AMI

Meter shall have suitable arrangement for RF/ GPRS based NIC cards for remote communication as per the requirements of AMI as mentioned in CEA guideline and IS 16444. NIC card shall be replaceable type with proper sealing arrangement with meter. Meter shall have functionality to record the event along with date & time of module replacement/ removal from the meter.

1.4.32. Communication Layer Protocol

Should be as per clause 9.3 of IS 16444 (with latest amendment)

1.4.33. Key Management and Security Feature

Should be as per IS 15959 Part-1 & Part-2

1.4.34. Usage Application

Indoor and Outdoor usage

1.4.35. Disconnector

The meter shall have the facility of disconnecting and re-connecting the load of the meter from the remote and by authenticated command through Laptop/HHU at site by means of a built-in contactor. Each operation of the switches shall be logged by the meter as an event with date and time stamp and reading parameters. This operation should be in line with clause 11 of IS 16444 (with latest amendment), however over current tripping should be disabled by default. The cumulative no. of such operations shall also be made available.

The make of the load switch should be of reputed make like Gruner (German), KG Technologies or equivalent and same shall be confirmed by the bidder during tendering. Switch shall be in compliance to IS 15884.

The brief technical particulars of this Disconnector / load switch are furnished below: -

<table>
<thead>
<tr>
<th>S.No.</th>
<th>DESCRIPTION</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operating Voltage range</td>
<td>120 V to 470 V</td>
</tr>
<tr>
<td>2</td>
<td>Operating Current range</td>
<td>20 mA to 72 A</td>
</tr>
<tr>
<td>3</td>
<td>Maximum switching power</td>
<td>22 kVA per phase/ per IS 15884 Annex G</td>
</tr>
<tr>
<td>4</td>
<td>No. of poles</td>
<td>2 nos (one in phase and one in neutral)</td>
</tr>
<tr>
<td>5</td>
<td>Operation of switches</td>
<td>Simultaneous</td>
</tr>
<tr>
<td>6</td>
<td>Utilization Categories</td>
<td>As per IS16444</td>
</tr>
<tr>
<td>7</td>
<td>Min. number of operation</td>
<td>3000 (close, open each)</td>
</tr>
</tbody>
</table>

1.4.36. Communication capabilities and software feasibilities

a) The meter shall have facilities for data transfer locally through CMRI (Using optical port/NIC card) and remotely by GPRS/3G/4G/RF Mesh with proper security via Plug in type NIC. 

b) It should be the responsibility of the bidder to ensure integration of meter into HES (Supplied by communication provider) of existing communication network system of JKPDD, (if Exists).
c) It shall be possible to reconfigure the meters for RTC, TOD Tariff, DIP (Demand Integration period), billing date, display parameters etc. through proper authentication process locally through CMRI and remotely Over the Air (OTA). Necessary keys if required for performing this reconfiguration operation should also be provided along with supply of meter lot & training to RECPDCL/JKPDD staff on how to use it free of cost. Bidder to provide this support on a later stage also on the request of RECPDCL/JKPDD without any cost implication.

d) Optical Communication port shall be available for communication. Communication ports shall not be affected by any type of injection / unauthenticated signals and having proper sealing arrangement. The complete data shall be downloaded within 5 minutes.

e) The bidder shall supply software required for local (CMRI) & remote (AMI) connectivity including required training to use the software free of cost. Bidder shall provide the communication protocol / APIs for communication with meter through local (CMRI) / remote (AMI) as and when required by RECPDCL/JKPDD free of cost during life time of meter. The bidder should provide DLMS compliance for Communication with the meter at Optical port and at HES.

f) Bidder should also provide software for changing firmware of meters in mass and should support integration of this software with HES. Bidder should also provide base computer software (BCS) for viewing the data downloaded through HES/CMRI/laptop/HHU in separate PC/laptop. Android based/windows/linux based HHU shall be preferred. API required for converting raw file to XML (DLMS/OBIS) should also be provided if applicable.

g) For purpose of exercising control, like outage management, the meter should send abnormalities at the consumers’ end like Power failure (Last Gasp), Power Restoration (First Breath). Additional exceptional events should also be communicated to HES by meter immediately after the occurrence through RF / RF Mesh. It should also indicate the restoration of the same event. List of events to be reported should be configurable Over the Air (OTA). List will be decided during blue Printing stage. The meter should have "Last Gasp" and "First Breath" feature to facilitate sending alerts to the HES during fully powered off / On condition.

h) Two way communications between:
   a. Base Station (HES) and Data Concentrator Unit (DCU) shall be through GPRS/3G/4G/RF/Fiber/Ethernet or any other suitable media, depending upon suitability and choice of RECPDCL/JKPDD.
   b. Meter and Intermediated Communication Network Elements (if Exists) and/or Data Concentrator Unit through RF/Hybrid (GPRS/3G/4G/RF/Fiber).
   c. Intermediated Communication Network Elements (if Exists) and Data Concentrator Unit (if different & if applicable) through RF/Hybrid (GPRS/3G/4G/RF/Fiber).

i) Last mile mesh network must support auto-registration and self-healing feature to continue operation using easiest possible available route in case of failure of any communication device in the mesh.

j) Meter Serial no will be used for tagging of all data of the meters in all database (at HES / MDM/ DCU level etc.). However, it will be the responsibility of the Bidder to establish the complete communication solution involving all the meters in the system. Also, the Bidder must ensure that, the mode of communication used for RF shall be consistent with the Government of India stipulations.

k) Integration of meter software’s with HES / MDMS for seamless transfer of data will be in scope of bidder till the expiry of warranty of the meters. It is desired firmware up gradation/selection should be available over the air.

l) Bidder has to ensure that meter supplied by him will be compatible with RF/GPRS solution and HES/MDMS supplied by him.

m) Communication of the meter at optical port /OTA (NAN/WAN) should be as per IS 15959 (Part-2):2016.

n) Communication network should be immune with any external Magnetic field/ESD/Jammer/HV voltage influence such that it shall not affect the normal overall functionality.

o) Meter once powered up with NIC card should be self-detected (First Breath) by communication network and its basic name plate details & current readings should be transferred to HES.
RTC of all the meters and network elements installed shall be synchronized with server. The maximum drift of one (1) minute shall be permitted. All components shall support standard RTC synchronization methods. Bidder need to provide detailed architecture and process used for same after award of contract. RTC synchronization process shall not affect the general functionality and SLA requirements. Meters shall have log in memory as an event of RTC synchronization along with date & time and drift. Although meter RTC shall not get drifted by more than 3 minutes in a year, if no synchronization process performed.

1.4.37. Immunity against external influencing signals

a) Magnetic Field:
Meter shall comply magnetic immunity as per CBIP report 325 or latest amendment. Meter shall log magnet event in memory and shall record at Imax during magnetic influence.

b) Electrostatic Discharge (ESD)
Meter shall comply ESD immunity as per CBIP report 325 or latest amendment. Meter shall immune or log ESD event in memory. In any case meter recording shall not be affected due to influence of ESD signal. Meter shall withstand and record accurately upto 35kV ESD signals.

1.4.38. Neutral Disturbance & other tampers

a) The meter shall log the event in memory on thresholds (Shall be submitted by Bidder after award of contract for approval) in Table 4 - Tamper Event Details for Single Phase Smart Meters.

b) The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse up to 330V (both + & - DC) and for any value beyond this.

c) Tamper Icon in LCD shall glow for presence of meter top cover open case.

1.4.39. Abnormal Tamper conditions

All tamper logging thresholds values shall be configurable from remotes.

<table>
<thead>
<tr>
<th>Table 4 - Tamper Event Details for Single Phase Smart Meters</th>
</tr>
</thead>
</table>
| **1** | **Current Related** | a. Occurrence and restoration of following current related events shall be logged in meter memory as per table A5 of IS 15959 (Part 2).  
|       |                   | b. For each occurrence event captured, the cumulative tamper count shall be incremented.  
|       |                   | c. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).  |
| **2** | **Earth Tamper**  | a. Whenever a Meter should log earth tamper. Continuous indication through LED flag or icon on display shall be provided for this tamper.  |
| **3** | **Power related** | a. Occurrence and restoration of following Power related events shall be logged in meter memory as per table A6 of IS 15959 (Part 2).  
|       |                   | b. Only Real clock (date and time) and event code shall be captured.  
|       |                   | c. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).  |
| **4** | **Power On/ Off** | Meter shall detect occurrence and restoration of power off if the phase voltage is absent more than a threshold period of time. |
| **5** | **Voltage related** | a. Occurrence and restoration of following Voltage related events shall be logged in meter memory.  
<p>|       |                   | d. For each occurrence event captured, the cumulative tamper count shall be incremented.  |
| <strong>6</strong> | <strong>Low Voltage Logging</strong> | Event shall be logged in memory along with Occurrence and restoration event data. Threshold should be below 180 Volts. Manufacturer should explain behavior of meter below 120V.  |
| <strong>7</strong> | <strong>Protection against HV spark</strong> | Meter shall continue to record energy or log the event, in case it is disturbed externally using a spark gun/ ignition coil. Upto 35 KV meter should remain immune. Communication port shall also be immune upto 35KV with cover in place. The Meter shall comply to HV spark when Meter installed in Meter Box.  |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **8** | **Others** | a. Occurrence and restoration of following events shall be logged in meter memory as per table A8 of IS 15959 (Part 2).  
b. For each occurrence event captured, the cumulative tamper count shall be incremented.  
c. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1). |
| **9** | **Neutral disturbance** | Meter shall log all events when AC/DC/ Pulsating voltage is injected in neutral circuit especially when same can disturb the recording of energy. Manufacturer should specify the method of testing of Neutral disturbance. |
| **10** | **External Magnetic Interference** | a. The meter shall either remain immune to tamper through application of external magnetic field (AC electro magnet or DC magnet) as per value specified in CBIIP 325 or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F as per CBIIP 325 and same should also be logged as event with date & time.  
b. In case of abnormal permanent magnetic field, either meter shall remain immune or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F and it should also be logged as event with date & time.  
c. The meter shall be provided with built in log/ indication and sensor to detect tamper beyond meter’s magnetic immunity level and display of such occurrences. The meter accuracy or accuracy display shall not be affected by permanent magnetic field up to meter’s magnetic immunity level.  
d. At the time of occurrence of magnetic tamper, meter should record tamper event with Imax, rated voltage and unity P.F and at the time of restoration it should logged with actual parameters. Manufacturer should explain method of MD computation during magnetic interference. |
| **11** | **Single wire power** | Meter should get disconnected by the load switch to avoid load drawn in above condition. |
| **12** | **Non rollover events** | a. Occurrence of following non rollover events shall be logged in meter memory as per table A9 of IS 15959 (Part 2).  
b. For each occurrence event captured, the cumulative tamper count shall be incremented.  
c. For these events only date and time shall be captured.  
d. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1). |
<p>| <strong>13</strong> | <strong>Top cover open</strong> | Meter shall have top cover open detection and same shall be logged. Detection and logging mechanism shall work even when the meter is de-energized. Logic shall be defined. |
| <strong>14</strong> | <strong>Connection Related Tamper Conditions</strong> | The meter shall not get affected by any remote control device &amp; shall continue recording energy under any one or combinations of the following conditions: |
| <strong>15</strong> | <strong>I/C &amp; O/G Interchanged</strong> | Meter should record forward energy within limits of accuracy class 1.0. |
| <strong>16</strong> | <strong>Phase &amp; Neutral Interchanged</strong> | Meter should record forward energy within limits of accuracy class 1.0. |
| <strong>17</strong> | <strong>I/C (Phase &amp; Neutral) Interchanged, Load Connected To Earth.</strong> | Meter should record forward energy within limits of accuracy class 1.0. |
| <strong>18</strong> | <strong>I/C Neutral Disconnected,</strong> | Meter should get disconnected through the load switch to avoid load drawn in above condition. |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>O/G Neutral &amp; Load Connected To Earth.</strong></td>
<td></td>
</tr>
<tr>
<td>I/C Neutral Disconnected, O/G Neutral Connected To Earth Through Resistor &amp; Load Connected To Earth.</td>
<td>Meter should disconnected the load switch to avoid load drawn in above condition</td>
</tr>
<tr>
<td>I/C Neutral Connected, O/G Neutral Connected To Earth Through Resistor &amp; Load Connected To Earth.</td>
<td>Meter should record forward energy</td>
</tr>
<tr>
<td><strong>Event Logging</strong></td>
<td>Total number of events to be stored shall be minimum 20 for power On/ OFF event and not more than 50 for all other events in FIFO basis.</td>
</tr>
<tr>
<td><strong>Parameter Snapshot</strong></td>
<td>Captured parameters mentioned above are to be captured when event occurrence and restoration is logged as per table A11 of IS 15959 (Part 2).</td>
</tr>
<tr>
<td></td>
<td>i. Date and time of event</td>
</tr>
<tr>
<td></td>
<td>ii. Event code</td>
</tr>
<tr>
<td></td>
<td>iii. Current - instantaneous current of the element (Phase or Neutral) used for energy consumption.</td>
</tr>
<tr>
<td></td>
<td>iv. Voltage</td>
</tr>
<tr>
<td></td>
<td>v. Power factor</td>
</tr>
<tr>
<td></td>
<td>vi. Cumulative energy- kWh</td>
</tr>
<tr>
<td><strong>Tamper Indication</strong></td>
<td>Appropriate Indications/Icons for all tampers should appear on the meter display either continuously or in auto display mode.</td>
</tr>
<tr>
<td><strong>Tamper Logics</strong></td>
<td>A logic sheet for tamper/ event detection and logging shall be submitted for purchaser’s approval. Following details should be provided for each tamper in tabular form</td>
</tr>
<tr>
<td></td>
<td>a. Detailed Tamper logic</td>
</tr>
<tr>
<td></td>
<td>b. Threshold values</td>
</tr>
<tr>
<td></td>
<td>c. Persistence times</td>
</tr>
<tr>
<td></td>
<td>d. Restoration time</td>
</tr>
<tr>
<td></td>
<td>e. Event count</td>
</tr>
</tbody>
</table>

### 1.5. GENERAL CONSTRUCTION REQUIREMENT

The Meter shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal conditions, so as to ensure especially personal safety against electric shock, safety against effect of excessive temperature, protection against spread of fire, protection against penetration of solid objects, dust and water.

All parts, which are subject to corrosion under normal working conditions, shall be protected effectively. Any protective coating shall not be liable to damage by ordinary handling or damage due to exposure to air, under normal working conditions.

The meters shall be designed and manufactured using SMT (Surface Mount Technology) components.
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 as given below or any other equivalent make with the strict approval of Purchaser:

The bidder is also required to furnish details as per the table mentioned below.

<table>
<thead>
<tr>
<th>S No</th>
<th>Component Function</th>
<th>Requirement</th>
<th>Makes and Origin (to be provided by bidder at the time of detailed engineering)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Measurement/computing chips</td>
<td>The Measurement/computing chips used in the meter should be with the Surface mount type along with the ASICs</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Memory chips</td>
<td>The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Display modules</td>
<td>The display modules should be well protected from the external UV radiations. The display visibility should be sufficient to read the meter mounted between height of 0.5m and 2m. The construction of the modules should be such that the displayed quantity should not disturbed with the life of display. (Pin Type) It should be trans-reflective STN type industrial grade with extended temperature range.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Optical port</td>
<td>Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>P.C.B.</td>
<td>Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Electronic components</td>
<td>The active &amp; passive components should be of the surface mount type &amp; are to be handled &amp; soldered by the state of art assembly processes.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Battery</td>
<td>Lithium with guaranteed life of 15 years</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>RTC / Micro controller</td>
<td>The accuracy of RTC shall be as per relevant IEC / IS standards</td>
<td></td>
</tr>
</tbody>
</table>

1.5.1. **Meter Body**

a) Base body and top cover shall be made of UV stabilized, unbreakable high grade flame retardant insulating material of good dielectric and mechanical strength with FV2/V2 inflammability level.
b) Base body shall be opaque.
c) Top cover shall be transparent or opaque/translucent with viewing window.
d) Usage of equivalent material shall be with prior approval of JKPDD.
e) Top cover and base should be fixed in such a manner that it shall be break to open/ultrasonically welded/Chemically Welded.
f) Meter body shall be sealed in such a way that opening of meter base and cover is not possible without breaking the seals.
g) Thickness of meter body (Base and Terminal cover) shall be 2mm minimum.

1.5.2. **Terminals, Terminal Block**

a) Terminals shall be suitable for 25 Sq. mm aluminium cable.
b) Two no’s flat head screws and washers per terminal shall be provided.

c) Material of terminals, screws and washers should be brass or tinned copper. Terminals shall be tested for continuous current of 120 % Imax.

d) Terminals shall be clearly marked for phase / neutral / outgoing etc. this marking shall appear in the connection diagram.

e) Clearances and creep age shall be as per IS 13779.

f) The terminals and connections shall be suitable to carry up to 120 % of Imax continuously.

g) The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating.

h) The terminal arrangement in terminal block, shall be suitable and easily fixed at any test bench for testing purpose.

i) The terminal block shall be moulded type made of non-hygroscopic, flame-retardant material having good dielectric and mechanical strength.

j) The moulded terminal block shall be made from best quality phenol formaldehyde/Poly carbonate conforming to IS:13779-1999 (latest amended) having adequate insulating properties and mechanical strength with brass inserts for connecting terminals.

k) The terminal block should satisfy all the conditions specified in IS:13779 and IEC 62052 - 11. The material of the terminal block should fulfil the requirement of following tests:

l) The flame retardant rating of V0 as per UL 94 testing.

m) The glow wire test for temperature of 960OC. as per IS:11000 (Part 2/Sec.1) or IEC 60695-2-1.

n) Heat deflection temperature (HDT) test of 135OC. as per ISO 75 or ASTM D-648

o) Ball pressure test at 125OC. as per IEC 60335-1.

p) Terminal block shall be opaque.

q) Usage of equivalent material shall be with prior approval of JKPDD.

r) Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135OC and pressure of 1.8MPa.

s) The terminals shall be designed so as to ensure adequate and durable contact such that there is no risk of loosening or undue heating.

t) Terminal block shall be such that the risk of corrosion due to contact with other metal part is minimized.

u) Electrical connections shall be designed such that contact pressure is not transmitted through insulating material.

1.5.3. Terminal Cover

a) Material - UV stabilized transparent polycarbonate cover

b) Provision of sealing at one point through sealing screw.

c) The sealing screws shall be held captive in the terminal cover.

d) The meter shall be supplied with extended terminal block cover (ETBC). The ETBC shall be extended by minimum 50mm below plane surface of the terminal block with suitable sealing arrangement of terminal cover for providing numbered double anchor polycarbonate lash wire seal, which shall be supplied loose by the bidder as per technical specification of Polycarbonate Seals.

e) The terminal cover of the meter should be hinged either at the top or left side so that it opens from bottom to top or hinged at the left side so that it opens from right to left of the meter.

f) Terminal cover should have provision for cable entry from bottom.

g) Terminal cover shall have sufficient space for incoming and outgoing cable such that these can pass without stressing and damaging the terminal cover.

h) Diagram of external connections should be embossed on clearly on inside portion of terminal cover. Meter terminals shall also be marked and this marking shall appear in the above diagram. Stickers of any kind will not be accepted.

1.5.4. Sealing of meter

Reliable sealing arrangement shall be provided to make the meter tamper evident and to avoid fiddling or tampering by unauthorized persons. For this, one no. Polycarbonate seal and one no. Hologram seal shall be provided by the Purchaser. One no polycarbonate seal and one no. hologram seal shall be provided by the bidder. All the seals shall be fixed on meter body by the bidder at his works before dispatch.
One sealing provision shall be provided at meter terminal cover; such that terminal shall not be accessible without breaking the seals. All the seals shall be provided on front side only and as per the Purchaser specification. Rear side sealing arrangement shall not be accepted. Bidder shall provide seals be as per CEA regulation (2006). Only patented seals to be used as per CEA requirements. Plug in type NIC card should have proper sealing arrangement.
1.5.5. Screws

All electrically live screws shall be of brass/nickel tin-plated. All other screws shall be electro plated.

1.6. TOD FEATURE

Meter shall support ToD functionality as per IS 16444. ToD timings shall be provided at the time of detailed engineering.

1.7. MD INTEGRATION

The MD integration period shall be 30 minutes (integration period-programmable by CMRI at site and also through AMR with adequate security level). The MD resetting shall be automatic at the 1st of the month i.e. 0000 hours of 1st day of the month. Manual MD reset button shall not be available. Last six MD values shall be stored in the memory and one to be displayed in the Auto scroll mode. MD shall be recorded and displayed with minimum three digits before decimal and minimum two digits after decimal points.

1.8. DOWNLOADABLE PARAMETER for HES/BCS/MDM

The parameters in BCS shall be as under

1.8.1. Load Survey

The meter shall be capable of recording load profile of 45 days 30 min IP. Meter shall be capable of recording daily Energy and Demand 00:00 to 24:00 Hrs. Parameter to capture for load survey and daily profile shall be in line with IS 15959 part 2

1.8.2. Instantaneous Parameters

Meter shall be capable for following Instantaneous Parameters in Memory and should be available in BCS. Parameter to capture for instantaneous profile shall be in line with IS 15959 part 2

1.8.3. General Information

Meter shall be capable for providing below mentioned general parameters in memory

- Meter Serial number
- Software Name
- Version
- Manufacture Name
- Manufacture Year
- Meter Type
- Meter Class
- Meter Constant
- Meter Voltage Rating
- Meter Current Rating
1.8.4. Billing Parameters

Billing profile shall be in accordance to IS 15959 Part 2

1.8.5. Transactions

All the changes in software of meter to be logged along with date & time stamp and readings. Meter should do billing if any transaction is done.

1.8.6. Tamper Events

All the events should be logged as per Table 4 - Tamper Event Details for Single Phase Smart Meters.

1.8.7. Display Units

The display unit shall be Pin type built-in liquid crystal display (Permanently backlit type LCD). The LCD shall be of STN (Super Twisted Nematic) construction suitable for maximum temperature withstands 65°C and minimum temperature withstands -25°C during normal operating condition. The LCD display shall have a wide viewing angle of 120 degrees. When the meter is not energized the electronic display need not be visible. The display shall not be affected by electrical, magnetic disturbances and ESD. The display should be readable in direct sunlight. Phase Indication shall be provided via LED/ Icon on LCD.

1.8.8. Auto Scroll mode

Persistence time for each parameter shall be 10 second. Values followed by header shall be avoided. (i.e. if MD1 is displayed in Auto scroll mode, Header (MD1) and value (say 5.23 KW) shall be shown simultaneously; it shall not be shown in successive displays. Off time shall not be available in auto scroll mode between each cycle. Auto scroll mode is restored after 10 secs, if push button is not operated.

Display should not be stuck for any tamper events. Meter shall have proper indication for communication and network status i.e. NIC has joined NW or out of Network or signal strength and other diagnosis parameters.

Following shall be continuously displayed in auto scroll and push button mode in the given order.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Auto Scroll Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCD CHECK</td>
</tr>
<tr>
<td>2</td>
<td>Meter Sr. No. (Serial nos in single shot is preferred)</td>
</tr>
<tr>
<td>3</td>
<td>d- dd:mm:yy</td>
</tr>
<tr>
<td>4</td>
<td>t- hh:mm:ss</td>
</tr>
<tr>
<td>5</td>
<td>C   000000 KWh</td>
</tr>
<tr>
<td>6</td>
<td>000.000 Pr MD KW (Current month MD)</td>
</tr>
<tr>
<td>7</td>
<td>(Last month reading) 000000 KWh</td>
</tr>
<tr>
<td>8</td>
<td>(Last month MD) 000.000 MD KW</td>
</tr>
<tr>
<td>9</td>
<td>Ph  00.000 A</td>
</tr>
<tr>
<td>10</td>
<td>N   00.000A</td>
</tr>
<tr>
<td>11</td>
<td>000.000 V</td>
</tr>
<tr>
<td>12</td>
<td>Status of load switch(Connect or disconnect)</td>
</tr>
</tbody>
</table>

1.8.9. Push Button Scroll mode

Should facilitate following order
## Table 7

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Push Button Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCD CHECK</td>
</tr>
<tr>
<td>2</td>
<td>Meter Sr. No. (Serial no. in single shot is preferred)</td>
</tr>
<tr>
<td>3</td>
<td>d- dd:mm:yy</td>
</tr>
<tr>
<td>4</td>
<td>t- hh:mm:ss</td>
</tr>
<tr>
<td>5</td>
<td>C 000000 Kwh</td>
</tr>
<tr>
<td>6</td>
<td>000.000 Pr MD KW (Current month MD)</td>
</tr>
<tr>
<td>7</td>
<td>(Last month reading) A 000000 KWh</td>
</tr>
<tr>
<td>8</td>
<td>(Last month MD) A 000.000 MD KW</td>
</tr>
<tr>
<td>9</td>
<td>Ph 00.000 A</td>
</tr>
<tr>
<td>10</td>
<td>N 00.000A</td>
</tr>
<tr>
<td>11</td>
<td>000.000 V</td>
</tr>
<tr>
<td>12</td>
<td>Ph 00.000 KW</td>
</tr>
<tr>
<td>13</td>
<td>N 00.000 KW</td>
</tr>
<tr>
<td>14</td>
<td>Status of load switch (Connect or disconnect)</td>
</tr>
<tr>
<td>15</td>
<td>MAG 00 (cumulative count)</td>
</tr>
<tr>
<td>15a</td>
<td>Date of last occurrence</td>
</tr>
<tr>
<td>15b</td>
<td>Time of last occurrence</td>
</tr>
<tr>
<td>16</td>
<td>ESD 00 (cumulative count)</td>
</tr>
<tr>
<td>16a</td>
<td>Date of last occurrence</td>
</tr>
<tr>
<td>16b</td>
<td>Time of last occurrence</td>
</tr>
<tr>
<td>17</td>
<td>ND 00 (cumulative count)</td>
</tr>
<tr>
<td>17a</td>
<td>Date of last occurrence</td>
</tr>
<tr>
<td>17b</td>
<td>Time of last occurrence</td>
</tr>
<tr>
<td>18</td>
<td>SW 00 (cumulative count)</td>
</tr>
<tr>
<td>18a</td>
<td>Date of last occurrence</td>
</tr>
<tr>
<td>18b</td>
<td>Time of last occurrence</td>
</tr>
<tr>
<td>19</td>
<td>TC OPEN 00 (cumulative count)</td>
</tr>
<tr>
<td>19a</td>
<td>First occurrence date</td>
</tr>
<tr>
<td>19b</td>
<td>First occurrence time</td>
</tr>
<tr>
<td>20</td>
<td>Total tamper count 0000</td>
</tr>
<tr>
<td>21</td>
<td>Reading in high resolution</td>
</tr>
<tr>
<td>22</td>
<td>Count of connect</td>
</tr>
<tr>
<td>22a</td>
<td>Date and time of last occurrence</td>
</tr>
<tr>
<td>23</td>
<td>Count of disconnect</td>
</tr>
<tr>
<td>23a</td>
<td>Date and time of last occurrence</td>
</tr>
<tr>
<td>24</td>
<td>Meter FW Version</td>
</tr>
</tbody>
</table>

All these parameters shall be downloaded locally or remotely and interpreted in PC/Laptop. All the parameters shall be recorded and memorized in its Non Volatile Memory (NVM). The corresponding non-volatile memory shall have a minimum retention time of 10 years. Last twelve months’ history data (KWh reading and MD and event as above with date and time) shall be available in the Non Volatile Memory.
1.8.10. Output Device

a) **Pulse Rate**: The meters shall have a suitable test output device. Red color blinking LED (marked as imp/kWh) shall be provided in the front. This device shall be suitable for using with sensing probe used with test benches or reference standard meters. The test output device shall have constant pulse rate of (preferred value- 3200) pulse / kWh. Meter constant shall be indelibly printed on the name plate as (preferred value- 3200) imp / KWh

b) **EL LCD Indicator**: The meter shall be provided with suitable earth mark indicator for Earth Leakage. The EL Indicator shall glow when there is a difference of 6.25 % between phase and neutral current.

c) **Communication LCD indicator**: The meter shall be provided with suitable LCD indication for communication in progress.

d) **Load Switch LCD indicator**: The meter shall be provided with suitable LCD indication for condition of load switch (Close/open). LCD should show when load switch is open.

e) **Phase Indicator**: The meter shall be provided with suitable LCD/ LED indication for phase availability.

1.8.11. Mid Night Values

Meter should have mid night log for KWh for last 45 days.

1.8.12. Name Plate and Marking

Meters shall have a name plate clearly visible and effectively secured against removal. The base color of Name plate shall be as of RECPDCL/JKPDD approval, indelibly and distinctly marked with all essential particulars as per relevant standards along with the following.

- Manufacturer’s name
- Type designation
- Number of phases and wires
- Serial number (Meter serial number shall be laser printed on name plate instead on sticker).
- Month and Year of manufacture
- Unit of measurement
- Reference voltage, frequency
- Ref. temperature if different from 27 deg. C
- Rated basic and maximum Current
- Meter constant (imp/kWh)
- ‘BIS’ Mark
- Class index of meter
- “Smart Meter Implementation by REC Power Distribution Company Ltd.”
- “Property of JKPDD”
- Purchase Order No. & date
- Guarantee period
- Rated frequency
- Sign of double square
- Country of manufacture
- Symbol of load switch
- Communication Tech for WAN and NAN (with carrier frequency)
- Firmware version for meter (Optional)
- Category

The above details to be laser printed on meter top cover.

However, the following shall be printed in bar code on the meter nameplate. (Shall be printed on name plate instead on sticker).

- Manufacturer’s code No. (given by JKPDD)
- Meter Sr. No.
- JKPDD Property
- Month/Year of manufacture.
1.9. TESTS

All routine, acceptance & type tests shall be carried out on the meter and meter body separately in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted in addition to the tests specified in IS/IEC.

1.9.1. Type Test

(b) Test against abnormal magnetic influence as per CBIP TR 325.
(c) DC immunity test (injection both on phase and neutral terminal) Test for Material used for Terminal Block and meter body as per relevant standards.
(d) IP test

1.9.2. ROUTINE TEST

(a) AC High Voltage test
(b) Insulation test
(c) Test on limits of error
(d) Test of starting current
(e) Test of no load condition

1.9.3. ACCEPTANCE TEST

(a) AC High Voltage test
(b) Insulation test
(c) Test on limits of error
(d) Test of meter constant
(e) Test of starting current
(f) Test of no load condition
(g) Test of repeatability of error.
(h) Test of power consumption.
(i) Test for Immunity against external influencing signal as per the Purchaser specification
(j) Test for Immunity against DC Immunity as per the Purchaser specification
(k) Test for Immunity against Tamper conditions as per the Purchaser specification
(l) Error measurements with 38 abnormal condition
(m) Test to Influence of Harmonics
(n) Supply voltage and frequency variation test
(o) Testing of self-diagnostic features and tamper count increment and logging with date and time.
(p) All tests as defined in IS15959(Part-2): 2016

1.9.4. TYPE TEST CERTIFICATE

The bidder shall furnish the type test certificates of the meter for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI as per the relevant standards. For communication testing any national approved laboratory or international acclaimed lab or equivalent will also suffice at the discretion of JKPDD. Type test should have been conducted in certified Test Laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test
reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to JKPDD.

1.9.5. PRE-DISPATCH INSPECTION

The successful bidder shall facilitate the pre-dispatch inspection at their works site. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Bidder shall grant free access to the places of manufacture to JKPDD’s/RECPDCL representatives at all times when the work is in progress. Inspection by the JKPDD/RECPDCL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by JKPDD/RECPDCL.

Following documents shall be sent along with material.

a. Govt certified/accredited lab testing certificate
b. Meter Test reports
c. MDCC issued by JKPDD
d. Invoice in duplicate
e. Packing list
f. Drawings & catalogue
g. Guarantee / Warranty card
h. Delivery Challan
i. Other Documents (as applicable)
j. One no. leaflet with each meter

1.10. INSPECTION AFTER RECEIPT AT STORE

The material received at Purchaser’s store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection.

1.11. GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a period of at least 60 months from the date of commissioning or 66 months from the date of supply made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Company, failing which the purchaser will be at liberty to get it replaced/rectified at bidder’s risks and costs and recover all such expenses plus the Company’s own charges (@ 20% of expenses incurred), from the bidder or from the “Security cum Performance Deposit” as the case may be.

Bidder shall further be responsible for ‘free replacement at site’ for another period of THREE years from the end of the guarantee period for any ‘Latent Defects’ if noticed and reported by the purchaser.

1.12. PACKING

(a) Bidder shall ensure that all material covered under this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The material used for packing shall be environmentally friendly. Packing and transportation shall be as per IS 15707:206 clauses 9.1 and 9.2.

(b) Individual meter should be packed in separate box. Routine test report of the individual meter shall be kept inside each card board carton of the meter.

(c) On back side of RTC the bidder shall print a picture of the meter with its small details like for consumer to know about meter.
1.13. QUALITY CONTROL

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished.

Quality should be ensured at the following stages:

(a) At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.
(b) At insertion stage, all components should undergo computerized testing for conforming to design parameter and orientation.
(c) Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipment (ATEs).
(d) Prior to final testing and calibration, sample meters shall be subjected to aging test (i.e. meters will be kept in ovens for 24 hours at 55 Deg. C temperature and atmospheric humidity under real-life condition at its full load current. After 24 hours’ meter should work satisfactorily)

The JKPDD's engineer or its nominated representative shall have free access to the bidder's/manufacturer's works to carry out inspections. Intimation for tests should be given to JKPDD.

1.14. MINIMUM TESTING FACILITIES

Bidder should ensure that supplier of meter should have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards/JKPDD specification. The bidder shall have duly calibrated Reference Standard meter of Class 0.1 or better accuracy or better.

1.15. MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

1.16. SPARES, ACCESSORIES AND TOOLS

As applicable shall be furnished by the bidder.

1.17. DRAWINGS AND DOCUMENTS

Following drawings & Documents shall be prepared based on JKPDD specifications and statutory requirements and shall be submitted with the bid:

(a) Completely filled-in Technical Parameters.
(b) General arrangement drawing of the meter
(c) Terminal Block dimensional drawing
(d) Mounting arrangement drawings
(e) General description of the equipment and all components with makes and technical requirement.
(f) Type Test Certificates
(g) Experience List
(h) Manufacturing schedule and test schedule
After the award of the contract, four (4) copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>For Approval</th>
<th>For Review Information</th>
<th>Final Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Technical Parameters</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>General Arrangement drawings</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Terminal block Dimensional drawings</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Mounting arrangement drawing</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Manual/Catalogues</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Transport/ Shipping dimension drawing</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>QA &amp; QC Plan</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Routine, Acceptance and Type Test</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Bidder shall subsequently provide Four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to JKPDD.

All the documents & drawings shall be in English language.

**Instruction Manuals:** Bidder shall furnish two softcopies (CD) and four (4) hard copies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

**1.18. GUARANTEED TECHNICAL PARTICULARS**
Bidder must ensure to furnish following GTP along with bid submission.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description</th>
<th>Units</th>
<th>As Furnished by Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type of meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Accuracy Class of the meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ib &amp; Imax</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>a. Operating Voltage for meter</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Operating Voltage with communication unit functionality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Operating Frequency</td>
<td>Hz</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Power Consumption and Burden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Starting Current</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Short time over current</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Influence of heating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Rated impulse withstand voltage</td>
<td>KV</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>AC withstand Voltage for 1 min</td>
<td>KV</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Insulation resistance</td>
<td>M ohm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Between frame &amp;Current, voltage circuits connected together:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Between each current (or voltage circuit) &amp; each and every other circuit.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td>---------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Mechanical requirement as per IS 13779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Resistance to heat and fire (As per specification)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Degree of protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Resistance against climatic influence (as per IS 13779)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Electromagnetic Compatibility (EMC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Accuracy requirements (As per IS 13779)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Power factor range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Energy measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Connection Diagram for system on terminal cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Self-diagnostic feature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Initial startup of meter (meter shall be fully functional within 5 sec after reference voltage is applied to the meter terminals)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Terminal block</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Depth of the Terminal holes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Internal diameter of terminal holes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Clearance between adjacent terminals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Communication capabilities as per clause 1.4.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Immunity against abnormal Magnetic influence, as defined in Clause 1.4.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Immunity against ESD as defined in clause 1.4.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>DC Immunity as defined in clause 1.4.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Abnormal and tamper Conditions as per Table 4 - Tamper Event Details for Single Phase Smart Meters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Grade of material for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Meter base</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Meter cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Terminal block</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Terminal cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Tamper counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Recording forward energy in all conditions as per Annexure - 1 (including current/potential reversal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Makes of all components used in the meter to be provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Non Volatile memory (Retention period)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Measuring elements used in the meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Power supply to circuit in case of supply failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Display of measured values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>LCD display (Type and viewing angle)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Pulse rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Name plate marking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Routine test certificates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Acceptance test certificates</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yes/No
43 | Type test certificates | Yes/No |
44 | Guarantee certificates | Yes/No |
45 | Output Device (LEDs) As per clause Error! Reference source not found. | Yes/No |
46 | Make of Disconnector switch | |
47 | Disconnector Technical particular as per Specification clause 1.4.35 | Yes/No |
48 | Terminal Screw dia. | |
49 | Allen Screw head size (Terminal Screw) | |
50 | Fire retardant category of the material  
  a. Meter body  
  b. Terminal block | |

1.19. **SCHEDULE OF DEVIATIONS**
Bidders must submit any deviation as per the Form IV format.
2. THREE PHASE WHOLE CURRENT METERS

2.1. Scope

This specification covers the technical requirements of design, manufacturing, testing & integration with network integration card (NIC) of RF communication to be used at JKPDD for three phase four Wire, 3x230 voltage, 20-100A, whole current static smart meters of accuracy class 1.0 (hereafter referred as meters) complete with all accessories for efficient and trouble free operation.

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

2.2. APPLICABLE STANDARDS

The equipment covered by this specification shall conform to the requirements stated in latest editions & amendments of relevant Indian/IEC Standards and shall conform to the regulations of local statutory authorities.

Table 10 - Applicable Standards - Three Phase Smart Meters

<table>
<thead>
<tr>
<th></th>
<th>Standard Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>IS 16444 (with latest amendment) 2017</td>
<td>A.C. Static Direct connected Watt hour Smart meter class 1.0 and 2.0</td>
</tr>
<tr>
<td>b</td>
<td>IS 13779 : 1999</td>
<td>A.C. Static Watt hour meter class 1.0 and 2.0</td>
</tr>
<tr>
<td>c</td>
<td>IS 15884 : 2010</td>
<td>A.C. direct connected static prepayment meters for active energy (class 1 &amp; 2)</td>
</tr>
<tr>
<td>d</td>
<td>IS 15959 Part-1 : 2011</td>
<td>Data exchange for electricity meter reading, tariff and load control</td>
</tr>
<tr>
<td>e</td>
<td>IS 15959 Part 2 : 2016</td>
<td>Data exchange for electricity meter reading, tariff and load control</td>
</tr>
<tr>
<td>f</td>
<td>IEEE 802.15.4 : 2016</td>
<td>Standard for local and metropolitan area networks</td>
</tr>
<tr>
<td>g</td>
<td>IS 9000</td>
<td>Basic Environmental testing procedure for electrical and electronic items.</td>
</tr>
<tr>
<td>h</td>
<td>IEC 62052-11 : 2003</td>
<td>Electricity Requirements (AC) General Requirements Tests and Test conditions for A.C. Static Watt hour meter for active energy Class 1.0 and 2.0.</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>i</td>
<td>IEC 62053-21 : 2003</td>
<td>A.C. Static Watt hour meter for active energy Class 1.0 and 2.0</td>
</tr>
<tr>
<td>k</td>
<td>IEC 60068</td>
<td>Environmental testing.</td>
</tr>
<tr>
<td>l</td>
<td>CBIP–TR No.325</td>
<td>Specification for A.C. Static Electrical Energy Meters (latest amendment)</td>
</tr>
<tr>
<td>m</td>
<td>CEA Regulation : 2006</td>
<td>Installation and operation of meters Dated: 17/03/2006 or latest amendment</td>
</tr>
<tr>
<td>n</td>
<td>IS 16444: (with latest amendment)</td>
<td>A.C. Static Transformer Operated, Watthour and Var-Hour Smart Meters, Class 0.2S, 0.5S and 1.0S</td>
</tr>
<tr>
<td>o</td>
<td>CEA</td>
<td>Functional Requirements of Advanced Metering Infrastructure (AMI) In India ( AUG 2016) or latest amendment</td>
</tr>
</tbody>
</table>

### 2.3. CLIMATE CONDITIONS OF THE INSTALLATION

#### Table 11

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameters</th>
<th>Specified Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maximum Ambient temperature</td>
<td>50 °C</td>
</tr>
<tr>
<td>2.</td>
<td>Yearly average temperature</td>
<td>32 °C</td>
</tr>
<tr>
<td>3.</td>
<td>Daily average temperature</td>
<td>42 °C</td>
</tr>
<tr>
<td>4.</td>
<td>Minimum temperature</td>
<td>-25 °C</td>
</tr>
<tr>
<td>5.</td>
<td>Height above sea level</td>
<td>1500 Mtrs.</td>
</tr>
<tr>
<td>6.</td>
<td>Max. relative humidity</td>
<td>100%</td>
</tr>
<tr>
<td>7.</td>
<td>Min. relative humidity</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>-----------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>8.</td>
<td>Average No. of thunder storm days per year</td>
<td>54 days</td>
</tr>
<tr>
<td>9.</td>
<td>Average rainfall</td>
<td>118 cm</td>
</tr>
<tr>
<td>10.</td>
<td>Max. wind pressure</td>
<td>130 kgs/ m²</td>
</tr>
<tr>
<td>11.</td>
<td>Average number of rainy days per year</td>
<td>106 days</td>
</tr>
</tbody>
</table>

2.4. GENERAL TECHNICAL REQUIREMENTS

2.4.1. Type of the meter

Three phase 04 wire, static watt-hour direct connected type smart meter without application of any Multiplication Constant. It consisting of measuring elements(s), time of use of register(s), display, load switch and plug in type bi-directional communication module all integral with the meter housing.

2.4.2. Accuracy Class of the meter

Accuracy Class of the smart meter should be 1.0

2.4.3. Basic Current (Ib) & rated Maximum current (Imax)

(a) \(I_b = 20 \text{ Amp} \);
(b) \(I_{\text{max}} = 100 \text{ Amps} \);

(Meter shall be able to continuously carry 120% of Imax Meeting the accuracy requirements).

2.4.4. Reference Conditions for testing the performance of the meter

(a) \(V_{\text{ref}} = 240 \text{ V} \pm 1\% \)
(b) Frequency \(= 50 \text{ Hz} \pm 0.3\% \)
(c) Temperature \(= 27 \text{ C} \pm 2^\circ\text{C} \)

2.4.5. Operating Voltage

Meter shall be operational with required accuracy from 0.6 \(V_{\text{ref}} \) to 1.2 \(V_{\text{ref}} \). However, meter shall withstand the maximum system Voltage of 440V (for minimum 5 min).

2.4.6. Operating Frequency

Required operating frequency should be in the range of 50 Hz \(\pm 5\% \).

2.4.7. Power Consumption

Power consumption of the smart meter with integrated communication modules and load control switch shall be as per IS 16444 (Part 1)

2.4.8. Starting Current
40mA (0.2% of Ib) (phase or neutral current)

2.4.9. **Short time over current**

3000 A for 0.01 sec (30 Imax for one half cycle at Rated frequency)

2.4.10. **Influence of heating**

Temperature rise at any point of the external surface of the meter shall not exceed by more than 20K with an ambient temperature at 500 C.

2.4.11. **Rated Impulse Withstand voltage**

6KV (shall be applied ten times with one polarity and then repeated with the other polarity.)

2.4.12. **AC withstand Voltage**

4 KV for 1 Minute Minimum

2.4.13. **Minimum Insulation resistance**

Minimum Insulation resistance at test voltage 500+/- 50 V dc

(a) Between frame & current, voltage circuits as well as auxiliary circuits connected together: 5 M Ohm
(b) Between each current (or voltage circuit) & each and every other circuit.: 50 M Ohm

2.4.14. **Mechanical requirements**

Meter shall be in compliance with clause 12.3 of IS 13779

2.4.15. **Resistance to heat and fire**

The terminal block and Meter case shall ensure safety against the spread of fire. These should not get ignited by thermal overload of live parts in contact with them as per clause 6.8 of IS 13779. Fire retardant material shall be used.

2.4.16. **Protection against penetration of dust and water**

Degree of protection: IP51 as per IS 12063, but without suction in the meter. Meter shall comply with clause 6.9 and 12.5 of IS 13779

2.4.17. **Resistance against Climatic influence**

Meter shall be in compliance with clause 12.6 of IS 13779.

2.4.18. **Electromagnetic Compatibility (EMC)**

Meter shall be in compliance with clause 4.5 and 5.5 of IS 15884

2.4.19. **Accuracy requirements**

Meter shall be in compliance with clause 11 of IS 13779.

2.4.20. **Power factor range**
Zero lag to Zero lead. & meter shall be programmed at default lag only configuration i.e. Lead to be treated as unity for kVA calculations

2.4.21. Energy measurement

Fundamental energy + Energy due to Harmonics (Forward Metering for Import mode and Import / Export for Net configuration)

2.4.22. Connection Diagram

The connection diagram for the system shall be provided on terminal cover.

2.4.23. Self-Diagnostic feature

The meter shall have indications for unsatisfactory /non-functioning of

(a) Real Time Clock  
(b) RTC battery  
(c) Non Volatile Memory  
(d) NIC card

2.4.24. Initial start-up of meter

Meter shall be fully functional within 5 secs after reference voltage is applied to the meter terminals.

2.4.25. Alternate mode of supply to the meters

In case of meter damage, reading/data should be retrieved with the help of battery or other power source. (Bidder to be provide free of cost 04 nos of jig for retrieving data from memory of meter. Jig should be such that NVM can be push fit on this jig and data can be retrieve from this NVM).

2.4.26. Terminal Specs

(a) Minimum Internal Diameter of the terminal holes 9.5mm (minimum)  
(b) Clearance between adjacent terminals 10 mm (minimum)

2.4.27. Display

Meters are provided with 7 main digit LCD display. These are sufficient for WC current range and energy consumption.

2.4.28. Security feature

Programmable facility to restrict the access to the information recorded at different security level such as read communication, write communication, firmware selection from remote etc.

2.4.29. Software and communication compatibility

The bidder shall supply software required for local (CMRI-conventional/RF) & remote (AMI) connectivity including required training to use the software free of cost.

2.4.30. Calibration

Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However, parameters like RTC, TOD tariff, DIP (billing & load survey), billing date, display parameters etc. shall be reconfigure through CMRI and remotely over the air (OTA).
2.4.31. Communication module of meter for AMI

Meter shall have suitable arrangement for RF/ GPRS based NIC cards for remote communication as per the requirements of AMI as mentioned in CEA guideline and IS 16444. NIC card shall be replaceable type with proper sealing arrangement with meter. Meter shall have functionality to record the event along with date & time of module replacement/ removal from the meter.

2.4.32. Communication Layer Protocol

Should be as per clause 9.3 of IS 16444

2.4.33. Key Management and Security Feature

Should be as per IS 15959 Part-1 & Part-2

2.4.34. Usage Application

Indoor and Outdoor usage

2.4.35. Disconnector

The meter shall have the facility of disconnecting and re-connecting the load of the meter from the remote and by authenticated command through Laptop/HHU at site by means of a built-in contactor. This operation shall be conducted with the help of a third party software which is owned by JKPDD and in addition to the manufacturer's own software, both in RF / RF Mesh with fall back provision on Cellular (GPRS/ 3G / 4G / LTE) which can be given through optical port using external modem by utility.

Each operation of the switches shall be logged by the meter as an event with date and time stamp and reading parameters. This operation should be in line with clause 11 of IS 16444 (with latest amendment), however over current tripping should be disabled by default. The cumulative no. of such operations shall also be made available.

The make of the load switch should be of reputed make like Gruner (German), KG Technologies or equivalent and same shall be confirmed by the bidder during tendering. Switch shall be in compliance to IS 15884.

The brief technical particulars of this Disconnector / load switch are furnished below:

Table 12 - Disconnector Specifications

<table>
<thead>
<tr>
<th>S.No.</th>
<th>DESCRIPTION</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operating Voltage range</td>
<td>130 V to 470 V</td>
</tr>
<tr>
<td>2</td>
<td>Operating Current range</td>
<td>20 mA to 120 A</td>
</tr>
<tr>
<td>3</td>
<td>Maximum switching power</td>
<td>25 kVA per phase/ per IS 15884 Annex G</td>
</tr>
<tr>
<td>4</td>
<td>No. of poles</td>
<td>Min. 3 nos ( one in each phase R Y B )</td>
</tr>
</tbody>
</table>
5 | Operation of switches | Simultaneous |
---|-------------------|-------------|
6 | Utilization Categories | As per IS16444 |
7 | Min. number of operation | 3000 (close, open each) |

2.5. Communication capabilities and software feasibilities

a) The meter shall have facilities for data transfer locally through CMRI (Using optical port/NIC card) and remotely by GPRS/3G/4G/RF Mesh with proper security via Plug in type NIC.

b) It should be the responsibility of the bidder to ensure integration of meter into HES (Supplied by communication provider) of existing communication network system of JKPDD, (if Exists).

c) It shall be possible to reconfigure the meters for RTC, TOD Tariff, DIP (Demand Integration period), billing date, display parameters etc. through proper authentication process locally through CMRI and remotely Over the Air (OTA). Necessary keys if required for performing this reconfiguration operation should also be provided along with supply of meter lot & training to RECPDCL/JKPDD staff on how to use it free of cost. Bidder to provide this support on a later stage also on the request of RECPDCL/JKPDD without any cost implication.

d) Optical Communication port shall be available for communication. Communication ports shall not be affected by any type of injection /unauthenticated signals and having proper sealing arrangement. The complete data shall be downloaded within 5 minutes.

e) The bidder shall supply software required for local (CMRI) & remote (AMI) connectivity including required training to use the software free of cost. Bidder shall provide the communication protocol / APIs for communication with meter through local (CMRI) / remote (AMI) as and when required by RECPDCL/JKPDD free of cost during life time of meter. The bidder should provide DLMS compliance for Communication with the meter at Optical port and at HES.

f) Bidder should also provide software for changing firmware of meters in mass and should support integration of this software with HES. Bidder should also provide base computer software (BCS) for viewing the data downloaded through HES/CMRI/laptop/HHU in separate PC/laptop. Android based/windows/linux based HHU shall be preferred. API required for converting raw file to XML. (DLMS/OBIS) should also be provided if applicable.

g) For purpose of exercising control, like outage management, the meter should send abnormalities at the consumers' end like Power failure (Last Gasp), Power Restoration (First Breath). Additional exceptional events should also be communicated to HES by meter immediately after the occurrence through RF / RF Mesh. It should also indicate the restoration of the same event. List of events to be reported should be configurable Over the Air(OTA). List will be decided during blue Printing stage. The meter should have "Last Gasp" and "First Breath" feature to facilitate sending alerts to the HES during fully powered off / On condition.

h) Two way communications between:
   I. Base Station (HES) and Data Concentrator Unit (DCU) shall be through GPRS/3G/4G/RF/Fiber/Ethernet or any other suitable media, depending upon suitability and choice of RECPDCL/JKPDD.
   II. Meter and Intermediated Communication Network Elements (if Exists) and/or Data Concentrator Unit through RF/Hybrid (GPRS/3G/4G/RF/Fiber).
   III. Intermediated Communication Network Elements (if Exists) and Data Concentrator Unit (if different & if applicable) through RF/Hybrid (GPRS/3G/4G/RF/Fiber).
i) Last mile mesh network must support auto-registration and self-healing feature to continue operation using easiest possible available route in case of failure of any communication device in the mesh.

j) Meter Serial no will be used for tagging of all data of the meters in all database (at HES / MDM/ DCU level etc.). However, it will be the responsibility of the Bidder to establish the complete communication solution involving all the meters in the system. Also, the Bidder must ensure that, the mode of communication used for RF shall be consistent with the Government of India stipulations.

k) Integration of meter software’s with HES / MDMS for seamless transfer of data will be in scope of bidder till the expiry of warranty of the meters. It is desired firmware up gradation/selection should be available over the air.

l) Bidder has to ensure that meter supplied by him will be compatible with RF/GPRS solution and HES/MDMS supplied by him.

m) Communication of the meter at optical port /OTA (NAN/WAN) should be as per IS 15959 (Part-2):2016.

n) Communication network should be immune with any external Magnetic field/ESD/Jammer/HV voltage influence such that it shall not affect the normal overall functionality.

o) Meter once powered up with NIC card should be self-detected (First Breath) by communication network and its basic name plate details & current readings should be transferred to HES.

p) RTC of all the meters and network elements installed shall be synchronized with server. The maximum drift of one (1) minute shall be permitted. All components shall support standard RTC synchronization methods. Bidder need to provide detailed architecture and process used for same after award of contract. RTC synchronization process shall not affect the general functionality and SLA requirements. Meters shall have log in memory as an event of RTC synchronization along with date & time and drift. Although meter RTC shall not get drifted by more than 3 minutes in a year, if no synchronization process performed.

2.6. Immunity against external influencing signals

Magnetic Field:
Meter shall comply magnetic immunity as per CBIP report 325 or latest amendment. Meter shall log magnet event in memory and shall record at Imax during magnetic influence.

Electrostatic Discharge (ESD)
Meter shall comply ESD immunity as per CBIP report 325 or latest amendment. Meter shall immune or log ESD event in memory. In any case meter recording shall not be affected due to influence of ESD signal. Meter shall withstand and record accurately upto 35kV ESD signals.

2.7. Neutral Disturbance & other tampers

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of Chopped signal/ DC signal/ DC pulse up to 330V and for any value beyond this. Meter shall log the event into memory as ‘Neutral Disturbance’ with date & time stamp the thresholds are as per Table 13 - Tamper event details for 3 phase meters.

2.8. Abnormal and Tamper conditions

The meter shall record forward energy under all abnormal tampering conditions and shall be capable of recording occurrence and restoration of abnormal events listed below along with date & time and snap shots of individual voltages, currents, power factors, active energy and apparent energy at the time of occurrence of abnormal event and restoration of normal supply. All tamper logging thresholds values shall be configurable from remotes.

Note: “Meter shall have neutral CT for tamper identification and analysis.”
The meter shall register correctly if supply neutral is not available at the meter neutral terminal. The meter shall work in absence of any phase. It shall keep recording correctly in case of unbalance system voltage also as defined above.

The meter shall keep working accurately irrespective of the phase sequence of the supply. The meter shall be functional even if somehow change in the phase sequence takes place. Meter shall sufficiently record this feature as reverse sequence.

Table 13 - Tamper event details for 3 phase meters

<table>
<thead>
<tr>
<th></th>
<th>Current Related</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a. Occurrence and restoration of following current related events shall be logged in meter memory as per table A5 of IS 15959 (Part 2).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. For each occurrence event captured, the cumulative tamper count shall be incremented.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Power related</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>a. Occurrence and restoration of following Power related events should be logged in meter memory as per table A6 of IS 15959 (Part 2).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Only Real clock (date and time) and event code shall be captured.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Power On/ Off</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Meter shall detect occurrence and restoration of power off if the phase voltage is absent more than a threshold period.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Voltage related</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>a. Occurrence and restoration of following Voltage related events shall be logged in meter memory.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. For each occurrence event captured, the cumulative tamper count shall be incremented</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Low Voltage Logging</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Event shall be logged in memory along with Occurrence and restoration event data. Threshold should be below 180 Volts. Manufacturer should explain behaviour of meter below 120V.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Protection against HV spark</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Meter shall continue to record energy or log the event, in case it is disturbed externally using a spark gun/ ignition coil. Upto 35 KV meter should remain immune. Communication port shall also be immune upto 35KV with cover in place. The Meter shall comply to HV spark when Meter installed in field conditions.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Others</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>a. Occurrence and restoration of following events shall be logged in meter memory as per table A8 of IS 15959 (Part 2).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. For each occurrence event captured, the cumulative tamper count shall be</td>
<td></td>
</tr>
</tbody>
</table>
c. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).

<table>
<thead>
<tr>
<th>8. Neutral disturbance</th>
<th>Meter shall log all events when AC/DC/ Pulsating voltage is injected in neutral circuit especially when it can disturb the recording of energy. Manufacturer should specify the method of testing of Neutral disturbance.</th>
</tr>
</thead>
</table>
| 9. External Magnetic Interference | a. The meter shall either remain immune to tamper through application of external magnetic field (AC electro magnet or DC magnet) as per value specified in CBIP 325 or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F. as per CBIP 325 and same should also be logged as event with date & time.  
  
  b. In case of abnormal permanent magnetic field, either meter shall remain immune or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F and it should also be logged as event with date & time.  
  
  c. The meter shall be provided with built in logic/ indication and sensor to detect tamper beyond meter’s magnetic immunity level and display of such occurrences. The meter accuracy or accuracy display shall not be affected by permanent magnetic field up to meter’s magnetic immunity level.  
  
  d. At the time of occurrence of magnetic tamper, meter should record tamper event with Imax, rated voltage and unity P.F and at the time of restoration it should logged with actual parameters  
  
  e. Manufacturer should explain method of MD computation during magnetic interference. |
| 10. Non rollover events | a. Occurrence of following non-rollover events shall be logged in meter memory as per table A9 of IS 15959 (Part 2).  
  
  b. For each occurrence event captured, the cumulative tamper count shall be incremented.  
  
  c. For these events, only date and time shall be captured.  
  
  d. Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1). |
<p>| 11. Top cover open | Meter shall detect opening of top cover and this event shall be logged. Detection and logging mechanism shall work even when the meter is de-energized. Logic shall be defined. |
| 12. Connection Related Tamper Conditions | The meter shall not get affected by any remote control device &amp; shall continue recording energy under any one or combinations of the following conditions: |</p>
<table>
<thead>
<tr>
<th></th>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td><strong>I/C &amp; O/G Interchanged</strong></td>
<td>Meter should record forward energy within limits of accuracy class 1.0.</td>
</tr>
<tr>
<td>14</td>
<td><strong>Event Logging</strong></td>
<td>Total number of events to be stored shall be minimum 20 for power On/Off event and not more than 50 for all other events in FIFO basis.</td>
</tr>
<tr>
<td>15</td>
<td><strong>Parameter Snapshot</strong></td>
<td>Captured parameters mentioned above are to be captured when event occurrence and restoration is logged as per table A11 of IS 15959 (Part 2).</td>
</tr>
<tr>
<td></td>
<td>i. Date and time of event</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii. Event code</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Current R Phase - instantaneous current.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>v. Current B Phase - instantaneous current.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vi. Voltage R Phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vii. Voltage Y Phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>viii. Voltage B Phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ix. Power factor R Phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>x. Power factor Y Phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>xi. Power factor B Phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>xii. Cumulative energy- kWh</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td><strong>Tamper Indication</strong></td>
<td>Appropriate Indications/Icons for all tampers should appear on the meter display either continuously or in auto display mode.</td>
</tr>
<tr>
<td>17</td>
<td><strong>Tamper Logics</strong></td>
<td>A logic sheet for tamper/ event detection and logging shall be submitted for purchaser’s approval. Following details should be provided for each tamper in tabular form</td>
</tr>
<tr>
<td></td>
<td>a. Detailed Tamper logic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Threshold values</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Persistence times</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Restoration time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Event count</td>
<td></td>
</tr>
</tbody>
</table>
2.9. GENERAL CONSTRUCTION REQUIREMENT

The Meter shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal conditions, so as to ensure especially personal safety against electric shock, safety against effect of excessive temperature, protection against spread of fire, protection against penetration of solid objects, dust and water.

All parts, which are subject to corrosion under normal working conditions, shall be protected effectively. Any protective coating shall not be liable to damage by ordinary handling or damage due to exposure to air, under normal working conditions.

The meters shall be designed and manufactured using SMT (Surface Mount Technology) components.

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 as given below or any other equivalent make with the strict approval of Purchaser:

The bidder is also required to furnish details as per the table mentioned below.

Table 14

<table>
<thead>
<tr>
<th>S No</th>
<th>Component Function</th>
<th>Requirement</th>
<th>Makes and Origin (to Be provided by bidder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Measurement/computing chips</td>
<td>The Measurement/ computing chips used in the meter should be with the Surface mount type along with the ASICs</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Memory chips</td>
<td>The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Display modules</td>
<td>The display modules should be well protected from the external UV radiations. The display visibility should be sufficient to read the meter mounted between height of 0.5m and 2m. The construction of the modules should be such that the displayed quantity should not disturbed with the life of display. (Pin Type) It should be trans-reflective STN type industrial grade with extended temperature range.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Optical port</td>
<td>Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>P.C.B.</td>
<td>Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Electronic components</td>
<td>The active &amp; passive components should be of the surface mount type &amp; are to be handled &amp; soldered by the state of art assembly processes.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Battery</td>
<td>Lithium with guaranteed life of 15 years</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>RTC / Micro controller</td>
<td>The accuracy of RTC shall be as per relevant IEC / IS standards</td>
<td></td>
</tr>
</tbody>
</table>

**2.9.1. Meter Body**

a) Base body and top cover shall be made of UV stabilized, unbreakable high grade flame retardant insulating material of good dielectric and mechanical strength with FV2/V2 inflammability level.
b) Base body shall be opaque.
c) Top cover shall be transparent or opaque/translucent with viewing window.
d) Usage of equivalent material shall be with prior approval of JKPDD.
e) Top cover and base should be fixed in such a manner that it shall be break to open/ultrasonically welded/Chemically Welded.
f) Meter body shall be sealed in such a way that opening of meter base and cover is not possible without breaking the seals.
g) Thickness of meter body (Base and Terminal cover) shall be 2mm minimum.

**2.9.2. Terminals, Terminal Block**

a) Terminals shall be suitable for 25 Sq. mm aluminium cable.
b) Two no’s flat head screws and washers per terminal shall be provided
c) Material of terminals, screws and washers should be brass or tinned copper. Terminals shall be tested for continuous current of 120 % Imax.
d) Terminals shall be clearly marked for phase / neutral / outgoing etc. this marking shall appear in the connection diagram
e) Clearances and creep age shall be as per IS 13779.
f) The terminals and connections shall be suitable to carry up to 120 % of Imax continuously
g) The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating.
h) The terminal block shall be moulded type made of non-hygroscopic, flame-retardant material having good dielectric and mechanical strength.
i) The moulded terminal block shall be made from best quality phenol formaldehyde/Poly carbonate conforming to IS:13779-1999 (latest amended) having adequate insulating properties and mechanical strength with brass inserts for connecting terminals.
j) The terminal block should satisfy all the conditions specified in IS:13779 and IEC 62052 - 11. The material of the terminal block should fulfill the requirement of following tests:
  k) The flame retardant rating of V0 as per UL 94 testing.
  l) The glow wire test for temperature of 960OC. as per IS:11000 (Part 2/Sec.1) or IEC 60695-2-1.
  m) Heat deflection temperature (HDT) test of 135OC. as per ISO 75 or ASTM D-648
  n) Ball pressure test at 125OC. as per IEC 60335-1.
  o) Terminal block shall be opaque.
  p) Usage of equivalent material shall be with prior approval of JKPDD.
  q) Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135OC and pressure of 1.8MPa.
  r) The terminals shall be designed so as to ensure adequate and durable contact such that there is no risk of loosening or undue heating.
  s) Terminal block shall be such that the risk of corrosion due to contact with other metal part is minimized.
  t) Electrical connections shall be designed such that contact pressure is not transmitted through insulating material.

2.9.3. Terminal Cover

a) Material - UV stabilized transparent polycarbonate cover
b) Provision of sealing at one point through sealing screw.
  c) The sealing screws shall be held captive in the terminal cover.
  d) The meter shall be supplied with extended terminal block cover (ETBC). The ETBC shall be extended by minimum 50mm below plane surface of the terminal block with suitable sealing arrangement of terminal cover for providing numbered double anchor polycarbonate lash wire seal, which shall be supplied loose by the bidder as per technical specification of Polycarbonate Seals.
  e) The terminal cover of the meter should be hinged either at the top or left side so that it opens from bottom to top or hinged at the left side so that it opens from right to left of the meter.
  f) Terminal cover should have provision for cable entry from bottom.
  g) Terminal cover shall have sufficient space for incoming and outgoing cable such that these can pass without stressing and damaging the terminal cover.
  h) Diagram of external connections should be embossed on clearly on inside portion of terminal cover. Meter terminals shall also be marked and this marking shall appear in the above diagram. Stickers of any kind will not be accepted.

2.9.4. Sealing of meter

Reliable sealing arrangement shall be provided to make the meter tamper evident and to avoid fiddling or tampering by unauthorized persons. For this, one no. Polycarbonate seal and one no. Hologram seal shall be provided by the Purchaser. One no polycarbonate seal and one no. hologram seal shall be provided by the bidder. All the seals shall be fixed on meter body by the bidder at his works before dispatch.

One sealing provision shall be provided at meter terminal cover; such that terminal shall not be accessible without breaking the seals. All the seals shall be provided on front side only and as per the Purchaser specification. Rear side sealing arrangement shall not be accepted. Bidder shall provide seals be as per CEA regulation (2006). Only patented seals to be used as per CEA requirements.

Plug in type NIC card should have proper sealing arrangement.

2.10. TOD FEATURE

The meter shall have ToD features as mentioned in IS16444 and IS15959 Part 2. Meter shall have provision of storing energy and demand parameters in separate tariff registers as well as cumulative registers.

2.11. MD INTEGRATION
The MD integration period shall be 30 minutes (integration period-programmable by CMRI at site and also through AMR with adequate security level). The MD resetting shall be automatic at the 1st of the month i.e. 0000 hours of 1st day of the month. Manual MD reset button shall not be available. Last six MD values shall be stored in the memory and one to be displayed in the Auto scroll mode. MD shall be recorded and displayed with minimum three digits before decimal and minimum two digits after decimal points.

2.12. **DOWNLOADABLE PARAMETER for HES/BCS/MDM:**

The parameters shall be as under

**2.12.1. Load Survey**

The meter shall be capable of recording load profile of 45 days 30 min IP. Meter shall be capable of recording daily Energy and Demand 00:00 to 24:00 Hrs. Parameter to capture for load survey and daily profile shall be in line with IS 15959 part 2

**2.12.2. Instantaneous Parameters**

Meter shall be capable for following Instantaneous Parameters in Memory and should be available in BCS. Parameter to capture for instantaneous profile shall be in line with IS 15959 part 2

**2.12.3. General Information**

Meter shall be capable for providing below mentioned general parameters in memory

- Meter Serial number
- Software Name
- Version
- Manufacture Name
- Manufacture Year
- Meter Type
- Meter Class
- Meter Constant
- Meter Voltage Rating
- Meter Current Rating
- TOD profile

**2.12.4. Billing Parameters**

Billing profile shall be in accordance to IS 15959 Part 2

**2.12.5. Transactions**

All the changes in software of meter to be logged along with date & time stamp and readings. Meter should do billing if any transaction is done.
2.12.6. Tamper Events

All the events should be logged as per Table 13 - Tamper event details for 3 phase meters. Parameters in tamper Snap shots shall be as per IS 15959 Part 2

2.12.7. Display Units

The display unit shall be Pin type built-in liquid crystal display (Permanently backlit type LCD). The LCD shall be of STN (Super Twisted Nematic) construction suitable for maximum temperature withstands 65 C degree and minimum temperature withstands 0degree C during normal operating condition. The LCD display shall have a wide viewing angle of 120 degrees. When the meter is not energized the electronic display need not be visible. The display shall not be affected by electrical, magnetic disturbances and ESD. The display should be readable in direct sunlight.

The KWh & KVAh register shall have minimum 7 digits LCD display and size of the digits shall be minimum 10mmx5mm. Cumulative energy (KWh & KVAh) shall be displayed without decimal in auto scroll mode. (However decimal shall be available in push button mode for high resolution display for testing).

2.12.8. Auto Scroll mode (For Import Configuration)

Persistence time for each parameter shall be 10 second. Values followed by header shall be avoided. (i.e. if MD1 is displayed in Auto scroll mode, Header (MD1) and value (say 5.23 KW) shall be shown simultaneously; it shall not be shown in successive displays. Off time shall not be available in auto scroll mode between each cycle. Auto scroll mode is restored after 10 secs, if push button is not operated.

Display should not be stuck for any tamper events. Meter shall have proper indication for communication and network status i.e. NIC has joined NW or out of Network or signal strength and other diagnosis parameters.

Following shall be continuously displayed in auto scroll and push button mode in the given order.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Auto Scroll Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCD CHECK</td>
</tr>
<tr>
<td>2</td>
<td>Meter Sr. No.* &gt; Complete Meter Serial no. should be there in single shot.</td>
</tr>
<tr>
<td>3</td>
<td>d- dd:mm:yy</td>
</tr>
<tr>
<td>4</td>
<td>t- hh:mm:ss</td>
</tr>
<tr>
<td>5</td>
<td>b 1 KWh</td>
</tr>
<tr>
<td>6</td>
<td>b 1 KVAh</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7</td>
<td>b 1 MD KW  MD in KW on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>8</td>
<td>b 1 MD KVA MD in KVA on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>9</td>
<td>b 1 PF  Average power factor of entire month on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>10</td>
<td>C KWh  Current Cumulative KWh</td>
</tr>
<tr>
<td>11</td>
<td>C KVah  Current Cumulative KVah</td>
</tr>
<tr>
<td>12</td>
<td>C KVARh lag  Current Cumulative KVARh(lag).</td>
</tr>
<tr>
<td>13</td>
<td>C KVARh lead  Current Cumulative KVARh(lead).</td>
</tr>
<tr>
<td>14</td>
<td>Pr 1 MD KW  Current MD – KW</td>
</tr>
<tr>
<td>15</td>
<td>Pr 1 MD KVA  Current MD - KVA</td>
</tr>
<tr>
<td>16</td>
<td>U1 V  R Phase Voltage (Instantaneous value).</td>
</tr>
<tr>
<td>17</td>
<td>U2 V  Y Phase Voltage (Instantaneous value).</td>
</tr>
<tr>
<td>18</td>
<td>U3 V  B Phase Voltage (Instantaneous value).</td>
</tr>
<tr>
<td>19</td>
<td>A1 A  R Phase Current (Instantaneous value).</td>
</tr>
<tr>
<td>20</td>
<td>A2 A  Y Phase Current (Instantaneous value).</td>
</tr>
<tr>
<td>21</td>
<td>A3 A  B Phase Current (Instantaneous value).</td>
</tr>
<tr>
<td>22</td>
<td>Pr PF  Instantaneous power factor</td>
</tr>
<tr>
<td>23</td>
<td>Pr KW  Instantaneous load in KW</td>
</tr>
</tbody>
</table>
Pr KVA        Instantaneous load in KVA

Status of load switch(Connect or disconnect)

Fail to be log in memory in the following conditions only in BCS not in display

a. RTC fail
b. NVM memory fail
c. Battery fail
d. NIC card fail

2.12.9. Push Button Scroll mode (For Import Configuration)

Following parameters shall be displayed in Push button mode in the given order after display of all the tamper events.

Table 16

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Push Button Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCD CHECK</td>
</tr>
<tr>
<td>2</td>
<td>Meter Sr. No.* &gt; Complete Meter Serial no. should be there in single shot.</td>
</tr>
<tr>
<td>3</td>
<td>d- dd:mm:yy</td>
</tr>
<tr>
<td>4</td>
<td>t- hh:mm:ss</td>
</tr>
<tr>
<td>5</td>
<td>b 1 KWh        KWh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>6</td>
<td>b 1 KVAh       KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>7</td>
<td>b 1 1MD KW     MD in KW on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>8</td>
<td>b 1 2MD KVA MD in KVA on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>9</td>
<td>b 1 PF        Average power factor of entire month on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>10</td>
<td>C KWh</td>
</tr>
<tr>
<td>11</td>
<td>C KVArh</td>
</tr>
<tr>
<td>12</td>
<td>C KVArh lag</td>
</tr>
<tr>
<td>13</td>
<td>C KVArh lead</td>
</tr>
<tr>
<td>14</td>
<td>Pr 1 MD KW</td>
</tr>
<tr>
<td>15</td>
<td>Pr 1 MD KVA</td>
</tr>
<tr>
<td>16</td>
<td>rc MD</td>
</tr>
<tr>
<td>17</td>
<td>U1 V</td>
</tr>
<tr>
<td>18</td>
<td>U2 V</td>
</tr>
<tr>
<td>19</td>
<td>U3 V</td>
</tr>
<tr>
<td>20</td>
<td>A1 A</td>
</tr>
<tr>
<td>21</td>
<td>A2 A</td>
</tr>
<tr>
<td>22</td>
<td>A3 A</td>
</tr>
<tr>
<td>23</td>
<td>Pr PF</td>
</tr>
<tr>
<td>24</td>
<td>Pr KW</td>
</tr>
<tr>
<td>25</td>
<td>Pr KVA</td>
</tr>
<tr>
<td>26</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Auto Scroll Display (Net Meter Configuration)</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>LCD CHECK</td>
</tr>
<tr>
<td>2</td>
<td>Meter Sr. No.* &gt; Complete Meter Serial no. should be there in single shot.</td>
</tr>
<tr>
<td>3</td>
<td>d- dd:mm:yy</td>
</tr>
<tr>
<td>4</td>
<td>t- hh:mm:ss</td>
</tr>
<tr>
<td>5</td>
<td>b 1 kWh Import  KWh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>6</td>
<td>b 1 KVAh Import  KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>7</td>
<td>b 1 KVArh Lag Import KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>8</td>
<td>b 1 KVArh Lead Import KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>9</td>
<td>b 1 MD KW import MD in KW on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>10</td>
<td>b 1 MD KVA import MD in KVA on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>11</td>
<td>b 1 KVArh Lag Import KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>12</td>
<td>b 1 KVArh Lead Import KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>13</td>
<td>b 1 kWh Export  KWh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>14</td>
<td>1 KVAh Export                   KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>15</td>
<td>1 KVARh Lag Export               KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>16</td>
<td>1 KVARh Lead Export              KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>17</td>
<td>1 MD KW Export                   MD in KW on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>18</td>
<td>1 MD KVA Export                  MD in KVA on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>19</td>
<td>1 KVARh Lag Export               KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>20</td>
<td>1 KVARh Lead Export              KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>21</td>
<td>1 PF                            Average power factor of entire month on 1st of last</td>
</tr>
<tr>
<td></td>
<td>month at 00.00 hrs.</td>
</tr>
<tr>
<td>22</td>
<td>C KWh import                     Current Cumulative KWh</td>
</tr>
<tr>
<td>23</td>
<td>C KVAh Import                    Current Cumulative KVAh</td>
</tr>
<tr>
<td>24</td>
<td>C KVARh lag Import               Current Cumulative KVARh(lag).</td>
</tr>
<tr>
<td>25</td>
<td>C KVARh lead Import              Current Cumulative KVARh(lead).</td>
</tr>
<tr>
<td>26</td>
<td>C KWh Export                     Current Cumulative KWh</td>
</tr>
<tr>
<td>27</td>
<td>C KVAh Export                    Current Cumulative KVAh</td>
</tr>
<tr>
<td>28</td>
<td>C KVARh lag Export               Current Cumulative KVARh(lag).</td>
</tr>
<tr>
<td>29</td>
<td>C KVARh lead Export              Current Cumulative KVARh(lead).</td>
</tr>
<tr>
<td>30</td>
<td>Pr 1 MD KW                       Current MD – KW</td>
</tr>
</tbody>
</table>
### Push Button Scroll mode

Following parameters shall be displayed in Push button mode in the given order after display of all the tamper events.

Table 18

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Push Button Display (For Net Configuration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCD CHECK</td>
</tr>
<tr>
<td>2</td>
<td>Meter Sr. No.* &gt; Complete Meter Serial no. should be there in single shot.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td><strong>d-dd:mm:yy</strong></td>
</tr>
<tr>
<td>4</td>
<td><strong>t-hh:mm:ss</strong></td>
</tr>
<tr>
<td>5</td>
<td><strong>b 1 KWh Import</strong> kWh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>6</td>
<td><strong>b 1 KVAh Import</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>7</td>
<td><strong>b 1 KVARh Lag Import</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>8</td>
<td><strong>b 1 KVARh Lead Import</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>9</td>
<td><strong>b 1 MD KW import</strong> MD in KW on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>10</td>
<td><strong>b 1 MD KVA import</strong> MD in KVA on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>11</td>
<td><strong>b 1 KVARh Lag Import</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>12</td>
<td><strong>b 1 KVARh Lead Import</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>13</td>
<td><strong>b 1 KWh Export</strong> kWh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>14</td>
<td><strong>b 1 KVAh Export</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>15</td>
<td><strong>b 1 KVARh Lag Export</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>16</td>
<td><strong>b 1 KVARh Lead Export</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>17</td>
<td><strong>b 1 MD KW Export</strong> MD in KW on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>18</td>
<td><strong>b 1 MD KVA Export</strong> MD in KVA on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>19</td>
<td><strong>b 1 KVARh Lag Export</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td>20</td>
<td><strong>b 1 KVARh Lead Export</strong> KVAh reading on 1st of last month at 00.00 hrs.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>21</td>
<td>b 1 PF</td>
</tr>
<tr>
<td>22</td>
<td>C KWh import</td>
</tr>
<tr>
<td>23</td>
<td>C KVArh Import</td>
</tr>
<tr>
<td>24</td>
<td>C KVArh lag Import</td>
</tr>
<tr>
<td>25</td>
<td>C KVArh lead import</td>
</tr>
<tr>
<td>26</td>
<td>C KWh Export</td>
</tr>
<tr>
<td>27</td>
<td>C KVArh Export</td>
</tr>
<tr>
<td>28</td>
<td>C KVArh lag Export</td>
</tr>
<tr>
<td>29</td>
<td>C KVArh lead Export</td>
</tr>
<tr>
<td>30</td>
<td>Pr 1 MD KW</td>
</tr>
<tr>
<td>31</td>
<td>Pr 1 MD KVA</td>
</tr>
<tr>
<td>32</td>
<td>rc MD</td>
</tr>
<tr>
<td>33</td>
<td>U1 V</td>
</tr>
<tr>
<td>34</td>
<td>U2 V</td>
</tr>
<tr>
<td>35</td>
<td>U3 V</td>
</tr>
<tr>
<td>36</td>
<td>A1 A</td>
</tr>
<tr>
<td>37</td>
<td>A2 A</td>
</tr>
</tbody>
</table>
### 2.12.10. Output Device

(a) **Pulse Rate**: The meters shall have a suitable test output device. Red color blinking LED (marked as imp/kWh) shall be provided in the front. This device shall be suitable for using with sensing probe used with test benches or reference standard meters. The test output device shall have constant pulse rate of (preferred value- 3200) pulse / kWh. Meter constant shall be indelibly printed on the name plate as (preferred value- 3200) imp / KWh.

(b) **Communication LCD indicator**: The meter shall be provided with suitable LCD indication RxD and orange TxD communication in progress.

(c) **Load Switch LCD indicator**: The meter shall be provided with suitable LCD indication for condition of load switch (Close/open). LCD should show when load switch is open.

(d) **Phase Indicator**: The meter shall be provided with suitable LCD/ LED indication for phase availability.

### 2.12.11. Mid Night Values

Meter should have mid night log for KWh for last 45 days.

### 2.13. NAME PLATE AND MARKING

Meters shall have a name plate clearly visible and effectively secured against removal. The base color of Name plate shall be approved by JKPDD, indelibly and distinctly marked with all essential particulars as per relevant standards along with the following.

1. Manufacturer's name
2. Type designation
3. Number of phases and wires
4. Serial number (Meter serial number shall be laser printed on name plate instead on sticker).
5. Month and Year of manufacture
6. Unit of measurement
7. Reference voltage, frequency
8. Ref. temperature if different from 27 deg. C

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>A3</td>
<td>B Phase Current (Instantaneous value).</td>
</tr>
<tr>
<td>39</td>
<td>Pr</td>
<td>PF</td>
</tr>
<tr>
<td>40</td>
<td>Pr</td>
<td>KW</td>
</tr>
<tr>
<td>41</td>
<td>Pr</td>
<td>KVA</td>
</tr>
<tr>
<td>42</td>
<td>Status of load switch (Connect or disconnect)</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>High Resolution C KWh import</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Meter FW version</td>
<td></td>
</tr>
</tbody>
</table>

Note: These Display parameters should have provision for inserting 24 additional parameters in display for future requirement.
9. Rated basic and maximum Current
10. Meter constant (imp/kWh)
11. ‘BIS’ Mark
12. Class index of meter
13. “Smart Meter Implementation by REC Power Distribution Company Ltd.”
14. "Property of JKPDD
15. Purchase Order No. & date
16. Guarantee period
17. Rated frequency
18. Sign of double square
19. Country of manufacture
20. Symbol of load switch
21. Communication Tech for WAN and NAN (with carrier frequency)
22. Communication Technology is IHD supported (with carrier frequency)
23. Firmware version for meter (Optional)
24. Category

The above details shall be laser printed on meter top cover.

However, the following shall be printed in bar code on the meter nameplate. (Shall be printed on name plate instead on sticker).

1. Manufacturer’s code No. (given by JKPDD)
2. Meter Sr. No.
3. JKPDD Property
4. Month/Year of manufacture.

2.14. TESTS

All routine, acceptance & type tests shall be carried out on the meter and meter body separately in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted in addition to the tests specified in IS/IEC.

2.14.1. Type Test

(f) Test against abnormal magnetic influence as per CBIP TR 325.
(g) DC immunity test (injection both on phase and neutral terminal) Test for Material used for Terminal Block and meter body as per relevant standards.
(h) IP test

2.14.2. ROUTINE TEST

a) AC High Voltage test
b) Insulation test
c) Test on limits of error
d) Test of starting current
e) Test of no load condition

2.14.3. ACCEPTANCE TEST

a) AC High Voltage test
b) Insulation test
c) Test on limits of error
d) Test of meter constant
e) Test of starting current
f) Test of no load condition

g) Test of repeatability of error.

h) Test of power consumption.

i) Test for Immunity against external influencing signal as per the Purchaser specification

j) Test for Immunity against DC Immunity as per the Purchaser specification

k) Test for Immunity against Tamper conditions as per the Purchaser specification

l) Test to Influence of Harmonics

m) Supply voltage and frequency variation test

n) Testing of self-diagnostic features and tamper count increment and logging with date and time.

o) All tests as defined in IS15959(Part-2): 2016

2.14.4. SPECIAL TEST

a) The bidder shall demonstrate the communication capability of the meter through communication modes as defined in the specification before conducting acceptance tests. The bidder shall ensure that API (Application protocol interface) is compatible with JKPDD’S CFW.

b) Temperature rise of terminal block with 150% Imax for 6 hours.

2.15. TYPE TEST CERTIFICATE

The bidder shall furnish the type test certificates of the meter for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI as per the relevant standards. For communication testing any national approved laboratory or international acclaimed lab or equivalent will also suffice at the discretion of JKPDD. Type test should have been conducted in certified Test Laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to JKPDD.

2.16. PRE-DISPATCH INSPECTION

The successful bidder shall facilitate the pre-dispatch inspection at their works site. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection.

Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Bidder shall grant free access to the places of manufacture to JKPDD’s representatives at all times when the work is in progress. Inspection by the JKPDD or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by JKPDD.

Following documents shall be sent along with material.

a. Govt certified/accredited lab testing certificate

b. Meter Test reports

c. MDCC issued by JKPDD

d. Invoice in duplicate

e. Packing list

f. Drawings & catalogue

g. Guarantee / Warranty card
h. Delivery Challan
i. Other Documents (as applicable)
j. One no. leaflet with each meter

2.17. INSPECTION AFTER RECEIPT AT STORE

The material received at Purchaser’s store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to RECPDCL and JKPDD each.

2.18. GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a period of at least 60 months from the date of commissioning or 66 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Company, failing which the purchaser will be at liberty to get it replaced/rectified at bidder’s risks and costs and recover all such expenses plus the Company’s own charges (@ 20% of expenses incurred), from the bidder or from the “Security cum Performance Deposit” as the case may be.

Bidder shall further be responsible for ‘free replacement at site’ for another period of THREE years from the end of the guarantee period for any ‘Latent Defects’ if noticed and reported by the purchaser.

2.19. PACKING

(a) Bidder shall ensure that all material covered under this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The material used for packing shall be environmentally friendly. Packing and transportation shall be as per IS 15707:206 clauses 9.1 and 9.2.

(b) Individual meter should be packed in separate box. Routine test report of the individual meter shall be kept inside each carton of the meter.

(c) On back side of RTC the bidder shall print a picture of the meter with its small details like for consumer to know about meter.

2.20. QUALITY CONTROL

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished.

Quality should be ensured at the following stages:

(e) At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.

(f) At insertion stage, all components should undergo computerized testing for conforming to design parameter and orientation.

(g) Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipment (ATES).

(h) Prior to final testing and calibration, sample meters shall be subjected to aging test (i.e. meters will be kept in ovens for 24 hours at 55 Deg. C temperature and atmospheric humidity under real-life condition at its full load current. After 24 hours’ meter should work satisfactorily)
The JKPDD's engineer or its nominated representative shall have free access to the bidder's/manufacturer's works to carry out inspections.

2.21. MINIMUM TESTING FACILITIES

Bidder should ensure that supplier of meter should have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards/JKPDD specification. The bidder shall have duly calibrated Reference Standard meter of Class 0.1 or better accuracy or better.

2.22. MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

2.23. SPARES, ACCESSORIES AND TOOLS

Bidder to be provide free of cost 04 nos of jig for retrieving data from memory of meter with every new design of meter in which previous jig is supplied cannot be used. Jig should be such that NVM can be push fit on this jig and data can be retrieve from this NVM.

40 nos of optical cord for retrieving the data of meter through optical port should be provided, if design of optical port is changed from those of previously supplied meters.

2.24. DRAWINGS AND DOCUMENTS

Following drawings & Documents shall be prepared based on JKPDD specifications and statutory requirements and shall be submitted with the bid:

(a) Completely filled-in Technical Parameters.
(b) General arrangement drawing of the meter
(c) Terminal Block dimensional drawing
(d) Mounting arrangement drawings
(e) General description of the equipment and all components with makes and technical requirement.
(f) Type Test Certificates
(g) Experience List
(h) Manufacturing schedule and test schedule

After the award of the contract, four (4) copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>For Approval</th>
<th>For Review Information</th>
<th>Final Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Technical Parameters</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>General Arrangement drawings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>Terminal block Dimensional drawings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>Mounting arrangement drawing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>Manual/Catalogues</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Transport/ Shipping dimension drawing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>QA &amp;QC Plan</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Routine, Acceptance and Type</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Bidder shall subsequently provide Four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to JKPDD.

All the documents & drawings shall be in English language.

**Instruction Manuals:** Bidder shall furnish two softcopies (CD) and four (4) hard copies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

### 2.25. GUARANTEED TECHNICAL PARTICULARS

Bidder must ensure to furnish following GTP along with bid submission.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description</th>
<th>Units</th>
<th>As Furnished by Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type of meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Accuracy Class of the meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ib &amp; Imax</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>c. Operating Voltage for meter</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Operating Frequency</td>
<td>Hz</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Power Consumption and Burden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Starting Current</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Short time over current</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Influence of heating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Rated impulse withstand voltage</td>
<td>KV</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>AC withstand Voltage for 1 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Insulation resistance</td>
<td>M ohm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Between frame &amp;Current, voltage circuits connected together:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Between each current (or voltage circuit) &amp; each and every other circuit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Mechanical requirement as per IS 13779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Resistance to heat and fire (As per specification)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Degree of protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Resistance against climatic influence (as per IS 13779)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Electromagnetic Compatibility (EMC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Accuracy requirements (As per IS 13779)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Power factor range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Energy measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Connection Diagram for system on terminal cover</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Self-diagnostic feature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Initial startup of meter (meter shall be fully functional within 5 sec after reference voltage is applied to the meter terminals)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Terminal block</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Depth of the Terminal holes</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Internal diameter of terminal holes</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Clearance between adjacent terminals</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Communication capabilities as per</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Immunity against abnormal Magnetic influence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Immunity against ESD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>DC Immunity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Abnormal and tamper Conditions as per Table 13 - Tamper event details for 3 phase meters</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Grade of material for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Meter base</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) Meter cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>g) Terminal block</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>h) Terminal cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Tamper counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Recording forward energy in all conditions</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Makes of all components used in the meter to be provided</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Non Volatile memory (Retention period)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Measuring elements used in the meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Power supply to circuit in case of supply failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Display of measured values (As per specification)</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>LCD display (Type and viewing angle)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Pulse rate</td>
<td>Imp/kWh, Imp/KVARh</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Name plate marking</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Routine test certificates</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Acceptance test certificates</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Type test certificates</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Guarantee certificates</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Output Device (LEDs)</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Make of Disconnector switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Disconnector Technical particular as per Specification</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Terminal Screw dia.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
49. Allen Screw head size (Terminal Screw)

50. Fire retardant category of the material
   (b) Meter body
   (c) Terminal block

1.1.2. **SCHEDULE OF DEVIATIONS**

Bidders must submit any deviation as per the Form IV format.
2. **HEAD END SYSTEM (HES)**

The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters.

The AMI Implementing Agency (AIA) shall provide the HES suitable to support the collection and storage of data as per performance level for a defined no. of smart meters with facility of future expansion as per the requirement of the utility.

HES would perform all the requisite functions as per the defined functionalities of AMI and it is the responsibility of the AMI Implementing Agency (AIA)/ System Integrator to supply the requisite software and hardware to achieve the defined functionalities of AMI. HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data.

HES shall be developed on open platform based on distributed architecture for scalability without degradation of the performance using additional hardware. HES shall support storage of raw meter data, alarms and alerts for minimum 3 days. Adequate data base and security features for storage of data at HES need to be ensured.

The suggested functions of HES (not exhaustive) may be:

- Acquisition of meter data on demand & at user selectable periodicity
- Two way communication with meter/ DCU
- Signals for connect & disconnect of switches present in end points like meter
- Audit trail and Event & Alarm Logging
- Encryption of data for secure communication
- Maintain time sync with DCU / meter
- Store raw data for defined duration
- Handling of Control signals / event messages on priority
- Setting of Smart meter configurable parameters
- Communication device status and history
- Network information in case more than one technology is deployed in field between the two devices
- Critical and non-critical reporting functionality. The suggestive critical events may be alarms and event log for meter events like tamper/power failures etc., if data is not received from DCU/Meter, if relay does not operate for connect / disconnect or there is communication link failure with DCU/Meter or network failure while non critical events may be retry attempts on communication failure, periodic reading missing and failure to connect etc.

**Configuration**

HES shall facilitate programming of following meter parameters:

- Load profile capture period
- Demand integration period
- Setting of parameters for time of day (TOD/TOU) billing
- Prepaid function
- Net metering
- Billing date
- Clock setting/time synchronization
- Load curtailment limit
- Event setting for connect/disconnect
- Number of auto reconnection attempt
- Time interval between auto reconnection attempt
- Lock out period for relay
- Remote firmware upgrade
- Password setting
- Push schedule
- Setting threshold limits for monitored parameters
- Provision for adding more programming features in future
**Integration**

HES shall preferably interface with MDM on standard interfaces and the data exchange models and interfaces shall comply with CIM / XML / IEC 61968 or any other open standard. The solution shall be Service Oriented Architecture (SOA) enabled.
VOLUME-III : SECTION – II

TENDER DRAWINGS
4-IN-1 MMB FOR SINGLE PHASE METER WITH MOC (MULTIPLE OUTGOING CONNECTOR BOX)

All dimensions are in mm.

FOR TENDER PURPOSE ONLY

Rural Electrification Corporation Ltd.

4-IN-1 MMB FOR SINGLE PHASE METER WITH MOC (MULTIPLE OUTGOING CONNECTOR BOX)

All dimensions are in mm.
METAL METER BOX FOR SINGLE PHASE METER (DEEP DRAWN METHOD)

All dimensions are in mm.

FOR TENDER PURPOSE ONLY

Rural Electrification Corporation Ltd.

JKPDD- Smart Metering Project

METAL METER BOX FOR SINGLE PHASE METER (DEEP DRAWN METHOD)

Page 380 of 444
METAL METER BOX FOR THREE PHASE METER (DEEP DRAWN METHOD)

All dimensions are in MM.

FOR TENDER PURPOSE ONLY

Rural Electrification Corporation Ltd.

PROJECT: JKPDD- Smart Metering Project

METAL METER BOX FOR THREE PHASE METER (DEEP DRAWN METHOD)
FOR TENDER PURPOSE ONLY

Rural Electrification Corporation Ltd.

Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

REC/DDUGJY/LT-ACC-ABC/04

PROJECT: JKPDD- Smart Metering Project

SERVICE CLAMP

<table>
<thead>
<tr>
<th>Req Qty</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Wedge tie</td>
<td>T.P Elastomer</td>
</tr>
<tr>
<td>3</td>
<td>Bail</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>2</td>
<td>Wedge</td>
<td>Thermoplastic</td>
</tr>
<tr>
<td>1</td>
<td>Body</td>
<td>Thermoplastic</td>
</tr>
</tbody>
</table>

Note: Cable range: Suitable for Ø 3mm - Ø 9mm
INSULATION PIERCING CONNECTOR

CABLE RANGE:
SUITABLE FOR 10 TO 95 SQ.MM MAIN (Bare/Insulated)
& 1.5 TO 10 SQ.MM TAP (Bare/Insulated)
WEIGHT: "W" Grams (Approx)
RATED TIGHTENING TORQUE: "X" Nm

All dimensions are in mm.

For Tender Purpose Only

Rural Electrification Corporation Ltd.
JKPDD- Smart Metering Project

SHER HEAD
HEXAGONAL HEAD BOLT & NUT MB
FINISH: ELECTRO-GLAZED
RUBBER PADS

CONTACT TEETH
MATERIAL: COPPER ALLOY
CORROSION RESISTANT SURFACE TREATMENT

OUTER BODY
MATERIAL: UV STABILIZED THERMOPLASTICS

SUITSABLE FOR MAIN CONDUCTOR SIZES 16 TO 95 MM &
TAP CONDUCTOR SIZES 1.5 TO 50 MM²
TOLERANCE: ± 5% FOR ALL DIMENSIONS
CABLE RANGE:
SUITABLE FOR 10 TO 95 SQ.MM MAIN (Bare/Insulated) & 1.5 TO 10 SQ.MM TAP (Bare/Insulated)

WEIGHT: "W" Grams (Approx)

RATED TIGHTENING TORQUE: "X" Nm

<table>
<thead>
<tr>
<th>REP</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1</td>
<td>NUT M6</td>
<td>STEEL</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>WASHER</td>
<td>STEEL</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>SCREW</td>
<td>STEEL</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>BLADE</td>
<td>AL ALLOY</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>SEAL</td>
<td>T.P.ELASTOMER</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>LOWER BODY</td>
<td>THERMO PLASTIC - BLACK</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>UPPER BODY</td>
<td>THERMO PLASTIC - BLACK</td>
</tr>
</tbody>
</table>

FOR TENDER PURPOSE ONLY

Rural Electrification Corporation Ltd.

JKPDD- Smart Metering Project

EARTHING CONNECTOR

REC/ JKPDD /LT-ACC-ABC/06A
**Type & Size of Service Cable**

<table>
<thead>
<tr>
<th>Type</th>
<th>Connected Load</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twin Core Thermoplastic Insulated W.P. Cables As PER IS 3035 (Part-I)</td>
<td>Upto 2 KW</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>Above 2 KW</td>
<td>4.0 mm²</td>
</tr>
<tr>
<td></td>
<td>to 4 KW</td>
<td></td>
</tr>
</tbody>
</table>

**Minimum Ground Clearance**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Across the Road</th>
<th>Along the Road</th>
<th>Else Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5800</td>
<td>5500</td>
<td>4000</td>
</tr>
</tbody>
</table>

**Notes:**
1. The Maximum Span to be limited to 35 Meters.
2. Before wire 3.15mm size (10SWG) will be of Hard Quality as per IS: 280-1962
3(a). G.I. Pipe 20Ø will be of Medium Class as per IS: 1161-1968.
   (b) Alternatively L 35x35x5 with 25Ø PVC Pipe as per IS: 2509-1963 may be used.
4. Clamps to be made from 40x3 M.S. Flat

FOR TENDER PURPOSE ONLY

Rural Electrification Corporation Ltd.

**LT Service Connection Single Phase**
### SPIKE TYPE EARTHING FOR NORMAL SOIL

<table>
<thead>
<tr>
<th>ERE. CODE</th>
<th>DESCRIPTION</th>
<th>SECTION</th>
<th>LENGTH (in mm)</th>
<th>QTY. (in Nos.)</th>
<th>Wt./Mtr. Kg./Mtr.</th>
<th>Total Wt. (in Kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earth Spike Rod</td>
<td>Dia.20</td>
<td>2500</td>
<td>1</td>
<td>2.500</td>
<td>6.250</td>
</tr>
<tr>
<td>2</td>
<td>Clamp for Earth Spike</td>
<td>40x3</td>
<td>190</td>
<td>1</td>
<td>0.900</td>
<td>0.171</td>
</tr>
<tr>
<td>3</td>
<td>Bolt &amp; Nuts</td>
<td>M12</td>
<td>30</td>
<td>1</td>
<td>0.058</td>
<td>0.058</td>
</tr>
<tr>
<td>4</td>
<td>Spring Washers (3.5 THK.)</td>
<td>M12</td>
<td></td>
<td>1</td>
<td>0.004</td>
<td>0.004</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>6.483</strong></td>
</tr>
</tbody>
</table>

**NOTES:-**
1. ALL DIMENSIONS ARE IN MM.
2. EARTH TERMINAL SHOULD BE MADE OF GI STRIP 40x3 WITH INO. 120 STUD.
3. MANUFACTURING TOLERANCE:
   - UPTO 50mm ± 5%
   - 51 TO 100mm ± 4%
   - 101 TO 300mm ± 3%
   - ABOVE 300mm ± 2%
4. CLAMP IS TO BE WELDED TO SPIKE.
5. THE WHOLE ASSEMBLY IS TO BE HOT DIP GALVANISED (IS:2629&4759)
6. ALL MS PARTS SHALL CONFIRM TO IS:2062
7. WEIGHT MENTIONED IS FOR PACKING AND FORWARDING PURPOSE ONLY.

FOR TENDER PURPOSE ONLY

---

Rural Electrification Corporation Ltd.

**PROJECT**

JKPDD- Smart Metering Project

**SITE**

SPIKE TYPE EARTHING FOR NORMAL SOIL

---

**FOR TENDER PURPOSE ONLY**
TECHNICAL SPECIFICATION FOR COMMON METER READING INSTRUMENT (CMRI)

This specification of CMRI/HHU is indicative for bidder. Bidder shall supply required nos of CMRI/HHU for smart meters for two-way communication over RF in case communication network is down.

1. The supplied HHU/ CMRI shall have RF NIC card that can read data through the NIC card of Smart meter. It shall also possible to configure the programmable parameters in meter via HHU/CMRI through a secured RF network.
2. CMRI/HHU shall have USB or RS232 port to transfer the downloaded data of Smart meters at utility system i.e. HES/MDM for further processing.
3. HHU/CMRI shall base on UNIX operating system that can be interfaced with external peripherals i.e. PC/Laptop/Printer/Bar-code reader etc for spot billing application, Meter Data Analysis.
4. CMRI shall support various protocols like IEC, ANSI, PACT and compliance to CBIP technical Report-111. Portable Common Meter Reading Instrument (CMRI).
5. Bidder shall supply necessary SW along with CMRI to read and program the smart meters. It shall possible to read instant, bill, daily mid-night and load profile data as defined in IS15959 Part 2 through CMRI over RF network. It shall also possible to connect/disconnect the smart meter locally via CMRI in case remote communication network is not available.
6. CMRI shall also have standard communication port to read meter through optical port.
7. CMRI shall have sufficient memory (Flash) to store data of minimum 1000 smart meters.
8. Bidder shall supply suitable and handy bag for carrying the CMRI in field.
9. The CMRI shall support High Speed USB port for connecting external peripherals.
10. The CMRI shall complied IP67 or better, suitable for the project area weather conditions.
11. The CMRI shall have Rechargeable Li-Ion battery of not less than 3000mAh, for minimum 24Hrs operations,
12. The CMRI shall have wide graphical LCD for better user interface.
13. The CMRI shall have IED indications for:
   a. Data Transfer
   b. Data Receive
   c. Battery indication- LOW, Full etc
   d. Power Indication- On/Off
14. Climatic Conditions:

<table>
<thead>
<tr>
<th>The service conditions shall be as follows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum altitude above sea level</td>
</tr>
<tr>
<td>Maximum ambient air temperature</td>
</tr>
<tr>
<td>Maximum daily average ambient air temperature</td>
</tr>
<tr>
<td>Minimum ambient air temperature</td>
</tr>
</tbody>
</table>
maximum temperature attainable by an object exposed to the sun | 60 ° C
---|---
maximum yearly weighted average ambient temperature | 32° C
maximum relative humidity | 100%
average number of thunderstorm days per annum (isokeraunic level) | 70
average number of rainy days per annum | 120
average annual rainfall | 1500 mm
maximum wind pressure | 260Kg/m²

15. Keyboard: Alphanumeric with easy to operate key pad buttons.

16. Input/output Ports:
   a. Two RS232C ports with standard 9-Pin D-type female and RJ-11 interface
   b. USB Hi-speed port. Minimum USB2.0 supportable.

17. Basic design features:
   a. Designed on high speed ARM processor.
   b. Compact, lightweight, rugged.
   c. Auto power and back lit off for linger battery life
   d. Removable and extendable SD card slot.
   e. Large Viewing Area

18. CMRI shall support RF and GPRS both type of communication to read Smart meters and upload data to central server over GPRS network.
SPECIFICATION OF POLY CARBONATE SEALS REQUIRED FOR SEALING OF SINGLE / POLY PHASE METERS

CONTENTS

1.0 SCOPE
2.0 APPLICABLE STANDARDS
3.0 CLIMATIC CONDITIONS OF THE INSTALLATION
4.0 GENERAL TECHNICAL REQUIREMENTS
5.0 GENERAL CONSTRUCTIONS
6.0 NAME PLATE AND MARKING
7.0 TESTS
8.0 TYPE TEST CERTIFICATES
9.0 PRE-DESPATCH INSPECTION
10.0 INSPECTION AFTER RECEIPT AT STORE
11.0 GUARANTEE
12.0 PACKING
13.0 TENDER SAMPLE
14.0 QUALITY CONTROL
15.0 MINIMUM TESTING FACILITIES
16.0 MANUFACTURING ACTIVITIES
17.0 SPARES, ACCESSORIES AND TOOLS
18.0 DRAWING AND DOCUMENTS
19.0 GUARANTEED TECHNICAL PARTICULARS
20.0 SCHEDULE OF DEVIATIONS

1.0 SCOPE
The specification covers the design, manufacture, testing at manufacturers works, supply and delivery at destination stores of tamper evident poly-carbonate security seals (Anchor type) heat...
resistant for sealing of Meter body and terminal covers of energy meters, Meter Box, CT-PT Units etc. with non-corrosive, non-magnetic stainless steel sealing wire.

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

### 2 APPLICABLE STANDARDS

The equipment covered by this specification shall conform to the requirements stated in latest editions & amendments of relevant Indian/IEC Standards and shall conform to the regulations of local statutory authorities.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>IS 9000</td>
<td>Basic Environmental testing procedure for electrical and electronic items.</td>
</tr>
<tr>
<td>b</td>
<td>IS 15707 : 2006</td>
<td>Testing, evaluation, installation and Maintenance of ac electricity meters — Code of practice</td>
</tr>
<tr>
<td>c</td>
<td>ASTM F 997</td>
<td>Standard Specification for Polycarbonate Resin</td>
</tr>
<tr>
<td>d</td>
<td>ASTM D792-08</td>
<td>Specific Gravity</td>
</tr>
<tr>
<td>e</td>
<td>ASTM G154</td>
<td>Exposure to UV radiations</td>
</tr>
<tr>
<td>f</td>
<td>ASTM B 117 -09</td>
<td>Salt Spray Test</td>
</tr>
<tr>
<td>g</td>
<td>IS 15707 : 2006</td>
<td>Testing Evaluation installation and maintenance of AC Electricity Meters- Code of practice.</td>
</tr>
<tr>
<td>h</td>
<td>IEC 60068</td>
<td>Environmental testing.</td>
</tr>
<tr>
<td>i</td>
<td>CBIP–TR No.325</td>
<td>Specification for A.C. Static Electrical Energy Meters (latest amendment)</td>
</tr>
<tr>
<td>j</td>
<td>CEA Regulation : 2006</td>
<td>Installation and operation of meters Dtd: 17/03/2006 or latest amendment</td>
</tr>
<tr>
<td>k</td>
<td>Supply code</td>
<td>Delhi Supply Code 2006</td>
</tr>
</tbody>
</table>
### CLIMATE CONDITIONS OF THE INSTALLATION

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameters</th>
<th>Specified Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maximum Ambient temperature</td>
<td>50°C</td>
</tr>
<tr>
<td>2</td>
<td>Yearly average temperature</td>
<td>32°C</td>
</tr>
<tr>
<td>3</td>
<td>Daily average temperature</td>
<td>42°C</td>
</tr>
<tr>
<td>4</td>
<td>Minimum temperature</td>
<td>-30°C</td>
</tr>
<tr>
<td>5</td>
<td>Height above sea level</td>
<td>1500-2200 Mtrs.</td>
</tr>
<tr>
<td>6</td>
<td>Max. relative humidity</td>
<td>100%</td>
</tr>
<tr>
<td>7</td>
<td>Min. relative humidity</td>
<td>10%</td>
</tr>
<tr>
<td>8</td>
<td>Average No. of thunder storm days per year</td>
<td>54 days</td>
</tr>
<tr>
<td>9</td>
<td>Average rainfall</td>
<td>118 cm</td>
</tr>
<tr>
<td>10</td>
<td>Max. wind pressure</td>
<td>130 kgs/m²</td>
</tr>
<tr>
<td>11</td>
<td>Average number of rainy days per year</td>
<td>106 days</td>
</tr>
</tbody>
</table>

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3 g.

### GENERAL TECHNICAL REQUIREMENTS

<table>
<thead>
<tr>
<th>S. No.</th>
<th>DESCRIPTION</th>
<th>REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Material of seal</td>
<td>Polycarbonate grade 143R or equivalent</td>
</tr>
<tr>
<td>4.2</td>
<td>UV resistance properties</td>
<td>Should not get affected by UV rays</td>
</tr>
<tr>
<td>4.3</td>
<td>Boiling water, acid or chemicals resistance</td>
<td>Seal shall not be affect by boiling water, acid or chemicals</td>
</tr>
<tr>
<td>4.4</td>
<td>Seal wire</td>
<td>Seal should have 6 inch long 26 gauges, twisted strand stainless steel wire non corrosive &amp; non magnetic</td>
</tr>
<tr>
<td>4.5</td>
<td>Temperature Withstand</td>
<td>147 deg. Cel.</td>
</tr>
<tr>
<td>4.6</td>
<td>THICKNESS OF SEAL</td>
<td>Minimum 1mm thick</td>
</tr>
<tr>
<td>4.7</td>
<td>Serial number printing &amp; visibility</td>
<td>Serial number should be laser printed on male &amp; female part &amp; should be separately visible after closing of seal</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>4.8</td>
<td>Company MONOGRAM</td>
<td>JKPDD Monogram to be embossed as specified.</td>
</tr>
<tr>
<td>4.9</td>
<td>Embossing quality</td>
<td>Embossing should have superior quality with good smooth finish.</td>
</tr>
<tr>
<td>4.10</td>
<td>Seal design</td>
<td>Seal should be constructed/moulded with one piece twisted sealed wire &amp; polycarbonate male &amp; female part such way that no extra seal wire is required.</td>
</tr>
<tr>
<td>4.11</td>
<td>Surface finish</td>
<td>The surface should be free from any burr or casting voids etc.</td>
</tr>
<tr>
<td>4.12</td>
<td>Colour shade</td>
<td>The colour shades of all seals of specific color should be same. The color code will be provided by JKPDD.</td>
</tr>
</tbody>
</table>

### GENERAL CONSTRUCTIONS

5.0.1 The seal shall be capable to withstand temperature upto 147 deg. C without any damage / deformation.

5.0.2 The seal shall be designed for a single use only and if tampered with the help of plier, knife or any other sharp instruments, the seal shall be damaged and due to its transparent property, the sign of internal tampering shall be easily detected. Also once opened, it cannot be re-used.

5.0.3 The seal shall be made in such a way that, it can be easily locked with the help of finger and thumb pressing no tools shall be required to close the seal in the laboratory or at site.

5.0.4 Both the parts shall be designed in such a way that they cannot be separated and the attachment shall be flexible and shall not break. After inserting the seal wire through female part, the cap of the male part shall be fitted in the female part in such a way that it should not leave any space to avoid insertion of any sharp tools for opening of seal body of the female part in hot or cold condition.

5.0.5 The seal shall have also the following features:-
   a. Tamper resistance and reliable.
   b. Environmentally safe as it does not contain any lead.
   c. Withstand long-term exposure to direct sunlight.
   d. Required no tools for installation.
   e. Transparent.
   f. Heat resistance.

### Design

5.1.1 The seal shall be anchor (Push Fit) type tamper evident with double locking.

5.1.2 There shall not be any change in size, shape or design of the seal than the approved tender samples. If the seal is found different than the approved design / shape / size, the same shall be out rightly rejected.

5.1.3 The double anchor should not be so soft that it can be easily pressed before sealing, so that after pressing the seal cannot be opened.

5.1.4 The double anchor should be very hard such that it should not require plier to press fit. Should be easily press fit with hand/ thumb pressure.
5.1.5 The wall thickness of seal should be minimum one mm (1mm).

5.1.6 Seal shall be made of unbreakable, high grade, fire retardant reinforced Insulating material with FV0 Fire Retardant, self-extinguishing, UV stabilise, recyclable and Anti oxidation properties.

5.1.7 Non repeat seven digits Sr. No. With Code No. shall be laser etched / embossed during moulding (it shall not be screen printed) in contrast color on one side of capsule body (female).

5.1.8 The Sr. No. shall also be laser etched / embossed during moulding (it shall not be screen printed) in contrast color on top of the male part.

5.1.9 The laser etched printing shall be through complete thickness of the polycarbonate.

5.1.10 Hole for inserting sealing wire of diameter of 1mm only with \( \pm 0.1 \) mm tolerance.

5.2 Color of Seal

5.2.1 The female portion of the Polycarbonate Seal(s) shall be available in Clear color and should be transparent (see through) type, which shall give complete visualization of its fixing mechanism and shall show clear indication if tampered.

5.2.2 Male part Anchor type body may be in colors of Red / Yellow/ Green/ Violet/ Orange. The color of seal should not fade with UV radiations of sunlight.

5.2.3 The color should be such that any two seals should not show any visual color shade difference.

5.2.4 The required shade of color shall be given/mentioned in the PO.

5.3 Marking/ Monogram

The seal shall have laser etched printing of monogram of JKPDD on front side and month and year embossed of manufacture in figure on the backside. The laser etched printing should be through complete thickness of polycarbonate.

5.4 Seal material

The raw material used for polycarbonate plastic seals shall be M/s GE plastic, (Grade 143R or 943 AA), any other equivalent manufacturer having similar material properties as under:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Item</th>
<th>Polycarbonate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Melting Temperature</td>
<td>2800 C to 2950 C</td>
</tr>
<tr>
<td>2</td>
<td>USE</td>
<td>Engineering</td>
</tr>
<tr>
<td>3</td>
<td>Softness</td>
<td>Hard</td>
</tr>
<tr>
<td>4</td>
<td>Durability</td>
<td>Weather effect resistant</td>
</tr>
<tr>
<td>5</td>
<td>Transparency</td>
<td>Fully Transparent (long time transparency)</td>
</tr>
</tbody>
</table>

5.5 Seal Wire

The non-corrosive, non-magnetic stainless steel twisted wire (26 guage) confirming to

IS : 280 shall be used. The seal wire shall not have effect of magnet i.e. it should not attract to magnet. The length of the sealing wire should be minimum 6” twisted two strand pull resistant.
stainless steel wire fixed to the seal. The diameter of each individual stand should be of 0.46mm (26 gauge) to 0.5 mm dia and overall diameter of the seal wire shall be 0.92 to 1.0 mm (+0.05). The No. of turns shall be minimum 20 per inch. The seal wire should be inserted at the female and male part during the process of moulding itself and with a visible projected and continuously length of the wire. The wire shall be intact such that it cannot be pulled out after sealing.

The seal wire insert hole should be just sufficient for passing the seal wire and hole of larger dia. is discouraged.

5.6 Tolerance
Any dimension Tolerance shall be max. 0.5mm or below.

5.9 Special feature
A secret code shall be given in each seal by bidder on whom the RECPDCL places the order. The name of the bidder embossed/laser printed on the seals along with JKPDD logo, Sr. No., Month and Year of manufacture or any other symbol given by the JKPDD shall be embossed/ laser printed. Before commencing mass manufacturing & supply Six Nos. of sample seals of each color shall have to be approved from the purchaser.

5.1 Patent
Seals should be patented or design is registered with patent office. Copy of patent certificate /lease & patent drawing/design should be submitted for verification along with the offer. This should comply to the latest CEA guidelines & its Bidders responsibility to provide genuine documents complying to statutory guidelines.

6.0 NAME PLATE AND MARKING
Seals shall have embossed marking clearly visible and effectively secured against removal. Following marking to be done on seals.

i. Manufacturer’s name on female part side below date & month
ii. Serial number – unique seven digit no (Seal serial number shall be laser printed on top of the male part & bottom of the female part).
iii. JKPDD monogram with logo on high-rise moulding in 8mm dia. On side of female part
iv. Month and Year of manufacture in MM/YY format on other side of the female part in high-rise moulding in 8mm dia.

7.0 TESTS
All routine, acceptance & type tests shall be carried out on the seals separately in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted

7.1 TYPE TEST
As per acceptance tests.

7.2 ROUTINE TEST
1. Dimension check – Dimensions as per approved GTP & within min. tolerances in specs.
2. Surface finish- Male & female part – The surface should be free from any burr or casting voids etc.
3. Embossing quality- embossing should have superior quality & good finish.
4. Colour shade- the colour shades of all seals of specific color should be same.
5. The steel seal wire shall be properly placed in insulating material.

7.3 ACCEPTANCE TEST
The seals shall be inspected / tested as a acceptance test at the manufacture's works before dispatch in presence of authorized representative of purchaser for the following tests:

i) Physical Dimensional Check-up : The seals shall be subjected to visual check-up for verification of workmanship and other features as mentioned above including shape / design.
/ dimensions as per approved drawing /Samples & dimensions should be within min. tolerances mentioned in specs./drawings.

ii) Boiling Water Test: The seal when immersed in the boiling water for two hours there shall not be any effect on the seal and it shall remain intact condition i.e. the seal should not become soft, but instead should turn out to trail and easily break thus showing easily the tampering signs if it eventually happens. Even, with the help of any sharp instrument, pulling with plier i.e. by applying mechanical force, the male portion shall not come out from the female part (body seal). In case, it comes out, the same shall damage the seal, so that it cannot be re-used.

iii) Pull Out Test: After locking the seal, if the male part / insert is pulled with mechanical force with the help of plier or any other instrument, sharp instrument etc. at normal condition, the seal should not get unlocked without any damage and when such condition occurs, it should leave traces of tampering.

iv) Seal Wire : In case, if someone tries to pull the seal wire and in any of the tests as mentioned above at (ii) & (iii) in that case the male / female portion of the seal should be damaged and the same can be seen visually being a transparent one.

v) Chemical Test: The seal be kept in the concentrated acid for minimum one hour. The same shall remain in tact condition and if try to unlock the seal, the same shall be damaged.

vi) Temperature withstand test: The seal should be capable to withstand temperature up to 147 deg. C without damage/deformation.

vii) Effect of oil, chemical & sunlight : The seal shall be so designed made that there shall not be any effect of temperature, chemicals, oil and sunlight etc. on the performance of the seal.

Other checks -
1. Surface finish- Male & female part – The surface should be free from any burr or casting voids etc.
2. Embossing quality- embossing should have superior quality & good finish.
3. Colour shade- the colour shades of all seals of specific color should be same.
4. Marking & embossing - The LOGO embossing shall be as per JKPDD standard logo & making as mentioned in specs. The steel seal wire shall be properly placed in insulating material.

In short, if the seal is tested for any of the above tests, in no condition the male and female part shall be separated out without affecting / damaging the seal. In case, if they are separated, the seal shall have sufficient tamper evident. Also, if seal wire is pulled out from the seal in any of the above tests, it shall not come out from the seal without damaging seal.

7.4 Sampling Plan

For carrying out above acceptance tests at manufacturer's works shall be Selected at the rate of 0.2% of the offered quantity with minimum 5 samples selected at random from the each lot offered as per IS4905. The seals used in testing shall be destroyed in the presence of JKPDD Inspecting Officer.

8.0 TYPE TEST CERTIFICATE

The bidder shall furnish the type test certificates of the meter for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI or ERDA or UL or accredited laboratory as per the relevant standards. Testing from any national approved laboratory or international acclaimed lab or equivalent will also suffice at the discretion of RECPDCL. Type test should have been conducted in certified Test Laboratories during the period not exceeding 5 years.
from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to RECPDCL.

<table>
<thead>
<tr>
<th>9.0</th>
<th>PRE-DESPATCH INSPECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The successful bidder shall submit Six samples of each color seal (non-returnable) mentioned in tender/ PO for further testing and compliance as per specifications and getting approval before mass manufacturing. Out of Six samples, five samples to be submitted in Meter testing lab and one in RECPDCL.</td>
</tr>
<tr>
<td></td>
<td>Inspection may be made at any stage of manufacture at the discretion of the purchaser and if found unsatisfactory as to workmanship or material, the same is liable to rejection. Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Bidder shall grant free access to the places of manufacture to RECPDCL's representatives at all times when the work is in progress. Inspection by the RECPDCL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by RECPDCL.</td>
</tr>
<tr>
<td></td>
<td>Following documents shall be sent along with material</td>
</tr>
<tr>
<td></td>
<td>a) Test reports</td>
</tr>
<tr>
<td></td>
<td>b) MDCC issued by RECPDCL</td>
</tr>
<tr>
<td></td>
<td>c) Invoice in duplicate</td>
</tr>
<tr>
<td></td>
<td>d) Packing list</td>
</tr>
<tr>
<td></td>
<td>e) Drawings &amp; catalogue</td>
</tr>
<tr>
<td></td>
<td>f) Guarantee / Warrantee card</td>
</tr>
<tr>
<td></td>
<td>g) Delivery Challan</td>
</tr>
<tr>
<td></td>
<td>h) Other Documents (as applicable)</td>
</tr>
</tbody>
</table>

| Stage Inspection: If desired by RECPDCL, RECPDCL will arrange stage inspection for the material used for manufacturing of seal and also during the process of manufacturing. If desired, during the surprise checking RECPDCL shall take sample of raw material and will check for the material properties. In case, the same is not found as per the specification, the entire lot under process shall be rejected. |

<table>
<thead>
<tr>
<th>10. 0</th>
<th>INSPECTION AFTER RECEIPT AT STORE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The material received at Purchaser’s store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or approved GTP &amp; drawings and one copy of the report shall be sent to RECPDCL.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. 0</th>
<th>GUARANTEE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bidder shall stand guarantee towards design, materials, workmanship &amp; quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a period of at least 24 months from the date of commissioning or 30 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Company, failing which the purchaser will be at liberty to get it replaced/rectified at bidder's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the bidder or from the &quot; Security cum Performance Deposit&quot; as the case may be.</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>12.0</td>
<td>PACKING</td>
</tr>
<tr>
<td></td>
<td>The bidder shall be responsible for suitable packing of seals, colour wise. The bidder shall have to supply each 100 seals in chronological order i.e. arranging in serially, tied with the steel wire forming a loop and same shall be packed in polythene bag with labels furnishing serial no., colour etc. &amp; further packed in cardboard boxes for safety in transit.</td>
</tr>
<tr>
<td>13.0</td>
<td>TENDER SAMPLE</td>
</tr>
<tr>
<td></td>
<td>Bidders are required to manufacture 05 sample seals of each colour as per the RECPDCL specification and submit (non-returnable) the sample along with bid for approval. These samples to be submitted in Meter Testing Lab &amp; intimated to RECPDCL. The tender sample seals shall be provided with trademark and logo of firm on front side &amp; month and year of manufacturing on back side of the female part of the seal. The offer without samples shall be out rightly rejected and the offer shall not be considered. The samples seals shall be tested as per the specifications, either in RECPDCL’s laboratory or at third party govt approved laboratory, as per the discretion of RECPDCL. The tender sample seals not conforming to the specifications shall be straight war rejected and accordingly, their offer will not be considered for further evaluation.</td>
</tr>
<tr>
<td>14.0</td>
<td>QUALITY CONTROL</td>
</tr>
<tr>
<td></td>
<td>The bidder shall submit with the offer Quality assurance plan indicating the various stages of internal factory inspections, tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and after finishing final product. Quality should be ensured at the following stages:</td>
</tr>
<tr>
<td></td>
<td>- Inwards raw material</td>
</tr>
<tr>
<td></td>
<td>- At Female part moulding along with seal wire</td>
</tr>
<tr>
<td></td>
<td>- At male part moulding with seal wire</td>
</tr>
<tr>
<td></td>
<td>- On finished product</td>
</tr>
<tr>
<td></td>
<td>- Prior to packing</td>
</tr>
<tr>
<td></td>
<td>The RECPDCL’s engineer or its nominated representative shall have free access to the bidder’s/manufacturer's works to carry out inspections of QAP.</td>
</tr>
<tr>
<td>14.1</td>
<td>IDENTIFICATION OF DUPLICATES</td>
</tr>
<tr>
<td></td>
<td>Supplier shall ensure that process cannot be duplicated to prevent duplicate seals. However, in case RECPDCL finds any doubtful seal at site, manufacturer shall visit the site for certifying whether the seals are genuine or duplicate. Manufacturer shall give a letter stating reason’s for duplicate and technical report needs to be provided along with conclusions. A copy of the report should be sent to Plant Egg Department.</td>
</tr>
<tr>
<td>15.0</td>
<td>MINIMUM TESTING FACILITIES</td>
</tr>
<tr>
<td></td>
<td>Bidder shall have adequate in house testing facilities for carrying out all routine tests &amp; acceptance tests as per relevant International / Indian standards/RECPDCL specification. The bidder shall have good/digital/calibrated instruments to check minute difference in dimensions &amp; logo etc.</td>
</tr>
<tr>
<td>16.0</td>
<td>MANUFACTURING ACTIVITIES</td>
</tr>
<tr>
<td></td>
<td>The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.</td>
</tr>
</tbody>
</table>
17. SPARES, ACCESSORIES AND TOOLS
Not Applicable

18. SEAL WITH TRACKING & RECORDING SOFTWARE
As per JKSEM Code regulation 2007 regulation 16.12(1)(b), seal tracking and recording software for all new seals shall be provided by the meter manufacturer. The software shall have following features
- Software should have facility of defining the system controller
- Facility to enter serial number of seals with the help of bar code scanner.
- Receiving of seal in the system and with authentication like signature.
- Facility to identify the concern who is responsible for receiving of seals and nominated by system supervisor.
- Provision to define different type of seals for various uses.
- Software should have facility of report generation for inventory & issue records.
- Facility to track for relevant data for individual seal entered in the system.

19. DRAWINGS AND DOCUMENTS
Following drawings & Documents shall be prepared based on RECPDCL specifications and statutory requirements and shall be submitted with the bid:

- a) Completely filled-in Technical Parameters.
- b) General arrangement drawing of the meter
- c) Terminal Block dimensional drawing
- d) Mounting arrangement drawings.
- e) General description of the equipment and all components with makes and technical requirement
- f) Type Test Certificates
- g) Experience List
- h) Manufacturing schedule and test schedule

After the award of the contract, soft copies or hard copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>For Approval</th>
<th>For Review Information</th>
<th>Final Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Technical Parameters</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>General Arrangement drawings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>Manual/Catalogues</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>Transport/Shipping dimension drawing</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>QA BOC Plan</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>Routine, Acceptance and Type Test Certificates</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

All the documents & drawings shall be in English language.

Instruction Manuals (If applicable) : Bidder shall furnish softcopies and one hard copies of nicely bound manuals (In English language) covering instructions for use & application and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices if any.
20.  GUARANTEED TECHNICAL PARTICULARS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>PARTICULARS</th>
<th>TO BE FURNISHED BY BIDDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name &amp; address of manufacturer</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Work's address</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Raw material of polycarbonate seals</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>UV resistance properties</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seal shall not be affect by boiling water &amp; acid</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Seal should have 6 inch long 26 gauges, twisted strand stainless steel wire non corrosive &amp; non magnetic</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Max. Withstand temperature (upto 147 deg.c.)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Thickness of seal</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Serial number should be laser printed on male &amp; female part &amp; should be separately visible after closing of seal</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Embossing of monogram is as Per specification</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Colour of the seals</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Seal should be constructed/moulded with one piece twisted sealed wire &amp; polycarbonate male &amp; female part such way that no extra seal wire is required.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Seal design should be such that once seal is closed, the two parts should not be separated.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Seal should permanently secure steel wire inside seal after closing of male &amp; female part.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Seal should have positive locking &amp; locking should be easy &amp; should be possible with pressure of thumb.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1. Surface finish- Male &amp; female part – The surface should be free from any burr or casting voids etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Embossing quality- embossing should have superior quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Colour shade- the colour shades of all seals of specific color should be same.</td>
<td></td>
</tr>
</tbody>
</table>
### 16. Guarantee of seal

### 17. SEAL IS PATENTED
(Provide patent no. & patent drawing/design along with COPY OF PATENT certificate.

### 18. Seal wire details

### 19. Supplier should have supplied minimum 1 lakh such seals to power utility. Give details.

### 20. a. Color of female part  
   b. Color of male part

### 21. Manufacturer specific secret code - (Yes/No)

### 21. SCHEDULE OF DEVIATIONS

(TO BE ENCLOSED WITH THE BID)

All deviations from this specification shall be set out by the Bidders, clause by clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Clause No.</th>
<th>Details of deviation with justifications</th>
</tr>
</thead>
</table>

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:
## 22 AUTHORISED SUPPLY UNDERTAKING

**[TO BE ENCLOSED WITH THE BID]**

On award of contract the bidder should not sell or offer the seals with JKPDD logo to any unauthorized person outside RECPDCL in any circumstances.

We confirm that we or any our company representative shall not offer to sell the JKPDD logo seals to any unauthorized person outside RECPDCL.

Seal of the Company:

<table>
<thead>
<tr>
<th>Signature</th>
<th>Designation</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Signature</th>
<th>Designation</th>
</tr>
</thead>
</table>
5.1 **Insulation Piercing Connectors (IPC)**

5.1.1 Insulation Piercing Connectors (IPC) are used for making Tee/Tap-off/Service connectors to an ABC/Bare Overhead Line.

5.1.2 Insulation Piercing Connectors are designed to make a connection between the uncut main conductor and a branch cable conductor without having to strip either cable to expose the conductor instead the tightening action of the IPC will first pierce the Insulation, then make good electrical contact between the main end and branch conductor while simultaneously insulating and sealing the connection.

5.1.3 **Constructional Features of IPC**

5.1.3.1 The housing shall be made entirely of mechanical and weather resistant plastic insulation material and no metallic part outside the housing is acceptable except for the tightening bolt.

5.1.3.2 Any metallic part that is exposed must not be capable of carrying a potential during or after connector installation.

5.1.3.3 Screws or nuts assigned for fitting with IPC (Insulating Piercing connector), must be fitted with torque limiting shear heads to prevent over tightening or under tightening (min & max torque values to be specified by Manufacturer).

5.1.3.4 The IPC must perform piercing and connection on Main and Branch cable simultaneously.

5.1.3.5 The IPCs shall be water proof and the water tightness shall be ensured by appropriate elastomer materials and not by grease, gel or paste alone.

5.1.3.6 Design of IPC should be such as to not cause damage to insulation of adjacent conductors due to vibration and relative movement during service.

5.1.3.7 The connector shall have a rigid removable end cap which can be slide fitted onto the main connector body on either right or left by the installer (depending on site requirement) for sealing the cut end of the branch cable. Once the connector is fitted, it should not be possible to remove the cap without removing the connector.

5.1.3.8 All the metallic parts of the connector should be corrosion resistant and there should not be any appreciable change in contact resistance & temperature after overloads & load cycling.

- The contact plates should be made of **aluminium alloy**.
- Connector teeth should be factory greased & sealed to retard water or moisture ingress & corrosion.
- The Insulation material should be made of weather & UV resistant reinforced polymer.
- The outer metallic part should have potential free tightening bolts to allow safe installation on live lines.

5.1.4 **Mechanical Tightening and Electrical Continuity**

5.1.4.1 Connectors shall be tightened upto 70% of the minimum torque indicated by the Manufacturer. At this torque electrical contact should have occurred between conductors to be joined. Then connectors shall be tightened up to the breakdown of the shear heads and lastly, upto 1.5 times the maximum torque indicated by the manufacturer.
For the connector fitted with two screws on the same core, after the breakdown of the shear heads tightening may be carried out manually and alternatively using a torque meter. The test conditions shall be as close as possible to those defined for the use of the test machine as per NF-C standard.

5.1.4.2 At 1.5 times the maximum torque indicated by the manufacturer, there shall be no breakdown of any part of the connector or the core conductor.

5.1.4.3 Maximum rated torque shall not exceed 20 N.m for conductor <95 sq.mm and 30 for >95 but <150 sq.mm.

5.1.4.4 Tightening screws shall have hex. Heads of 10 mm, 13 mm or 17 mm only.

5.1.5 Effect of Tightening on Main Core of IPC

5.1.5.1 The connector shall be fitted approx. at the centre of the main core, which is secure between two anchoring points 0.5 mtr. To 1.5 mtr. apart. At the time of fitting the connectors, the main core shall be under longitudinal tension at 20% of the load indicated in Table 1:

<table>
<thead>
<tr>
<th>Nominal Cross – section (sq.mm.)</th>
<th>Tensile Strength (Newton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1200</td>
</tr>
<tr>
<td>25</td>
<td>1800</td>
</tr>
<tr>
<td>35</td>
<td>2500</td>
</tr>
<tr>
<td>50</td>
<td>3500</td>
</tr>
<tr>
<td>70</td>
<td>5000</td>
</tr>
<tr>
<td>150</td>
<td>10000</td>
</tr>
</tbody>
</table>

5.1.5.2 Tensile strain shall be increased to the full value indicated in the Table 1 and held minute. There should be no breakdown of the core conductor.

5.1.6 Effect of Tightening on Branch Core of IPC

5.1.6.1 Test specimen shall be made up as in clause 5.1.5.1 except that this shall be do the smallest cross sections of main and branch conductors within its range.

5.1.6.2 An increasing tensile load shall be applied to the Branch Conductor along the axis of the recess for the Branch cable. Load shall increase at 100 – 500 N/minute until it reaches the value specified in the Table 2 and maintained for 1 minute.

<table>
<thead>
<tr>
<th>Nominal Cross – section (sq.mm.)</th>
<th>Tensile Strength (Newton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 (Alu)</td>
<td>290</td>
</tr>
<tr>
<td>25</td>
<td>450</td>
</tr>
<tr>
<td>35 &amp; above</td>
<td>500</td>
</tr>
</tbody>
</table>

5.1.6.3 No slippage or breaking of conductor shall occur.

5.1.7 Dielectric & Water Tightness Test of IPC

5.1.7.1 The connector is tightened up to the minimum torque indicated by the manufacturer.

5.1.7.2 Connectors are mounted on

- Minimum cross section of main core.
5.1.7.3 Maximum cross section of main core.

In each case Branch is of minimum cross section.

5.1.7.4 Protection caps for the branch cable are to be used in accordance with the requirements of clause 5.1.3.7. An additional water tight cap of any design may be used to seal one end of the main cable if it is immersed under water. No additional gel or any protection is to be provided while installing connector.

5.1.7.5 The entire assembly shall be immersed at a depth of approx. 30cms. For 30 minutes with the free ends of main and branch cable out of the water.

5.1.7.6 An AC voltage of 6 kV shall be applied between the water bath and each of the cores in turn for 1 minute. There shall be no flashover or electrical tripping with a trip setting of 10 mA + 0.5mA.

5.1.8 Electrical & Ageing Test of IPC

5.1.8.1 Two test configurations are used according to Table 3 with the connections tightened to the minimum torque specified by their manufacturers and resistance recorded.

<table>
<thead>
<tr>
<th>Table - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
</tr>
<tr>
<td>1st Configuration</td>
</tr>
<tr>
<td>2nd Configuration</td>
</tr>
</tbody>
</table>

5.1.8.2 The configurations are subjected to 200 heat cycles by injecting suitable current into them. In each cycle the temperature of the conductor shall be raised from ambient to 120 + 5°C as, measured by a thermocouple.

5.1.8.3 The duration of each heating cycle is chosen to maintain a sufficiently steady temperature of 120 + 5°C for 15 minutes. The duration of each cooling cycle is chosen to bring the conductor temperature to within 2°C of ambient.

5.1.8.4 Nominal heating current is indicated in the Table-4. It shall be permissible to accelerate the temperature rise by using a current up to 1.5 times the nominal current and to accelerate the cooling period by use of a fan or air blower.

<table>
<thead>
<tr>
<th>Table-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Cross – section (sq.mm.)</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>35</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>95</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>150</td>
</tr>
<tr>
<td>185</td>
</tr>
<tr>
<td>240</td>
</tr>
</tbody>
</table>

5.1.8.5 The over current test of Clause 5.1.9 shall be done after 50 cycles if the connector is a safety connector designed to ground a phase connector while the line is being worked on.

5.1.8.6 At the end of the 200 cycles the resistance shall again be measured. It shall not differ from the initial value by more than 12%.
5.1.9 *Over Current Test of IPC*

5.1.9.1 Over current test is required to establish the performance of Safety Connectors that are intended to provide a safe path to ground for the phases while the line is de-energised for working. It establishes the performance of the connector under short term over load conditions.

5.1.9.2 After the first 50 cycles of clause 5.1.8, the connectors are subjected to 4 over currents of 1 sec duration each.

5.1.9.3 The conductor temperature at the start of the over current test should be not more than 35ºC.

5.1.9.4 Current density during over current shall be 100 A/sq.mm for Aluminium and 95 A/sq.mm for Aluminium – Alloy Conductor.

5.1.9.5 Variation in time of over current is permissible between 0.85 sec & 1.15 sec., provided if maintains the relationship I2

\[ t = K \]

\[ I = \text{rms value of over current in Amps.} \]
\[ t = \text{time in seconds} \]
\[ K = \text{Constant} \]

5.1.9.6 After the over current test the electrical ageing test of clause 5.1.8 shall be resumed.

5.1.10 *Type Test of IPC*

5.1.10.1 Type Test Reports should be submitted from an Independent Laboratory of Repute or the Works Laboratory in case of a foreign manufacturer covering the following (on any convenient size of fitting of same design made from the same materials).

5.1.10.2 The installation of the connectors shall be done by the laboratory following instructions provided by the manufacturer.

5.1.10.3 The Test report shall record the embossing and marking on the connector.

5.1.10.4 The following shall constitute Type Tests for IPC:

- Electrical Ageing Test
- Dielectric and Water Tightness Test
- Mechanical Tightening Test
- Effect of Tightening on main Core
- Effect of Tightening on Branch core
- Over-current Test (if applicable)

The following shall be Type Test for Suspension Assembly (SA)

- Mechanical Test
- Voltage Test
- Climatic Aging Test
- Corrosion Test
- Endurance Test under Thermal & Mechanical Stresses

The following shall be Type Tests for Anchoring Assemblies (AA)

- Mechanical Test
- Voltage Test
- Dynamic Test
- Climatic Aging Test
- Corrosion Test
- Endurance Test under Thermal & Mechanical Stresses
5.2 Anchoring Clamp for Insulated Messenger:

The clamps should be designed to Anchor LT-AB cable with insulated messenger. The clamp should consists of an Aluminium alloy corrosion resistant castled body, bail of stainless steel and self adjusting plastic wedges which shall anchor/hold the neutral messenger without damaging the insulation.

- No losable part in the process of clamping arrangement
- The clamp should conform to the standard NFC 33041 and 33042 or equivalent I.S. if any.
- The clamp body should be made of corrosion resistant Alluminiaum alloy, bail should be of stainless steel and wedges should be weather and UV resistant polymer.
- Ultimate tensile strength of the clamp should not be less than 15 km for 50/70sq.mm insulated messenger wire / 10 KN for 25/35 sq.mm insulated messenger wire.
- Slip load of the clamp should not be less than 3 KN for 50/70 sq.mm. messenger wire / 2 KN for 25/35 sq.mm. messenger wire.

5.2.1 Anchoring assemblies are used to firmly attach the messenger of ABC to a support and transmit the mechanical tension.

- at the end of a run or to the supporting structures
- at a major change in direction.

5.2.2 Each Anchoring Assembly shall include.

- One number tension bracket.
- One number wedge type tension clamp
- Flexible Rope for fixing tension clamp to bracket.

5.2.3 Anchoring assemblies shall be supplied in sets to ensure compatibility of the materials against corrosion or wear of moving parts.

5.2.4.1 The tension bracket shall be made out of a single piece of Aluminium alloy suitable for attachment to a pole either by

a) 16mm galvanized steel bolt (s) or
b) two stainless Steel straps of 20 x 0.7 mm.

5.2.4.2 The tension bracket should be designed to ensure the Flexible rope cannot slip out at any angle.

5.2.4.3 The tension bracket should be rated and tested for the loads specified in Table-5. The load shall be applied at an angle of 45º from the normal to the surface of mounting of the bracket.

<table>
<thead>
<tr>
<th>Conductor Size (Sq.mm.)</th>
<th>Rating</th>
<th>Load for deformation &lt;10mm (Newtons)</th>
<th>Load for deformation &lt;30mm &amp; no-break (Newtons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-35</td>
<td>1500 Kg.</td>
<td>12,000</td>
<td>15,000</td>
</tr>
<tr>
<td>50-95</td>
<td>2000Kg</td>
<td>15,600</td>
<td>19,500</td>
</tr>
</tbody>
</table>

5.2.5 Flexible Rope of AA

5.2.5.1 The Anchoring assembly shall be supplied with a stainless steel flexible Rope to connect the Tension Clamp to the Tension Bracket.

5.2.5.2 The rope should have sufficient flexibility to ease the torsional movement of the ABC System.

5.2.5.3 The Rope should be pre-fitted with compression type end fittings to secure the tension clamp.
5.2.5.4 A wear resistant moveable saddle should be un-loosably fitted on the Rope to prevent abrasion at the point of fitting into the tension bracket.

5.2.5.5. The Rope should have sufficient mechanical strength to withstand the mechanical test for the complete assembly tests in this specification.

5.2.6 Wedge Type Tension Clamp of AA

5.2.6.1 Wedge type clamps shall be used for clamping the messenger without damaging the insulation.

5.2.6.2 The clamp shall be capable of clamping an uncut messenger so that it can continue without break to the connecting point or next span.

5.2.6.3 The clamp shall be fully insulating type of mechanical and weather resisting thermoplastic.

5.2.6.4 No bolts or loose parts are allowed as part of the Clamping system.

5.2.6.5 No tools shall be needed for fitting the messenger into the clamp.

5.2.6.6 The clamp shall be self tightening and capable of holding without slippage the load specified in the Table-6.

<table>
<thead>
<tr>
<th>Table - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor Size</td>
</tr>
<tr>
<td>Sq. mm.</td>
</tr>
<tr>
<td>25-35</td>
</tr>
<tr>
<td>50-54</td>
</tr>
<tr>
<td>70-95</td>
</tr>
</tbody>
</table>

5.2.6.7 After fitting the insulated messenger in the clamp, load T start will be held for 1 minute & then load increased to T final at rate between 5000 – 7,500 N/mtr. In each case there shall be no breakdown of any part of clamp and slippage of messenger in relation to the clamp.

5.2.7 Voltage Test on Clamp of AA

5.2.7.1 Voltage test is carried out on anchor clamps to ensure no damage is caused to the insulated messenger.

5.2.7.2 A conductive rod of dia. corresponding to the average dia. that can be accommodated in the clamp is fitted into the clamp, protruding by approx. 50mm at each end of the tightening piece.

5.2.7.3 The rod and clamp is subjected to tensile load as stated in Table 7 below when fixed to a support in its normal manner.

<table>
<thead>
<tr>
<th>Table - 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor Size</td>
</tr>
<tr>
<td>Sq. mm.</td>
</tr>
<tr>
<td>25-35</td>
</tr>
<tr>
<td>50-54</td>
</tr>
<tr>
<td>70-95</td>
</tr>
</tbody>
</table>

5.2.7.4 A power frequency voltage of 6 kV is applied for 1 minute between the rod and conductive part of the clamp, or fixation point in absence of conductive part.
5.2.7.5 No breakdown or flashover shall occur. There shall be no tripping due to leakage with a setting of 10 + 0.5 mA.

5.2.8 Endurance under Mechanical & Thermal Stress of AA

5.2.8.1 This test is done on clamp rated 1500 Kg. or 2000 Kg. using insulated messenger 50 to 70 sq. mm.

5.2.8.2 A neutral messenger is fitted between two anchor clamps, with clamp spacing approx. 5 mtr. & 1 mtr. Of messenger protruding from the end. Marks are made to enable measurement of slippage.

5.2.8.3 The sample is subjected to 500 cycles of 90 minutes each as described below:

5.2.8.3.1 Messenger temperature is raised by passing an AC current to 60 +3°C within 15 minutes. This temperature is maintained for at least 30 minutes to give a total heating period of 45 mts.per cycle.

5.2.8.3.2 Messenger is allowed to cool naturally to ambient for further 45 minutes to complete 90mts. Cycle time.

5.2.8.3.3 Mechanical load is applied during the cycle as per table 8 below. Load F1 is applied throughout the cycle, except for a short period of 5 sec. to 60 sec. when it is gradually increased from F1 to F2 at any time during the last 15 minutes of the 90 minute cycle.

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Rating (Kg.)</th>
<th>F1 (Newton)</th>
<th>F2 (Newton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sq. mm. Dia. (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35 8-11</td>
<td>1000 Kg.</td>
<td>2,200</td>
<td>5,000</td>
</tr>
<tr>
<td>50-54 8-11</td>
<td>1500 Kg.</td>
<td>4,000</td>
<td>7,500</td>
</tr>
<tr>
<td>70-95 13.5-16</td>
<td>2000 Kg.</td>
<td>4,500</td>
<td>10,000</td>
</tr>
</tbody>
</table>

5.2.8.3.4 There should be no slippage greater than 4 mm after 2 cycles or greater than 8 mm after 500 cycles.

5.2.8.3.5 Voltage test is done at the end of the 500 cycles by immersing the test specimen of neutral messenger and clamps in water of resistivity not less than 200 Ohm mtr. For 30 minutes.

5.2.8.3.6 A voltage of 10 kV ac is applied for 1 minute between messenger and water bath using a trip setting of 10 + 0.5 am. There should be no breakdown or tripping.

5.3 Suspension clamp for insulated neutral messenger:

The clamp should be designed to hang L.T – AB cable with insulated neutral messengers. The neutral messengers should be fixed by an adjustable grip device. A movable link should allow longitudinal and transversal movement of the clamp body.

- No losable part in the process of clamping arrangement.
- The clamp should conform to the standard NFC 33040 or equivalent I.S, if any.
- The clamp and the link made of Polymer should provide an additional insulation between the cable and the pole.
- The clamps and movable links should be made of weather and UV resistant glass fibre reinforced polymer.
- Clamps should be fixed with pole by eye hook / bracket. Bracket should be made of corrosion resistant alluminium alloy.
- Ultimate tensile strength of the clamp should not be less than 15 KN for 50/70 sq.mm. Insulated messenger wire 4.3 KN for 25/35 sq.mm. Insulated messenger wire.
- Maximum allowable load of the clamp should not be less than 20 KN for 50/70 sq.mm. insulated messenger wire/15 KN for 25/30 sq.mm insulated messenger wire.
5.3.1 Suspension Assembly is used for supporting an ABC by installation on the messenger at an intermediate point of support such as a pole. It can accommodate small angles of deviation up to 30°.

5.3.2 Each Suspension Assembly shall consist of:
- One number Suspension Bracket.
- One number moveable (articulated) connecting link.
- One number Suspension Clamp.

5.3.3 Suspension Assemblies shall be supplied in sets to ensure compatibility of the materials against corrosion or wear of rotating/moving parts.

5.3.4 Suspension Bracket of SA

5.3.4.1 The Suspension Bracket shall be made from single piece alluminium alloy suitable for attachment to a pole by either.
   a) 16 mm galvanized steel bolt or
   b) Two stainless steel straps.

5.3.4.2 The Suspension Bracket shall be provided with an upper bulge to prevent the clamp from turning over on the Bracket for more than 45° from the horizontal or to within less than 60 mm from the pole / fixing structure.

5.3.4.3 The Suspension Bracket should be so designed to ensure that the articulated link cannot slip out of it.

5.3.4.4 Suspension Brackets shall be designed to withstand a load applied at the anchoring point of the movable link as per Table – 9 below without deformation of more than 10mm or breakdown at 330 below horizontal (there should be no longitudinal component of load parallel to the plane of fixing).

| Table - 9 |
|---------------------|---------------------|---------------------|
| Conductor Size       | Normal rating (kg)  | Load (N)            |
| Sq. mm.              | Dia. (mm)           |                     |
| 25-35                | 8-11                | 1500Kg.             | 12500               |
| 70-95                | 13-17               | 2000Kg.             | 14000               |

5.3.5 Movable (Articulated) Link of SA

5.3.5.1 Movable Links are used between the Suspension Bracket and Suspension Clamp to allow a degree of movement and flexibility between the two.

5.3.5.2 Moveable Links should be made fully of insulating type of mechanical and weather resistant thermoplastic. A metallic wear resistant ring should however be fitted at point of contact between the Suspension Bracket and the movable link.

5.3.5.3 The Movable link should be unloosably fitted to the Bracket and the Clamp.

5.3.6 Suspension Clamp of SA

5.3.6.1 Suspension Clamps are used for locking the messenger of the ABC bundle without damaging the insulation or allowing the messenger to become dismounted from the fitting.

5.3.6.2 The Suspension Clamp shall accommodate messenger wires from 25 to 95 sq.m.

5.3.6.3 The Suspension Clamp shall be made fully of insulating type of mechanically strong and weather resistant plastic.
5.3.6.4 Bolts should not be used for clamping / locking the messenger in the Clamp.

5.3.6.5 There shall be no losable parts in the Suspension clamp.

5.3.6.6 The Suspension Clamp should be unloosably fitted to the rest of the Suspension Assembly.

5.3.7 Mechanical Test on Clamp of SA

5.3.7.1 The Sub Assembly shall be subjected to a vertical load applied as per drawing in accordance with Table-10. There shall be no breakdown or permanent deformation at load T initial for 1 minute or when the load is increased to T final and released.

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Rating (Kg.)</th>
<th>T start (I minute) (Newtons)</th>
<th>T final (I minute) (Newtons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sq. mm.</td>
<td>Dia. (mm)</td>
<td>1500 Kg.</td>
<td>9,600</td>
</tr>
<tr>
<td>25-54</td>
<td>8-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-95</td>
<td>13-17</td>
<td>2000 Kg.</td>
<td>12,800</td>
</tr>
</tbody>
</table>

5.3.7.2 A sample messenger shall be fitted into a fixed suspension clamp and subjected to a gradually applied longitudinal load of 300 N. There shall be no permanent slip.
5.3.8 Voltage Test of SA
A copper foil is wrapped at the clamping point around the maximum size of messenger allowed in that clamp. An ac voltage of 6 KV is applied between the copper foil and nearest conductive point of the clamp or into its absence to the point of fixation. The voltage should be withstood for 1 minute without breakdown or flashover.

5.3.9 Test Under Mechanical & Thermal Stress

5.3.9.1 The test specimen is made up of approx. 10mts. Of messenger wire strung between two anchor clamps with a Suspension Clamp fixed in the middle. Masses of 40 Kg. are suspended at a distance of 1-2mtr. On either side of the Suspension Clamp with a fixing mechanism of mass 2 + 1 Kg.

5.3.9.2 The specimen is subjected to 500 cycles of 90 minutes each. Each cycle consists of the following:

a) For first 75 minutes a constant longitudinal tension of 4000 N is applied to the messenger for rating of 1500 Kg. and of 4500 N rating of 2000 Kg. while 64cycles right and left oscillation are produced on the clamp 32ºon either side of the vertical.

b) During the first 45 minutes an intermittent current of 4-5 A/sq.mm is applied to maintain the conductor temp at 60 + 3º C.

c) During the next 45 minutes of the cycle the conductor is allowed to cool down naturally to the ambient.

d) At the 75th minute, after having completed 64 oscillations, the oscillations are stopped and the longitudinal tension is increased to 7500 N for 1500 kg. Rating and 10000 N for 2000 Kg. Rating.

3.9.3 No messenger slippage should occur within the Suspension Clamp during the 500cycles.

5.3.9.4 At the end of the 500 cycles, the messenger is immersed in water for 30 minutes. It is then tested to withstand 10 kV ac for 1 minute with a trip setting of 10 + 0.5 mA. There should be no breakdown or flashover.

5.4 Acceptance Tests

5.4.1 The following shall constitute Acceptance Tests for Insulation Piercing Connectors(IPC):

- Visual *
- Dimensional (as per SCD and overall dimensions submitted with Tender Offer)*
- Electrical Ageing Test ***
- Dielectric and Water Tightness Test. **
- Mechanical Tightening Test **
- Effect of Tightening on Main Core **
- Effect of Tightening on Branch Core **

The above tests are to be carried out as per sampling plan below. However electrical geing test on IPC (market***) is to be done on only one connector of each type and size.

In case of random failure/defect, double the sample lot is to be drawn and there should be no failure/defect exceeding half the permissible defects (rounded down) shown in the chart.
<table>
<thead>
<tr>
<th>Lot Size</th>
<th>For tests Marked*</th>
<th>For tests Marked**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample Size</td>
<td>Max. permissible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defects</td>
</tr>
<tr>
<td>Upto 100</td>
<td>2</td>
<td>nil</td>
</tr>
<tr>
<td>101 to 1000</td>
<td>6</td>
<td>nil</td>
</tr>
<tr>
<td>&gt;1001</td>
<td>0.01% subject to</td>
<td>0.1% of pieces</td>
</tr>
<tr>
<td></td>
<td>min. 6 pieces</td>
<td>checked</td>
</tr>
</tbody>
</table>

5.4.2 The following shall constitute acceptance tests for Anchor Assemblies:
- Visual *
- Dimensional (as per SCD and overall dimensions submitted with Tender Offer) *
- Mechanical Test on Bracket **
- Mechanical Test on Clamp **
- Voltage Test *

5.4.3 The following shall constitute acceptance tests for Suspension Assemblies:
- Visual *
- Dimensional (as per SCD and overall dimensions submitted with Tender Offer) *
- Mechanical Test on Bracket **
- Mechanical Test on Clamp **
- Voltage Test *

The above tests (for AA & SA) are to be carried out as per sampling plan below. In case of random failure/defect, double the sample lot is to be drawn and there should be no failure/defect exceeding half the permissible defects (rounded down) shown in the chart.

<table>
<thead>
<tr>
<th>Lot Size</th>
<th>For tests Marked*</th>
<th>For tests Marked**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample Size</td>
<td>Max. permissible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defects</td>
</tr>
<tr>
<td>Upto 100</td>
<td>2</td>
<td>nil</td>
</tr>
<tr>
<td>101 - 500</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>501 - 2500</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>2501 &amp; above</td>
<td>10 + 0.2%</td>
<td>2 + 10% pf addl. Sample quantity</td>
</tr>
</tbody>
</table>
1. Hardware Requirements

1.1. General

This section describes the technical requirements of all the IT hardware envisaged in the BOQ for the data center of AMI implementation project. The minimum hardware specifications (RAM, Aux. Memory, interfaces etc.) for all equipment are specified in Technical Specification for Hardware. The bidder has to submit the details of the supplied hardware along with the bid as per format attached. The contractor shall assess the adequacy of hardware specified in the BOQ & if any additional hardware or higher end hardware configurations are required to meet all the requirements of the technical specifications, the same shall be included in the offer. The Bidder's proposal shall include necessary calculations to clearly establish that the proposed hardware meets the functional and performance requirements of the technical specification. Existing JKPDD Data centre is already equipped with uninterruptible power supply (UPS) and battery system enough to fulfil power supply requirement to control room equipment covered in present scope of work. However, it is the job of bidder to connect the existing UPS and battery system to data centre equipment.

The bidders are encouraged to optimize the requirement of hardware for servers and processors where one or more applications can be combined or distributed in any combination with adequate redundancy without affecting the performance requirement. However critical applications are to be hosted on independent hardware.

1.2. Technical Requirements for Hardware

All hardware shall be manufactured, fabricated, assembled and finished with workmanship of the highest production quality and shall conform to all applicable quality control standards of the original manufacturer and the Contractor. All hardware components shall be new and suitable for the purposes specified.

All hardware shall include self-diagnostic features. On restoration of power after interruption they shall resume operation automatically. All servers, workstations and network equipment (Switches, routers, firewall etc.) shall be compatible for remote monitoring using secure SNMP Ver. 3.0 or latest. All hardware shall support both IPv6 and IPv4 simultaneously.

The bidder shall ensure that at the time of final approval of hardware configuration and BOQ, all the hardware is as per the current industry standard models and that the equipment manufacturer has not established a date for termination of its production. Any hardware changes, except version upgrade in same series, proposed after contract agreement shall be subject to the following:-

- Such changes/updates shall be proposed and approval obtained from Employer along with the approval of Drawings/documents.
- The proposed equipment shall be equivalent or with better features than the equipment included in the Contract.
- Complete justification along with a comparative statement showing the original and the proposed hardware features/parameters including brochures shall be submitted to the Employer for review and approval.

Note:
- Changes/updates proposed will be at no additional cost to the Employer.
- The porting of software shall be at no additional cost in case of replacement of hardware during the Warranty period.

1.3. Hardware Configuration

In this technical specification all hardware has been broadly classified as “Server” and “Peripheral device”. The term “server” (also referred as “processor”) is defined as any general purpose computing facility used for hosting application functions as defined in the specification. The servers typically serve as the source of data, displays and reports. The term “Peripheral Device” is used for all equipment other than servers. Peripheral device includes workstation consoles, WAN router, LAN, firewalls etc. The redundant hardware
such as Servers, Firewall, and LAN etc. shall work in hot stand by manner. All the servers and networking equipment (Firewalls, LAN equipment etc.) shall be mounted in rack panel.

**Servers**

**Application Server**

The Servers shall have provision for expansion of the Processor, auxiliary memory and Main memory (RAM) by 100% of the delivered capacity. This expandability shall be possible at site with addition of plug in modules only. Further, a server management console shall be installed to access all servers centrally. Servers shall be mounted in a rack (panel) and a single rack mountable TFT monitor, keyboard and mouse using a KVM (switch to access all servers & peripherals) in the panel. However the grouping of servers in a rack shall be such that the primary and backup servers for a system function are located in different racks.

All servers shall have dual redundant power supplies, capable to operate on single power supply module. There shall not be any interruptions in the operation of servers when there is a failover between the two AC Power Supply of the server.

**Web Server**

Web server shall be provided to allow the access of system data (AMI/MDM), displays and reports by external users.

Web server is connected on one side to dual LAN and on other side to external network. Web server shall be provided with suitable firewalls on both sides in order to block the possible entry into AMI applications i.e. HES/MDM etc. by an intruder. It is required that both side firewalls are supplied from two different manufacturers & preferably of different technology.

Web server shall also be provided with host based Intrusion detection system (HIDS) and network based Intrusion prevention system (NIPS). The HIDS will be installed in the Web-server. The NIPS shall be installed for the AMI components/applications.

All necessary hardware & software for Web Servers with firewalls and HIDS/NIPS shall be supplied by the contractor.

A separate Computer shall be supplied to be used as Centralized management console for the HIDS/NIPS and firewall. The management console shall perform the following functions:

- create and deploys new policies
- collect and archive audit log for post event analysis
- maintain an Integrated Event Database
- Provide an integrated Reporting System.
- performance monitoring

**Networking Equipment**

**Firewall**

Firewalls shall be provided as per BOQ. It is required that both side firewalls (Internal and External) are supplied from two different manufacturers. All firewalls shall be hardware box firewall as per the requirements mentioned in Technical Specification for Hardware.
Routers

Routers shall be capable for data exchange between various communication media such as copper cable, PSTN/leased line, fibre optic cable, VSAT etc. Routers shall have the built-in firewall features as required. The routers shall be as per the requirements mentioned in Technical Specification for Hardware.

Router and firewall shall be provided with necessary license support till the completion of maintenance period.

All routers shall have G.703 ports as per the system requirement. There shall be 50% spare ports.

Necessary control should be applied on the router to stop unwanted traffic and attacks at the perimeter itself. In the secure configuration of a router, the following strategies should be considered.

- Deploy proper access management and avoid remote administration
- Enable Secret password.
- Change default SNMP community string
- ACLs (Access Control Lists) should include
  1. Apply egress/ingress filter
  2. Filter all RFC 1918, 3330 address space and special/reserved address
  3. Permit the required services for the required IP addresses only
  4. Deny everything else
- Turn on logging to a central syslog server
- Router for external world/internet connectivity shall support Multi-Homing (Single Link-Multiple IP addresses, Multiple Links-An IP address, Multiple links-Multiple IP addresses etc.) also in addition to above feature and shall have adequate number of ports to support it with minimum three internet service providers (ISP).

Host based Intrusion Detection System & Intrusion Prevention System (Network Based)

The bidder shall provide host based intrusion detection system & Intrusion Prevention system as per the parameters mentioned in this Technical Specification.

Local Area Network (LAN) and device interfaces

Servers and peripheral devices are connected to each other on local area network (LAN). LAN switches shall be as per the features mentioned in this Technical Specification.

Storage Area Network (SAN) based Storage

A SAN (Storage Area Network) based storage shall be provided which shall be sized adequately and shall be used for online storage and all online data backup. It shall be possible to take and store image backup of all servers & workstations on it. The SAN shall facilitate data storage for all applications and system of AMI.

Workstation Consoles

Workstation console shall consist of a workstation driving one or more monitors, a single wireless keyboard and a wireless mouse. The user shall be able to switch the keyboard and mouse, as a unit, among both the monitors at a console seamlessly.
Workstation consoles shall be used by the utility for control, monitoring and operation of different applications and other web interfaces. All workstation consoles shall support full-graphics displays.

Each workstation in the Control room shall be provided with two speakers for alarming as per Specification. In addition to the speakers, the Contractor shall provide all other interface hardware, such as cables and connectors as required.

1.4. Configuration Requirements

Every critical function must be supported by sufficient hardware redundancy to ensure that no single hardware and software failure will interrupt the availability of the functions for a period exceeding the automatic transfer time.

Replacement of faulty items of the system and its restoration shall not result in any loss of functionality or performance. The stand by elements of redundant system shall be fully monitored at all times. However, for non-critical functions hardware redundancy not required.

1.5. Error Detection and Failure Determination

All Servers, devices, applications, and maintenance functions in system shall be monitored for fatal and recoverable errors. All errors shall be recorded by the system for review by maintenance personnel. Each type of error (e.g., Server failure, memory access violation, device reply time-out, or message checksum error) shall be recorded separately with a date and time tag.

Server Errors

All fatal and recoverable errors of all Servers operating states shall be detected and recorded by the AMI system. Server failure shall be detected and annunciated to the user within 5 seconds of the failure.

Device Errors

All fatal and recoverable errors of all peripheral devices shall be detected and recorded. Each type of recoverable error shall be assigned a threshold by the programmer. Peripheral device failure shall be detected and annunciated within 5 seconds of the failure.

Software Errors

Execution errors in on-line and maintenance functions that are not resolved by program logic internal to the function shall be considered as fatal software errors. Fatal software errors shall result either in termination of the function or shall be handled as a fatal Server error. On the occurrence of each fatal software error, Server and operating system error codes and messages shall be recorded.

1.6. Hardware Redundancy and Configuration Management

Failure of primary server should be detected and system should automatically transfer to standby server. It should create alarms and errors files for the primary devices. All devices assigned to the failed Server shall be reassigned to its standby Server without any manual intervention. In case of non-recoverable errors servers should restart automatically in a defined time. Restart should initialize all other functions.

1.7. Technical Obsolescence

The systems which are at a risk of technical obsolescence over the operating life of the system should be identified; this should include end-of-sale and end-of-support policies governing the proposed technologies. Forward and backward compatibility need to be considered and mitigation options described in detail. The mitigation shall not be limited to periodic update from OEM/System supplier.
1.8. Power Supply for Control Centre equipment

The computer hardware system should be suitable for operation with single-phase, 240 +10% Vac, 50 +5% Hz power supply. The Contractor shall provide additional fuses, switches and surge protection, if necessary, to protect the computer system hardware.

1.9. Environmental Conditions

Equipment located in the computer/ control room shall operate over an ambient temperature range of -20°C to 30°C, with a maximum rate of change of 5°C per hour. Relative humidity will range from 20% to 80% non-condensing. Further, all Hardware to be supplied under the project shall be RoHS complaint (Restriction of Hazardous Substance) in Electrical & Electronics Equipment.

1.10. Acoustic Noise Level

The noise level of any equipment located in the server room shall not exceed 60 dbA measurements at three feet from the enclosure. The noise level of equipment located outside the server room shall not exceed 50 dbA three feet from the enclosure. Sound-deadening enclosures shall be provided where necessary to meet these requirements.

2. Technical Specification for Hardware

Below mentioned specification are on basis of general requirement. Bidder shall submit actual IT HW specification for prior approval to RECPDCL before supply and implementation at project site. The IT HW and applications shall suitable for AMI implementation as per requirements of IS 16444, CEA guidelines and bid document. It shall designed in accordance with 10 lakh consumers and shall be scalable up-to 20 lakh consumers as per future need of JKPDD.

2.1. Server

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of the Features</th>
<th>Minimum Quantity of the features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Processor</td>
<td>2*2.4 GHZ 8 core processor or more (should allow SMT and Processor partition capabilities) The offered systems should be high end Datacenter class servers with redundancy / N+1 features built in at every level like disk, power supplies, cooling etc.</td>
</tr>
<tr>
<td>2</td>
<td>Operating System</td>
<td>Latest version of OEM operating system shall be provided for each server, with required number of user license on each server</td>
</tr>
<tr>
<td>3</td>
<td>L3 cache</td>
<td>20MB minimum</td>
</tr>
<tr>
<td>4</td>
<td>Memory</td>
<td>Minimum 128 GB of ECC DDR4 Memory and scalable up to 8 times of present capacity.</td>
</tr>
<tr>
<td>5</td>
<td>Hard Drives Disk</td>
<td>Server should be configured with minimum 2 * 300GB 10K SAS 6Gbps 2.5in-HS HDD scalable up to 8 drives</td>
</tr>
<tr>
<td>6</td>
<td>Integrated RAID Controller</td>
<td>Integrated hardware RAID controller and should support hardware RAID 0, 1, 5. Offered controller should have minimum 1GB battery backed cache.</td>
</tr>
<tr>
<td>7</td>
<td>Gigabit Ethernet Ports</td>
<td>Servers should be configured with minimum 4*1Gigabit Ethernet ports</td>
</tr>
<tr>
<td>No</td>
<td>Description of the Features</td>
<td>Minimum Quantity of the features</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Storage Connectivity</td>
<td>Servers should be configured with two dual port 8Gbps Fibre Channel adapter to connect to external storage.</td>
</tr>
<tr>
<td>9</td>
<td>USB ports</td>
<td>Minimum 3 External/Internal USB Ports</td>
</tr>
<tr>
<td>10</td>
<td>Additional port</td>
<td>Server should have minimum 2 Number of 10G Fibre Ethernet Ports with SFP</td>
</tr>
<tr>
<td>11</td>
<td>Redundant Power Supply</td>
<td>Server should be configured with minimum Dual redundant power supplies.</td>
</tr>
<tr>
<td>12</td>
<td>Management Console</td>
<td>Should support integrated management with remote presence, Server should be supplied with OEM Server Management software/hardware and required ports</td>
</tr>
<tr>
<td>13</td>
<td>RAS feature</td>
<td>Should have RAS features such as Hot swappable disks, Hot pluggable/replaceable PCI Controllers, Power Supplies, Cooling fans etc.</td>
</tr>
<tr>
<td>14</td>
<td>Operating system</td>
<td>No Open source OS to be provided</td>
</tr>
</tbody>
</table>

### 2.2. Workstation Console

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description of the Features</th>
<th>Minimum Quantity of the features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spec</td>
<td>As per the base runtime requirement of CPU 2006 benchmarking standards</td>
</tr>
<tr>
<td>2</td>
<td>RAM</td>
<td>8GB</td>
</tr>
<tr>
<td>3</td>
<td>Internal Auxiliary memory</td>
<td>150GB delivered, expandable up to 300GB</td>
</tr>
<tr>
<td>4</td>
<td>Internal Optical Drive</td>
<td>DVD or Blu-ray (R+W)</td>
</tr>
<tr>
<td>5</td>
<td>Speakers</td>
<td>Two external speakers</td>
</tr>
<tr>
<td>6</td>
<td>Interfaces</td>
<td>1 Gb dual Ethernet ports USB Ports</td>
</tr>
<tr>
<td>7</td>
<td>Power Supply</td>
<td>AC Power Supply</td>
</tr>
<tr>
<td>8</td>
<td>User interface</td>
<td>Single 24” Screen (16:9 aspect ratio), HD Resolution (1920x1080) TFT Colour monitors, keyboard &amp; optical mouse</td>
</tr>
<tr>
<td>9</td>
<td>Mounting</td>
<td>Desktop mounting</td>
</tr>
</tbody>
</table>

### 2.3. Monitor for Server

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description of the Features</th>
<th>Minimum Quantity of the features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diagonal Viewable size</td>
<td>17-inch LCD rack console integrated with single-user, 8-port 1 U rack mount KVM switch with PS/2 and USB support and cables etc .</td>
</tr>
<tr>
<td>2</td>
<td>Colour support</td>
<td>16.7 million</td>
</tr>
<tr>
<td>3</td>
<td>On screen control</td>
<td>Required</td>
</tr>
<tr>
<td>4</td>
<td>Anti glare &amp; anti static</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Tilt , Swivel</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Aspect ratio</td>
<td>16:9</td>
</tr>
</tbody>
</table>

### 2.4. Firewall

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description of the Features</th>
<th>Minimum Quantity of the features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Architecture</td>
<td>Firewall shall be ASIC / non-ASIC based firewall and should have Multi core architecture to mitigate against the sophisticated threats</td>
</tr>
<tr>
<td>2</td>
<td>Certification</td>
<td>Firewall shall have ICSA certification for Firewall &amp; OS shall be</td>
</tr>
</tbody>
</table>
### Router

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of the Features</th>
<th>Minimum Quantity of the features</th>
</tr>
</thead>
</table>
| 1     | Performance Requirement    | A) Minimum packet forwarding rate of 280 Kbps for 64 byte packets.  
B) Must have at least 512 MB DRAM and Flash altogether.  
C) Router shall support on-line software reconfiguration to implement changes without rebooting |
| 2     | Standards                  | Must Confirm to Safety, EMI/EMC, FCC and COMMON CRITERIA certification compliance. |
| 3     | Interface ports            | a) The router must be modular  
b) It shall support minimum 6 port 10/100/1000 switching module & 2x10/100/1000 Base-T routable ports. |
| 4     | Power Supply               | Internal redundant power supplies |
| 5     | Routing Capabilities       | Router must support static routing, RIPv1/2, RIPng, OSPFv2 and v3, BGP4, Inter-VLAN routing, High availability: VRRP/HSRP |
| 6     | Security                   | Router must support basic firewall features along with below mentioned features  
- Generic Routing Encapsulation as per RFC 2784.  
- IPSec based point to point secure tunnels.  
- Access lists  
- MD5 Route Authentication as per RFC 1321 |
| 7     | Management                 | Router must support protocols like Telnet, SSHv2, SNMP v3, DHCP, RADIUS, TACACS+; USB / RJ-45 based console port and auxiliary port for management |

### SAN Switch

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Minimum description of the Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non-blocking architecture with minimum of 24 ports and scalable up to 48 ports in a single domain concurrently active at 16 Gbit/sec full duplex with no oversubscription.</td>
</tr>
</tbody>
</table>
The switch should support auto-sensing 2, 4, 8 Gbps capabilities.

The switch shall support different port types such as D Port, F Port, M Port (Mirror Port), EX Port and E Port; self-discovery based on switch type (U Port);

The switch should be rack mountable.

Non-disruptive Microcode/ firmware Upgrades and hot code activation.

The switch shall provide a minimum Aggregate bandwidth of 384 Gbit/sec: 24 ports × 16 Gbit/sec (data rate) end to end.

The switch should have additional power supply for redundancy

The Switch should be configured with the Zoning and ISL Licenses

The switch shall be able to support ISL trunk up to 128 Gbit/sec between a pair of switches for optimal bandwidth utilization and load balancing.

Support for web based management and should also support CLI.

The switch should support Dynamic Fabric Provisioning

The switch should support Access Gateway mode

The switch should support forward error correction feature

Port to port latency should be 700 ns

2.7. LAN Switch

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of the Features</th>
<th>Minimum Quantity of the features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conform to standards</td>
<td>Should be EAL 3+ or NDPP certified</td>
</tr>
<tr>
<td>2</td>
<td>Mounting</td>
<td>Rack mountable</td>
</tr>
<tr>
<td>3</td>
<td>Power Supply</td>
<td>*Internal redundant power supplies</td>
</tr>
<tr>
<td>4</td>
<td>Switching capability</td>
<td>Layer-3 switching &amp; VLAN</td>
</tr>
<tr>
<td>5</td>
<td>Interface ports</td>
<td>** Minimum 24<em>1 GBps Ethernet ports &amp; Minimum 4</em>10G SFP+ ports from day 1</td>
</tr>
<tr>
<td>6</td>
<td>Routing Capabilities</td>
<td>Static Routing and VRRP from day 1</td>
</tr>
<tr>
<td>7</td>
<td>High Availability</td>
<td>Should support Hot Standby Router Protocol (HSRP) or equivalent protocol to create redundant topologies.</td>
</tr>
<tr>
<td>8</td>
<td>Layer 3 Capabilities</td>
<td>Should be having L3 features like OSPF &amp; BGP from day 1.</td>
</tr>
<tr>
<td>9</td>
<td>Cable standard</td>
<td>For Ethernet : Cat 6 or higher bandwidth cable For Optical : LC cable for server</td>
</tr>
</tbody>
</table>

2.8. Storage

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Features</th>
<th>Detailed features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Storage Architecture</td>
<td>SAN Storage System with no single point of failure architecture. Storage subsystem should also be able to support Unified (SAN &amp; NAS) as an integrated offering. Management of storage system should be through single management tool.</td>
</tr>
<tr>
<td>2</td>
<td>Storage Controller</td>
<td>System to have minimum Two controllers</td>
</tr>
<tr>
<td>3</td>
<td>Storage Cache / System Memory</td>
<td>The system should have a minimum of 16GB of system memory mirrored across dual SAN controllers. The SAN storage system must keep write cache persistent during fault conditions. Array should support cache de-stage to disk or battery backed cache in order to avoid any data loss due to abrupt power outage.</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>Front-end Ports</strong></td>
<td>Proposed should have minimum 4 FC Host ports at 8 Gbps per controller and should support additional iSCSI ports in each controller. The storage arrays shall minimum support 8Gbps FC, 1Gbps iSCSI. Both FC and iSCSI ports shall have the capability of host connectivity.</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td><strong>Back-end Disk Ports</strong></td>
<td>Storage System should have minimum 4 X 12Gbps SAS backend lanes per controller</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td><strong>Storage Capacity &amp; Performance Configured</strong></td>
<td>System should be configured to deliver capacity as per sizing of the solution provider. System should be sized to deliver the performance required on RAID 5. Supplier to include the required number of drives &amp; share the sizing calculation explaining how the designed solution is meeting the required IOPS.</td>
</tr>
<tr>
<td><strong>7</strong></td>
<td><strong>Storage Scalability</strong></td>
<td>System should be scalable to minimum 120 Disk Drives by adding disk shelves without the need of controller addition or upgrade.</td>
</tr>
<tr>
<td><strong>8</strong></td>
<td><strong>Disk Support</strong></td>
<td>Storage space must be provided by using disk size of 600GB/900GB/1.2TB to achieve minimum Front End IOPS 20,000 at block size of 32 KB with response time of less than 3 ms. Bidder can use SSD drives to achieve mentioned performance level.</td>
</tr>
<tr>
<td><strong>9</strong></td>
<td><strong>Protocols Support</strong></td>
<td>System should be configured with minimum 4 x 8 Gbps FC ports. All the licenses should be provided.</td>
</tr>
<tr>
<td><strong>10</strong></td>
<td><strong>RAID Support</strong></td>
<td>Should support RAID 0, 1, 10, 5, 6</td>
</tr>
<tr>
<td><strong>11</strong></td>
<td><strong>Storage Array Management</strong></td>
<td>Easy to use GUI based and web enabled administration interface for configuration, storage management. Storage Management software must include both GUI and CLI tools. It must be able to centrally manage and monitor multiple arrays of same class from the vendor over the network. It must support event auditing for security. Should be able to support automated email to vendor support center for proactive maintenance. Should be able to report metrics including Inventory of all components, reports on Capacity (raw, user, compressed, oversubscribed), reports on Performance (throughput, bandwidth, queue length, service time, response time), Health(Availability, SLA).</td>
</tr>
<tr>
<td><strong>12</strong></td>
<td><strong>On-line Expansion / RAID Group creation / Pool Expansion</strong></td>
<td>System support online expansion of RAID Group or addition of new RAID Group. Must be able to add additional disks on the fly to expand the RAID group capacity or create new RAID Group.</td>
</tr>
<tr>
<td><strong>13</strong></td>
<td><strong>Global Hot Sparing</strong></td>
<td>System should have the capability to designate global hot spares at least 1 drive per 20 drives that can automatically be used to replace a failed drive anywhere in the system.</td>
</tr>
</tbody>
</table>
LT Service Cable XLPE Insulated

1.0 SCOPE:

1.1 The scope of this specification covers the design, manufacture inspection and testing the finished ISI marked LT (1100 volts, 31/2 x25 Sq.mm to 400 Sq.mm stranded, compact aluminum conductor, with XLPE insulated, PVC inner sheathed, galvanized steel strip armored/unarmoured and overall PVC sheathed Black colour cable conforming to IS:7098 /88 with latest amendments and as per specification detailed.

2.0 RATED VOLTAGE:

2.1 The rated voltage of the cable shall be 1100 Volts AC with the highest system voltage of 1100 Volts between phases of the effectively earthed three-phase transmission system.

2.2 The cables shall be capable of operating continuously under the system frequency variation of ± 3 Hz, voltage variation of ± 10% and a combined frequency – voltage variation of ± 10%.

3.0 APPLICABLE STANDARDS:

i) Unless otherwise stipulated in the specifications, the latest version of the following Standards shall be applicable:

   o IS 7098 (Part 2)-Cross-linked Polyethylene insulation for Cables.
   o IS 8130-Conductors for insulated electrical cables and flexible cords.
   o IS 10810(series)-Methods of tests for cables.
   o IS 10418-Drums for electric cables.
   o IS 3975-Specification for mild steel wires, strips and tapes for armouring of cables.
   o IS 5831-Specification for PVC insulation sheath for electric cables.
   o IS 10462-Fictitious calculation method for determination of dimensions of protective coverings of cables Part 1 - Elastomeric and thermoplastic insulated cables.

ii) The cables manufactured to any other International Standards like BSS, IEC or equivalent standards not less stringent than Indian Standards are also acceptable. In such cases the Manufacturer shall enclose a copy of the equivalent international standard, in English language.

4.0 CONSTRUCTION:

4.1 Conductor: - The cable conductor shall be made from stranded aluminum to form compact sector shaped conductor having resistance within the limits specified in IS:8130/1984 and any amendment thereof. The wires shall be laid up together with a suitable right hand lay. Stranded Class 2 – as per the IS:8 130 / IEC 60228/ BS 6360 standards.

4.2 Insulation: - The insulation shall be cross linked polyethylene applied by extrusion and shall be steam (wet) cured as per IS:7098(1)1988 and curing in hot water tank/bath is not accepted.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Properties</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tensile Strength</td>
<td>12.5N/mm², Min.</td>
</tr>
</tbody>
</table>
2. Elongation to break

3. Aging in air oven:
   a) Treatment: Temperature: 135±3°C
      Duration: 7 days
   b) Tensile Strength variation: ±25 percent, Max
   c) Elongation variation: ±25 percent, Max

4. Hot set:
   a) Treatment: Temperature: 200±3°C
      Time under load: 15 min
      Mechanical stress: 20N/cm²
   b) Elongation under load: 175 percent, Max
   c) Permanent elongation (set) after cooling: 15 percent, Max

5. Shrinkage:
   a) Treatment: Temperature: 130±3°C
      Duration: 1 hour
   b) Shrinkage: 4 percent, Max

6. Water absorption (Gravimetric):
   a) Treatment: Temperature: 85±2°C
      Duration: 14 days
   b) Water absorbed: 1 mg/cm², Max

7. Volume Resistivity
   a) at 27°C: \(1 \times 10^{14}\) ohm-cm, Min
   b) at 70°C: \(1 \times 10^{13}\) ohm-cm, Min

8. Thermal Resistivity: 350 degrees C cm/W

9. Power factor at maximum conductor temperature: 0.008

10. Dielectric strength: 22 kV/mm

**4.3.1** The XLPE insulation should be suitable for specified 1.1 KV system voltage.

**4.3.2** The manufacturing process shall ensure that insulations shall be free from voids.

**4.3.3** The insulation shall withstand mechanical and thermal stresses under steady state and transient operating conditions.

**4.3.4** The insulation of the cable shall be high stranded quality, specified in IS:7098 (Part-II/1985). Withstand continuous conductor temperature of 90 deg C, which means higher continuous rated current carrying capacity.

**4.3.5** The cables can operate even at conductor temperature of 130 deg C continuously and 250 deg C during a Short Circuit condition

**4.4 SHEATH:**

The sheath shall be suitable to withstand the site conditions and the desired temperature. It should be of adequate thickness, consistent quality and free from all defects. The PVC sheath shall be extruded as per IS:7098 (Part – I/1988). IEC:60502 Part– I,BS:6622, LSOH to BS:7835.

**4.5 ARMOUR:**

Armoring shall be applied over the inner sheath with single galvanized steel complying with the requirements
of IS:3975/1979. The dimensions of the galvanized strip shall be as specified in table 4 of the IS:7098/Part-I/1988. The armour wire shall be applied as closely as practicable. The direction of the lay of the armour shall be left hand. The joints in armour wire shall be made by brazing or welding and the surface irregularities shall be removed. A joint in any wire shall be atleast 300mm from the nearest joint in any other armour wire in the complete cable and shall be as per IS:7098 Part 1, IS: 3975.

The cable without armouring shall also be accepted of type detailed in price schedule.

4.6 **OUTER SHEATH**: Extruded PVC ST2, outer sheath as per IS:5831/1984, IS:7098

Part 1, IEC:60502 Part – 1, BS:6622, LSOH to BS:78 35. shall be applied over armorring with suitable additives to prevent attack by rodents and termites. Outer sheathing shall be designed to offer high degree of mechanical protection and shall also be heat, oils, chemicals, abrasion and weather resistant. Common acids, alkalis, saline solutions etc., shall not have adverse effects on the PVC sheathing material used.

4.7 The cables should be suitable for use in solidly earthed system.

4.8 The power cables shall be manufactured to the highest quality, best workmanship with scientific material management and quality control. The Manufacturer shall furnish the quality plan, giving in detail the quality control procedure / management system.

4.9 The cable shall be suitable for laying in covered trenches and/or buried underground to meet the outdoor application purposes.

5.0 **SYSTEM DETAILS**:

<table>
<thead>
<tr>
<th>General Technical particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal system voltage (rms) (U)</td>
</tr>
<tr>
<td>Highest system voltage (rms) (U&lt;sub&gt;m&lt;/sub&gt;)</td>
</tr>
<tr>
<td>Number of Phase</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Variation in Frequency</td>
</tr>
<tr>
<td>Type of Earthing</td>
</tr>
<tr>
<td>Total relay &amp; circuit breaker Operating time</td>
</tr>
</tbody>
</table>

6.0 **CLIMATIC CONDITIONS**: 

Page 424 of 444
(a) Maximum ambient air temperature (in shade) 45°C
(b) Maximum ambient air temperature (under sun) 50°C
(c) Maximum daily average ambient air temperature 35°C
(d) Maximum yearly average ambient air temperature 30°C
(e) Maximum humidity 100%
(f) Altitude above M.S.L. Up to 1000M
(g) Average No. of thunder storm days per annum 50
(h) Average No. of dust storm days per annum Occasional
(i) Average No. of rainy days / annum 90
(j) Average Annual Rain fall 925mm
(k) Normal tropical monsoon period 4 months
(l) Maximum wind pressure 150 kg/Sq.M

7.0 MATERIALS:

Conductor: The conductor shall be of stranded construction. The material for conductor shall consist of the plain aluminum of H2 or H4 grade as per clause – 3 of IS 8130/1984.

The minimum number of wires shall be 53 for circular compacted 400 sq. mm aluminum conductor as per table – 2 of IS 8130/1984.

8.0 INSPECTION AND QUALITY CONTROL:

The Manufacturer shall furnish a complete and detailed quality plan for the manufacturing process of the cable. All raw materials shall conform to relevant applicable standards and tested for compliance to quality and requirement. During the manufacturing process, at all stages, inspections shall be made to check the physical and dimensional parameters, for verification to compliance to the standards. The Manufacturer shall arrange, for inspection by the purchaser, during manufacture with one month advance notice for verifying the various stage inspections as specified in the quality assurance plan enclosed to verify the quality control process of the Manufacturer.
9.0 **TYPE TESTS:**

Type test certificates from Accredited NABL Testing Laboratories for 1.1 kV XLPE, shall be submitted along with Purchase order. The Type Tests should have been conducted not later than 5 years as on the date of supply.

1. Stage wise Inspection: The Manufacturer shall offer the stage wise inspection as detailed in the in the quality assurance plan
2. All acceptance tests shall be conducted in the presence of the Employer’s representative.
3. The supplier shall give 10 days advance notice for inspections, and witnessing of tests by the Employer representative.
4. The following type tests shall be conducted on the cable.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Test</th>
<th>Requirement</th>
<th>Test method Ref Part no of IS: 10810</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Tests on conductor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i)</td>
<td>Tensile test</td>
<td>IS:8130</td>
<td>2</td>
</tr>
<tr>
<td>ii)</td>
<td>Wrapping test</td>
<td>IS:8130</td>
<td>3</td>
</tr>
<tr>
<td>iii)</td>
<td>Resistance test</td>
<td>IS:8130</td>
<td>4</td>
</tr>
<tr>
<td>b)</td>
<td>Tests for armoured wires and strips</td>
<td>Clause 15.2 &amp; IS:3975</td>
<td>36 to 42</td>
</tr>
<tr>
<td>c)</td>
<td>Test for thickness of insulation and sheath</td>
<td>Clause 4.3, 14.2 &amp; 16.2</td>
<td>6</td>
</tr>
<tr>
<td>d)</td>
<td>Physical tests for insulation:</td>
<td>Clause 4.2</td>
<td></td>
</tr>
<tr>
<td>i)</td>
<td>Tensile strength and elongation at break</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>ii)</td>
<td>Aging in air oven</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>Hot test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>Shrinkage test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v)</td>
<td>Water absorption (gravimetric)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e)</td>
<td>Physical tests for outer sheath</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IS: 5831</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i)</td>
<td>Tensile strength and elongation at break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>Aging in air oven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>Shrinkage test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>Hot deformation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f)</td>
<td>High voltage test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g)</td>
<td>Flammability test</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 10.0 ACCEPTANCE TEST:

The sampling plan for acceptance test shall be as per IS 7098 part -II, Appendix ‘A’.

The following shall constitute the acceptance test.

a. Tensile test for aluminum.

b. Wrapping test for aluminum.

c. Conductor resistance test.

d. Test for thickness of insulation.
(i) Test for thickness of inner and outer sheath.

(ii) Hot-set test for insulation.

(iii) Tensile strength and elongation at break test for insulation and outer sheath.

(iv) High voltage test.

(v) Insulation resistance (volume resistivity) test.

11.0 **ROUTINE TEST:**

The following shall constitute routine tests:

- Conductor resistance test.
- High voltage test.

12.0 **PACKING:**

The cables, as per specified delivery lengths, shall be securely wound /packed in non-returnable wooden drums, capable of withstanding rough handling during transport by Rail, Road, etc. The packing should withstand storage conditions in open yards. The cable drums shall conform to IS 10418-1982 or equivalent standard. The dimensional drawings of wooden drums shall be furnished with the Purchase order. The drum shall be provided with circumferential lagging of strong wooden planks. The end of the cable shall be sealed with good quality heat shrink sealing caps. The sufficiently required additional sealing caps shall be supplied for use of testing during laying and jointing at site and to seal spare lengths of cable. The packing should be able to withstand the rigorous of transport. The following information in bold letters in English shall be painted on the flanges.

a. Name & Address of the manufacturer, Trade name/Trade mark/Brand

b. ISI Marking

c. Size of cable (Cross section) rated voltage, standard, insulation, cable code, drum No., and year of manufacture.

d. Length of cables (Meters)

e. Direction of rolling

i) Net weight (in Kg)

ii) Gross weight (in Kg)

iii) Owners purchase order reference.
TECHNICAL SPECIFICATION FOR FOUR CORE AND TWO CORE XLPE CABLES of Various SIZES 16mm², 10mm² INSULATED & XLPE SHEATHED UN-ARMORED LT CABLES
TECHNICAL SPECIFICATION FOR FOUR CORE AND TWO CORE XLPE INSULATED & XLPE SHEATHED UN-ARMORED CABLES.

1. SCOPE

This section provides for manufacture, testing before dispatch, supply and delivery F.O.R. destination of Four Core & Twin Core size 16mm², 10mm² XLPE insulated and XLPE Sheathed Un-armored circular LT cables with aluminum conductor suitable for working voltage up to & including 1100 Volts ISI Marked & Conforming to IS 7098 (Pt-I)/1988 with latest amendments.

2. STANDARDS

Unless otherwise stipulated in this specification the following standards with latest amendments shall be applicable.

2.1 IS: 7098(Pt-I)/1988 XLPE Insulated (Heavy Duty) Electric cable for Voltages up to and including 1100 Volts working

2.2 IS: 8130/1984 Conductors for insulated cables.

2.3 IS: 5831/1984 XLPE insulation and sheath of electric cables.

2.4 IS: 10810/1984 Method of test for cables.

2.5 IS: 3975/1979 Galvanized Steel Wire/Strips.

2.6 IS: 10418/1982 Drums for electric cables.

3. CLIMATIC CONDITIONS:

<table>
<thead>
<tr>
<th>The service conditions shall be as follows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum altitude above sea level</td>
</tr>
<tr>
<td>Maximum ambient air temperature</td>
</tr>
<tr>
<td>Maximum daily average ambient air temperature</td>
</tr>
<tr>
<td>Minimum ambient air temperature</td>
</tr>
<tr>
<td>Maximum temperature attainable by an object exposed to the sun</td>
</tr>
<tr>
<td>Maximum yearly weighted average ambient temperature</td>
</tr>
<tr>
<td>Maximum relative humidity</td>
</tr>
<tr>
<td>Average number of thunderstorm days per annum (isokeraunic level)</td>
</tr>
<tr>
<td>Average number of rainy days per annum</td>
</tr>
<tr>
<td>Average annual rainfall</td>
</tr>
<tr>
<td>Maximum wind pressure</td>
</tr>
</tbody>
</table>

Note: The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog and snow in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3 g.
4. GENERAL REQUIREMENT:

4.1 The ISI marked XLPE Insulated Un-un-armored cables shall conform to IS: 7098(Pt-I) /1988 with latest amendment and bear BIS certification mark. The material used for construction of the cables shall be of best quality complying with the requirement of IS: 7098(Pt-I)/1988 and other relevant standards. The cables shall be suitable for outdoor/indoor installation free in air and shall be capable of withstanding the normal stresses associated with transportation, erection, reeling and unreeling operations without getting deformed.

4.2 The cable shall be suitable for use where combination of ambient temperature and temperature rise due to load results in a conductor temperature not exceeding 90 degree C under normal operation and 250 degree C under short circuit condition.

4.3 The XLPE Insulated Un-Un-armored LT Cable shall be ISI marked. The tenderer (MANUFACTURER) must furnish valid ISI certificate along with offer.

5. MATERIAL:

5.1 CONDUCTOR
The conductor shall be composed of aluminum wire complying with IS: 8130/1984 with latest amendments.

5.2 INSULATION
Insulation shall be cross linked Polyethylene (XLPE) conforming to the requirements Table-I of IS: 7098/1984 with latest amendments.

5.3 FILLERS
5.3.1 The central hole/void, if any, of the cable shall be invariably filled with suitable filler material so that there is no gap in the center.

5.3.2 The filler shall be of vulcanized rubber, un-vulcanized rubber or Thermoplastic material and shall be provided to fill the gaps between cores.

5.3.3 The filler material shall be so chosen so as to be compatible with temperature of the cable and shall have no deleterious effect on other components of the cable. These shall not be harder than XLPE and PVC used for insulation and outer sheath respectively.

5.4. OUTER SHEATH
The outer sheath shall consist of type ST-2 XLPE Compound conforming to the requirements of IS: 5831/1984.

6. CONSTRUCTION:

6.1 CONDUCTOR
The construction of the conductor shall be stranded for cable size 10 Sq. mm and above, as per Clause No. 8.1 of IS:7098(Pt-I)/1988 & relevant clause of IS:8130/1984.

A protective barrier may be applied between the conductor and insulation. Such barriers when used shall be compatible with insulating material and suitable for the operating temperature of the cable.

6.2 INSULATION:
The conductor (with protective barrier, wherever applied) shall be provided with Cross-Linked Polyethylene (XLPE) insulation applied by extrusion. The
insulation shall be so applied that it fits closely on the conductor and it shall be possible to remove it without damage to the conductor. The thickness and tolerance on thickness of insulation shall be as per clause No. 9.2 of IS: 7098 (Pt-I)/1988.

6.3 CORE IDENTIFICATION:

The core shall be identified by different coloring of XLPE insulation as per Clause No. 10.1 of IS: 7098 (Pt-I)/1988.

6.4 LAYING UP OF CORES:

The cores shall be laid up together with the suitable right hand lay. The interstices shall be filled with non-hygroscopic material.

6.5 INNER SHEATH (COMMON COVERING):

6.5.1 The laid up cores shall be provided with an inner sheath applied either by extrusion or by wrapping. It shall be ensured that it is as circular as possible. The thickness of inner sheath shall be as given in Table-5 of IS: 7098(Pt-I)/1988.

6.5.2 The inner sheath shall be so applied that it fits closely on the laid up cores and it shall be possible to remove it without damage to the insulation.
6.6 OUTER SHEATH

6.7.1. The outer sheath shall be applied over the armouring.

6.7.2. The color of the outer sheath shall be black.

6.7.3. The minimum thickness of XLPE outer sheath shall not fall below the thickness specified in Table -8 of IS: 7098 (Pt-I) /1988.

7. TESTS AND TEST CERTIFICATES:

7.1 The cable should meet the requirement of all tests including optional tests as specified at Clause No. 15.4 of IS: 7098 (Pt. I) /1988.

7.1.1 The following shall constitute routine tests:

7.1.1.1 Conductor resistance test.

7.1.1.2 High Voltage test.

7.1.2 The following shall constitute Acceptance Tests:

7.1.2.1 Tensile test (for Aluminum).

7.1.2.2 Wrapping test (for Aluminum).

7.1.2.3 Conductor resistance test.

7.1.2.4 Test for thickness of Insulation & Sheath.

7.1.2.5 Tensile strength & elongation at break of Insulation & sheath.

7.1.2.6 Insulation resistance (Volume Resistivity) test.

7.1.2.7 High Voltage test.

7.1.2.8 Hot Set Test for Insulation.
7.1.2.9 Cold Bend Test for outer sheath.
7.1.2.10 Cold Impact Test for outer sheath.

**7.1.3 The following shall constitute Type Tests:**

**7.1.3.1 Tests of Conductor**
- 7.1.3.1.1 Tensile test (for aluminum)
- 7.1.3.1.2 Wrapping test (for aluminum)
- 7.1.3.1.3 Conductor resistance test.
- 7.1.3.2 Test for Armoring Wires/ Strips
- 7.1.3.3 Test for thickness of insulation and sheath

**7.1.4 Physical tests for insulation:**
- 7.1.4.1 Tensile strength and elongation at break.
- 7.1.4.2 Ageing in air oven.
- 7.1.4.3 Hot Set test.
- 7.1.4.4 Shrinkage Test.
- 7.1.4.5 Water Absorption (Gravimetric).

**7.1.5 Physical tests for Outer Sheath:**
- 7.1.5.1 Tensile strength and elongation at break.
- 7.1.5.2 Ageing in air oven.
- 7.1.5.3 Loss of mass in air oven.
- 7.1.5.4 Shrinkage Test.
- 7.1.5.5 Hot Deformation Test.
- 7.1.5.6 Heat shock Test.
- 7.1.5.7 Thermal Stability.

**7.1.6 Insulation resistance (Volume Resistivity Test)**

**7.1.7 High voltage test.**

**7.1.8 Flammability test.**

**7.2** The tenderer shall furnish latest complete type tests and optional test certificates as specified in Clause No. 15.4 of IS: 7098(Pt-I)/1988 (not older than three years as on the date of tender opening) for all sizes of offered LT XLPE UN-UN-ARMORED CABLES from NABL accredited testing laboratory with the tender offer otherwise their offer is likely to be ignored.

**7.3** The tenderer must also clearly indicate various testing facilities available at their works for testing the material as per relevant standards. In case of otherwise, particulars of the place where such testing is proposed to be conducted during the course of inspection, shall be indicated with the offer.
8 INSPECTION:

8.1 The inspection may be carried out by the purchaser at any stage of manufacture. The successful tenderer shall grant free access to the purchaser’s representatives at a reasonable time when the work is in progress. Inspection and acceptance of any equipment / material under this specification by the purchaser shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment/material is found to be defective.

8.2 The supplier shall keep the purchaser informed in advance about the manufacturing program so that arrangement can be made for inspection.

8.3 The acceptance tests as per IS: 7098(Pt-I)/1988 shall also be conducted by the manufacturer before dispatch in the presence of purchaser’s Representative / Inspecting Officer as per relevant clause of “General Conditions of Contract” along with verification of lengths & weight and checking the manufacturing defects, if any of samples coils. The mass of aluminum, XLPE, PVC & Filler in sample coils shall also be verified by the Inspecting Officer(s).

Cold bend/ cold impact test (IS: 5831/1984) shall constitute the optional tests and shall be conducted on each offered lot of the cables of each size as per Clause No. 15.4 of IS: 7098(Pt-I)/1988.

8.4 TYPE TESTS:

The first lot offered shall not be less than 10% of ordered quantity of each size of LT XLPE UN-UN-ARMORED CABLE.

One sample from the 1st Lot of LT XLPE UN-UN-ARMORED Cable of each size as received in purchaser’s store shall be selected and sealed by the inspecting officer nominated by purchaser’s for getting it type tested at any NABL accredited testing laboratory. The charges incurred towards type test of the material received in our stores shall be borne by Supplier.

In case sample from first lot fails then:

8.4.1 Supplier shall have to replace the full quantity of the respective inspected lot supplied to various stores and lying unused at stores.

8.4.2 For the quantity already utilized against the order in field a deduction @ 15% (Fifteen Percent) of F.O.R. Destination prices of the material supplied shall be made.
8.4.3 Sample from next lot shall be selected again for type test. All test charges incurred towards type test of the material for second time shall be borne by the Supplier. In case sample again fails in the type test then further supplies shall not be accepted.

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

8.6 At least 5% of total numbers of drums subject to minimum of 2 in each lot put up for inspection shall be selected at random to ascertain the length/workmanship of cable by the following method:

At the work of the manufacture, the cable shall be transferred from one drum to another for checking any manufacturing defects in the cable drum selected for conducting acceptance tests, at the same time measuring its length with the help of pulley & cyclometer graduated in presence of inspector. The difference in the measured 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).

8.7 The supplier shall present the latest Calibration Certificate(s) of testing instruments/equipments to be used for the testing of the material covered in the Purchase Order to the authorized inspecting officer /inspecting agency of the purchaser. The testing instruments / meters /apparatus etc. should be got calibrated by the supplier from time to time from an independent testing laboratory / house having valid accreditation from National Accreditation Board for testing and calibrating laboratories for the testing equipment or from original manufacturers having trace ability to NABL /NPL. The calibration certificate(s) should not in any case be older than one year at the time of presenting the same to the inspecting officer / inspecting agency of the purchaser. The testing instruments / equipment should be duly sealed by the Calibrating Agency and mention thereof shall be indicated in the calibration certificate(s).

8.8 TEST CHECKING OF MATERIAL AT STORES:

8.8.1 SAMPLING:

8.8.1.1 One number out of each lot / sub-lot of 25 Nos. drums or pert thereof for cables of size 10 Sq. mm. and above.

8.8.2 TESTS:

The following tests shall be carried out:

8.8.2.1 Measurement of Resistance of conductor.
8.8.2.2 Tensile & Elongation test for insulation.
8.8.2.3 Thickness of Insulation.

8.8.3 CRITERIA FOR ACCEPTANCE:

8.8.3.1 If the measured conductor resistance of the sample(s) exceeds beyond 2% as per the resistance specified in the contract, the material shall be rejected and the same shall have to be replaced by the supplier.

8.8.3.2 If the measured conductor resistance of the sample(s) exceeds the value specified in the contract but does not exceed by more than 2%
of the resistance value specified in the contract, the material pertaining
to the relevant lot/ sub-lot to shall be accepted with a deduction @ 1.5%
of the cost of cable for increase in resistance for every 1% or part thereof.

If the sample(s) fails in any other test, the material contained in the
pertinent lot/sub-lot shall be rejected and shall have to be replaced by the
supplier.

8.9 TEST CHARGES:

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

8.10 The manufacturer shall be responsible to pay penalty of Rs 20,000/- for
each occasion at which the fake inspection call has been made or the
material is rejected during testing/inspection by the authorized
agency/representative of the Purchaser. This penalty would be in addition
to the expenses incurred by the Purchaser in deputing the Inspecting Officer,
carrying out such inspection.

9. IDENTIFICATION:

9.1 The manufacture shall be identified throughout the length of cables as per
Clause No. 17.1 of IS: 7098(Pt-1)/1988.

9.2 In order to distinguish these electric cables from telephone cables, the word
ELECTRIC shall be indicated, printed or embossed throughout the length of
the cable on outer sheath.

9.3 The cable code shall be provided as per Clause No. 17.3 of IS: 7098 (Pt-

9.4 The cable shall also be required to be embossed with the word Name of
Manufacture or trade name, Cable code, Voltage Grade, JKPDD, size of
cable, year of manufacture and ISI certification mark at every meter length
for which no extra charges shall be paid.

10 PACKING AND MARKING:

10.1 The cables shall be wound on non-returnable wooden drums conforming
to IS: 10418/1982 of suitable size and packed. The ends of the cable shall
be sealed by means of non-hygroscopic sealing material. Only one cable
length shall be supplied on a drum.

10.2 The cable shall carry the following information stenciled /painted on the
drum:

10.2.1 Manufacturer’s name, Brand name or trade mark.
10.2.2 Type of cable and voltage grade.
10.2.3 Number of Cores.
10.2.4 Nominal Cross-sectional area of the conductor.
10.2.5 Cable Code.
10.2.6 Length of cable on the drum.
10.2.7 Approximate gross weight.
10.2.8 Year of manufacture.
10.2.9 BIS Certification marks.
10.2.10 Name of the Consignee and full destination.
10.2.11 Tender number/Purchase Order No.
10.2.12 The word SUITABLE FOR OUTDOOR USE & LOW TEMPERATURE CONDITIONS.

11. STANDARD LENGTH:

11.1 The cables shall be supplied in the standard length of 500 Meter for,

4CX16 Sq. mm², and 1000 Meter for size 4CX10Sq. mm², 2CX16Sq. mm² 2CX10 Sq. mm².

11.2 A tolerance (+/-) 5 % shall be allowed in standard length.

11.3 Only one cable length shall be acceptable by non-standard length measuring not less than 50% of standard length to complete the ordered quantity in each size.

12 QUANTITY:

The quantities as mentioned in the Schedule of requirement are tentative & these may increase/decrease as per the requirement of the Purchaser.

13 QUANTITY TOLERANCE:

The quantity tolerance of (+/-)2% shall be allowed in each size for completion of supply.

14. GUARANTEED TECHNICAL PARTICULARS:

The tenderer shall furnish guaranteed technical particulars in the relevant schedule.( Annexure– I & II)

15. CONSTRUCTIONAL DRAWINGS:

The tenderer is required to furnish the detailed constructional drawing of the cable clearly showing shape of core, type and size of fillers/ interstices along with center filler etc. In absence of this the tender is likely to be ignored.

16. Challenge Clause:-

The material offered/received after the inspection by the authorized inspecting officer may again be subjected to the test for or any parameter from any testing house/in-house technique of the Purchaser & the results if found deviating un-acceptable or not complying to approved GTPs the bidder shall arrange to supply the replacement within thirty (30) days of such detection at his cost including to & fro transportation. In addition, penalty @10% of cost of the inspected lot of material shall be imposed.

17. Warranty Period:-

The supplier shall be responsible to replace, free of cost, with no transportation or insurance cost to the purchaser, up to destination, the whole or any part to the material which in normal and proper use proves the defective in quality or workmanship, subject to the condition that the defect is noticed within 18 months from the date of receipt of material in stores or 12 months from the date of commissioning whichever period may expire earlier. The consignee or nay other officer of Purchaser actually using the material will give prompt notice of each such defect to the supplier. The replacement shall be effected by the supplier within a reasonable time, but not, in any case, exceeding 45 days/ The supplier shall, also, arrange to remove the defective within a reasonable period, but not exceeding 45 days from the date of issue of notice in respect thereof, failing which, the purchaser reserve the right to dispose of defective material in any manner...
considered fit by him (purchaser), at the sole risk and cost of the supplier. Any sale proceeds of the defective material after meeting the expenses incurred on its custody, disposal handling etc., shall however be credited to the supplier’s account and set off against any outstanding dues of the purchaser against the supplier. The warranty for 12/18 months shall be one time.
<table>
<thead>
<tr>
<th>S. No</th>
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<th>4 CORE XLPE UN-ARMOURNED CABLES</th>
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<td>4CX16</td>
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<td>Standard specification to which the material shall apply.</td>
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<td>3</td>
<td>VOLTAGE GRADE.</td>
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<td>4</td>
<td>NO. OF CORES.</td>
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5 **CONDUCTOR DETAILS:**

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<tbody>
<tr>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Neutral Conductor (Sq.mm)</td>
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<th>C</th>
<th>SHAPE OF CONDUCTOR</th>
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<td>Whether compacted or non-compacted</td>
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<th>E</th>
<th>Resistance at 27 oC</th>
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<tbody>
<tr>
<td>1</td>
<td>Phase Conductor ohm/km</td>
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<tr>
<td>2</td>
<td>Neutral Conductor ohm/km</td>
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6 **INSULATION**

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<tr>
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<td></td>
<td>Nominal (mm)</td>
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<tr>
<td></td>
<td>Minimum (mm)</td>
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7 **Type of inner sheathing and Colour**

8 Whether Binder Tape provided

9 **Armoring**

<table>
<thead>
<tr>
<th>A</th>
<th>Type</th>
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<tbody>
<tr>
<td>B</td>
<td>Dimension (mm)</td>
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10 **Outer Sheath**

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<td>B</td>
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<td>Nominal (mm)</td>
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<tr>
<td></td>
<td>Minimum (mm)</td>
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11 | Standard to which it Confirm |

12 **MAX. OVERALL DIAMETER OF THE CABLE IN MM.**

13 **Nature of Packing.**

14 **DRUM**

<table>
<thead>
<tr>
<th>A</th>
<th>TARE WEIGHT OF DRUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>WHETHER DRUM IS WHELL</td>
</tr>
<tr>
<td>C</td>
<td>STANDARD SPECIFICATION TO WHICH</td>
</tr>
<tr>
<td>D</td>
<td>DRUM DETAILS &amp; DIMENSIONS</td>
</tr>
</tbody>
</table>

<p>| E | Whether 2-Full Ply Flange Construction or 2-Full Ply plus 1 Segmental layer Flange Construction. |</p>
<table>
<thead>
<tr>
<th></th>
<th>Drum size</th>
</tr>
</thead>
</table>

| A | Flange Diameter (d1) (mm) |
| B | Barrel Diameter (d2) (mm) |
| C | Centre hole Diameter (d3) (mm) |
| D | Overall with (L1) (mm) |
| F | Travers (L2) (mm) |

| G | Thickness of Flange |
| H | Barrel End (Supporting disc or |
| 1 | Diameter (mm) |
| 2 | Thickness (mm) |
| I | Stretcher (core carrier Planks) |
| 1 | Number (Min) |
| 2 | Thickness x width (mm) |
| J | Barrel Battens thickness (core |
| K | Barrel Middle Supports (Middle |
| L | Thickness of External Lagging. |

## 2 DETAILS OF METAL

| A | Clamping Studs with |
| 1 | Numbers |
| 2 | Diameter (mm) |
| B | Square or Round Washers |
| 1 | Numbers |
| 2 | Diameter (mm) |
| C | M.S. Bushes |
| 1 | Numbers |
| 2 | Thickness of Sleeve (mm) |
| 3 | Dimension of Sleeve (mm) |
| 4 | Number of Bolts |
| 5 | Diameters of Bolts |
| D | M.S. /C.I. Centre Plate |
| 1 | Numbers |
| 2 | Diameter of Bolts (mm) |
| 3 | Centre Plate Bolts. |
| E | Centre Hole Diameter (mm) |
| F | Minimum Weight in kg/km |
| 1 | Aluminum |
| 2 | XLPE |
| 3 | PVC |
| G | Standard Length of cable in metre & its Tolerance |
| H | Whether material bears BIS Certification |
| I | BIS License no. & validity. |
| J | Embossing. |
| K | Any other particulars. |
## ANNEXURE-III

GURANTEED TECHNICAL AND OTHER PARTICULARS FOR THE SUPPLY OF 2 CORE LT XLPE UN-ARMOURED CABLES.

<table>
<thead>
<tr>
<th>S. No</th>
<th>PARTICULARS</th>
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<tr>
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<td>IS/REC specified Values</td>
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<td>Standard specification to which the material shall confirm.</td>
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<td>VOLTAGE GRADE</td>
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<td>4</td>
<td>NO. OF CORES</td>
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<td>5</td>
<td>CONDUCTOR DETAILS:</td>
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<td>2 Neutral Conductor (Sq.mm)</td>
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<td>B No. and size of strands (in mm) of:</td>
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<tr>
<td></td>
<td>1 Phase Conductor (sq.mm)</td>
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<td>2 Neutral Conductor (Sq.mm)</td>
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<tr>
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<td>C SHAPE OF CONDUCTOR</td>
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<td></td>
<td>D Whether compacted or non-compacted</td>
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</tr>
<tr>
<td></td>
<td>E Resistance at 27 °C</td>
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<td>1 Phase Conductor ohm/km</td>
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<td>2 Neutral Conductor ohm/km</td>
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<td>B Colour</td>
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<td>C Thickness</td>
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<td>8</td>
<td>Whether Binder Tape provided</td>
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<td>9</td>
<td>Armoring</td>
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<td>B Dimension (mm)</td>
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<td>B Thickness</td>
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<td>2 Minimum (mm)</td>
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<tr>
<td></td>
<td>C Standard to which it Confirm</td>
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<tr>
<td>11</td>
<td>A Type and size or filler used</td>
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<tr>
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<td>B MIN. WT. OF FILLER IN KG./KM.</td>
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<td>MAX. OVERALL DIAMETER OF THE CABLE IN MM.</td>
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<tr>
<td>13</td>
<td>Nature of Packing</td>
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<td>14</td>
<td>DRUM</td>
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<td>A TARE WEIGHT OF DRUM</td>
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<td>Description</td>
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<tr>
<td>--------</td>
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</tr>
<tr>
<td>B</td>
<td>WHETHER DRUM IS WHEEL MOUNTED.</td>
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</tr>
<tr>
<td>C</td>
<td>STANDARD SPECIFICATION TO WHICH DRUM</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>DRUM DETAILS &amp; DIMENSIONS</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Whether 2-Full Ply Flange Construction or 2-Full Ply plus 1 Segmental layer Flange Construction.</td>
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<thead>
<tr>
<th>1 Drum size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Flange Diameter (d1) (mm)</td>
</tr>
<tr>
<td>B Barrel Diameter (d2) (mm)</td>
</tr>
<tr>
<td>C Centre hole Diameter (d3) (mm)</td>
</tr>
<tr>
<td>D Overall with (L1) (mm)</td>
</tr>
<tr>
<td>E Travers (L2) (mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F Thickness of Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>G Barrel End (Supporting disc or core segment)</td>
</tr>
<tr>
<td>1 Diameter (mm)</td>
</tr>
<tr>
<td>2 Thickness (mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H Stretcher (core carrier Planks )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Number (Min)</td>
</tr>
<tr>
<td>2 Thickness X width (mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I Barrel Battens thickness (core filler Planks)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>J Barrel Middle Supports (Middle core discs)</th>
</tr>
</thead>
</table>

| K Thickness of External Lagging. (mm) |

<table>
<thead>
<tr>
<th>2 DETAILS OF METAL COMPONENTS :</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Clamping Studs with Hexagonal Nuts</td>
</tr>
<tr>
<td>1 Numbers</td>
</tr>
<tr>
<td>2 Diameter (mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B Square or Round Washers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Numbers</td>
</tr>
<tr>
<td>2 Diameter (mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C M.S. Bushes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Numbers</td>
</tr>
<tr>
<td>2 Thickness of Sleeve (mm)</td>
</tr>
<tr>
<td>3 Dimension of Sleeve (mm)</td>
</tr>
<tr>
<td>4 Number of Bolts</td>
</tr>
<tr>
<td>5 Diameters of Bolts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D M.S. /C.I. Centre Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Numbers</td>
</tr>
<tr>
<td>2 Dimensions of Square /Triangular equal sides</td>
</tr>
<tr>
<td>3 Centre Plate Bolts.</td>
</tr>
<tr>
<td>3.1 Numbers</td>
</tr>
<tr>
<td>3.2 Diameter of Bolts (mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E Centre Hole Diameter (mm)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>F Minimum Weight in Kg /Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Aluminum</td>
</tr>
<tr>
<td>2 XLPE</td>
</tr>
<tr>
<td>3 PVC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G Standard Length of cable in meters &amp; its</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>H Whether material bears BIS Certification</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>I BIS License no. &amp; validity</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>J Embossing</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>K Any other particulars</th>
</tr>
</thead>
</table>