GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF THE CHIEF ENGINEER (POWER), TRANSMISSION, PLG & MNG ZONE,
DEPARTMENT OF POWER, VIDYUT BHAWAN- ITANAGAR

No.CE/TPMZ/W-47/2014-15/ Dtd. Ita the. ___th___/2014

MEMORANDUM

The Department of Power has been following a tender procedure of Power
Grid Corporation of India Limited and the Rural Electrification Corporation for turnkey
execution of works after making some modification therein to suit the conditions of the
state. Baring some instances of fraud and cases of submission of fake documents,
these documents has been found to meet the requirement satisfactorily over the past
few years of its operation in execution of APDRP, RGGVY, R-APDRP, and many other
centrally sponsored and State Plan schemes.

It has been further observed that these tender documents have been
edited, modified and changed by different officers in different ways under different
Zones of the department, improvising the documents over the last 7 – 8 years.
Therefore, it has become necessary to make a Standard Bid Document for turnkey
works by removing all those lacunae and inconsistencies, replacing with appropriate
clauses and freeze them for uniform application across the department and centrally
amended from time to time. Moreover, with the changed environment of IT revolution, e-
tendering has become a necessity for quicker, error-free and more transparent
tendering process.

A committee of officers was entrusted with the required job for
Standardization of the Standard Bid Document for turnkey work in Department of Power
vide No.CE/TPMZ/W-47/14-15/1390 (A-G) Dtd.24/01/2014. On the basis of the
recommendations of the committee and in exercise of the responsibility conferred
under govt. order No.PWRS/E-1292/2005/865-76 Dated 23/2/2011, the following
modified procedures for tendering have been ordered for immediate adoption in the
Department of Power.

1. Standard Bid Document, as recommended by the committee of officers,
having adopted in the Department, has been uploaded to the official Website
www.arunachalpower.org.in for downloading & application by all concerned of the Department of Power with immediate effect.

2. The department shall use the Standard Bid Document mentioned herein for inviting tenders of all turnkey works of the Department.

3. All other types of works, other than turnkey works, such as supply contract, erection or work contracts etc. shall continue to be as per CPWD contract forms and as per the procedures for award of works mentioned in the latest CPWD code (manual).

4. The Standard Bid Document shall also be applicable for electronic tendering through its official e-tender portal dop.ar.etenders.in. All the Executive Engineers, both field and planning Divisions, Superintending Engineers, SSWs and all the Chief Engineers of all the Zones shall have to obtain Digital Signature Certificate (DSC) from Certifying Authorities for the purpose of e-tendering. The detailed procedures for obtaining Digital Signature Certificate (DSC) are given in the e-tendering portal of the Department itself.

5. The Standard Bid Document for turnkey contract uploaded in the official website of the department shall not be amended or modified without prior approval of the Chief Engineer (Power), TPIIA Zone. However, any clerical error/ spelling mistake and nomenclature change can be done by the concerned tendering authority. Errors & mistakes, once detected, should be reported to this office for further needful action.

6. Henceforth, all tenders (manual or electronic) shall be prepared by the Division Office, approved by the Competent Authority in single file system, and opened by a Tender Opening Committee, chaired by the Superintending Engineer concerned, in presence of bidders and members of the Committee appointed by the respective Chief Engineers for each of the circles. All stages of the tenders, (i.e. Part-I, Part-II & Part-III) shall be opened by the same Committee, one after the other as per time schedules prescribed by the Chairperson of the Tender Opening Committee.
7. If a work is to be split into two or more packages for tendering purpose, approval of the Chief Engineer shall be mandatory as one time exercise, immediately after accord of sanction by the Competent Authority.

8. When a work is split into smaller packages, the Authority competent to approve the tender shall be based on sum total amount of all the packages, and not based on package-wise amounts.

9. Tender Evaluation and Processing fee of ₹ 5000/- (Rupees Five thousand) only for electronic tendering and ₹ 10,000/- (Rupees ten thousand) only for manual tendering shall be charged as prescribed in the new bid documents in lieu of charging Rs. 15,000/- as cost of tender paper as per the new provisions in the Standard Bid Documents.

Chief Engineer (Power)
Transmission, Planning & Mng Zone
Vidhyut Bhawan-Itanagar
Dtd, Ita the 13th 7/2014

No. CE/TPMZ/ MV-47/2014-15/ 75 8 7 6

Copy to:
1. PS to Minister (Power), for kind information please.
2. The Secretary (Power), Govt. of AP, Jal Vodyut Bhawan- Itanagar, for information.
3. All Chief Engineers, Deptt. of Power, Vidhyut Bhawan, Itanagar for immediate implementation.
4. All Chief Engineers, Jal Vidyut Bhawan, DHPD, Itanagar for information only.
5. All Superintending Engineers (E), Department of Power, Arunachal Pradesh for immediate action.
6. All Executive Engineers, Deptt. of Power, Arunachal Pradesh for immediate action.
7. Incharge, IT Cell, O/o the CE (Power), TPM Zone to upload the SBD documents with copy of this memo

Chief Engineer (Power)
PART-I

PRE-QUALIFICATION AND EARNESTNESS

( Bid Proposal Letter)

OF

NAME OF WORK:-.

UNDER

Sanction No & ref:-

NIT No:-

ESTIMATED COST:- Rs.

Seal & Sign of EE/SE
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
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</tr>
<tr>
<td>2.</td>
<td>Bid Submission Letter(Bid Proposal Sheet)</td>
<td>2-3</td>
</tr>
<tr>
<td>3.</td>
<td>Bank Solvency Certificate</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Bid Guarantee (Earnest Money) enclosed</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>DD for Evaluation &amp; Processing Fees</td>
<td>6</td>
</tr>
</tbody>
</table>
## Annexure-B
(Ref cl 1.2 of INB of Pt-III)

### CHECK LIST

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item Description of actions</th>
<th>Reference where enclosed</th>
<th>Strike out whichever is not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMD/Bid Guarantee</td>
<td>Part-I</td>
<td>Yes/No</td>
</tr>
<tr>
<td>2</td>
<td>DD for Evaluation &amp; Proc fee</td>
<td>Part-I</td>
<td>Yes/No</td>
</tr>
<tr>
<td>3</td>
<td>Bid Submission Letter</td>
<td>Part-I</td>
<td>Yes/No</td>
</tr>
<tr>
<td>4</td>
<td>Bank Solvency Certificate</td>
<td>Annexure-A of Part-I</td>
<td>Yes/No</td>
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<tr>
<td>5</td>
<td>Check List</td>
<td>Annexure-B of Part-I</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6</td>
<td>Qualifying Criteria</td>
<td>Schedule-1 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>7</td>
<td>Commercial Deviations</td>
<td>Schedule-2 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>8</td>
<td>Technical Deviations</td>
<td>Schedule-3 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>9</td>
<td>Addl Informations</td>
<td>Schedule-4 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>10</td>
<td>Organization Informn</td>
<td>Schedule-5 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>11</td>
<td>Firm Price on Turnkey</td>
<td>Schedule-6 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>12</td>
<td>Brought out and Sub-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contracted Items</td>
<td>Schedule-7 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>13</td>
<td>Work Completion Schedule</td>
<td>Schedule-8 of QR of Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>14</td>
<td>Guarantee Declaration</td>
<td>Schedule-9 of QR of Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>15</td>
<td>List of Special Tools &amp; Tackles</td>
<td>Schedule-10 of QR Part-II</td>
<td>Yes/No</td>
</tr>
<tr>
<td>16</td>
<td>Summary Price Proposal</td>
<td>Schedule-1 Part-III (Vol. 1/3)</td>
<td>Yes/No</td>
</tr>
<tr>
<td>17</td>
<td>Summary Price Component</td>
<td>Schedule-2 Part-III (Vol. 1/3)</td>
<td>Yes/No</td>
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<tr>
<td>18</td>
<td>Price Components</td>
<td>Schedule-3 &amp; 4</td>
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</tr>
<tr>
<td></td>
<td>Schedule filled in</td>
<td>of Part-III (Vol. 1/3)</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Date: ..................................................

Place: ..................................................

(Designation)...........................................

(Common Seal)........................................
To

The Executive Engineer (E)
............Electrical Division
Department of Power
.............

Sub:- Bid Submission Letter(BSL)/ Bid Proposal Sheet

Ref: NIT No.

Dear Sirs,

1.0 We, the undersigned Bidder, have read and examined in detail the specifications and documents of the Bid Specification No. DoP/................. for Construction of .......................................................... and hereby propose to do the design, engineering, manufacture, testing at works, supply, transportation to and storage at site, insurance, erection, testing and commissioning of various sub-station equipments, equipment support structures and gantry structures etc. and associated civil works for the turn key works of .......................................................... as detailed in the specifications and documents of the subject bid.

1.1 We are submitting our bids as per the Check List annexed herewith and declare that we exhaustedly made all attempts to fill every columns and forms as required and instructed by you in the tender.

2.0 PRICES AND VALIDITY

2.1 All the prices stated in the bid are FIRM and we shall not claim any price adjustment and price variations irrespective of any price variations of the market. Our prices have been quoted to absorb all market fluctuations and market uncertainties. All the prices and other terms and conditions of this proposal are valid for a period of six (6) calendar months after the date of deadline of bid submission. We further declare that prices stated in our Proposal are in accordance with your "Instruction to Bidders" included in Condition of Contracts, Section INB, Part-III (Vol-1/3) of bid documents.

2.2 We do hereby confirm that we have quoted our prices in the offer after taking into consideration of all overhead expenses, taxes, duties, etc as indicated in your Bid documents. We shall be abided by all tax laws of the state and the central governments.

2.3 We do hereby confirm herewith that we have read the provisions of INB, GCC, ECC and SCC of this tender document in entirety specially relating to the Taxes, Duties and other overheads involving the pricing policy of this contract, declaring that we shall not raise any issues in this regards.

3.0 SPECIAL ATTENTION TO SECTION ‘QR’ AND ‘SCC’

3.1 We do confirm you that we have gone through the entire Bid document and taken special note of the Qualifying Requirement under Section ‘QR’ of Part-II, and the Special Condition of Contract under section SCC and we declare that the bid is submitted after having understood about all the conditions and that we are competent to bid for this tender to best of our knowledge.

3.2 We have understood the definitions of the Turn-Key concept explained in the bid document and accordingly quoted our price with this factor as our liability for which we shall not claim anything extra other than what have been envisaged in this tender.
3.3 We shall point out any discrepancies and confusions to you and come into conclusions with you before the award is made. We shall be abided by such amendments and instructions contained finally in the letter of award.

4.0 BID GUARANTEE & EVALUATION FEES

We have enclosed a Fixed Deposit Receipt for an amount of Rs……..(in words) issued from ……..(Name of Bank) pledged to you as Bid Guarantee as per clause 22.1 of Section INB Part III of contract conditions. We also enclose herewith a DD worth Rs…………..vide DD No……………. as evaluation processing fees of the tender.

5.0 RIGHT TO ACCEPT or REJECT ANY OR ALL BIDS.

We have studied and understood the clause 38.0 of Section INB part-III and declare that we will have no claim of any kind if any part or whole of our Bid is rejected or annul the bidding process at any time and at any stage prior to award of contract, without assigning any reasons. Further, we are aware that such action of the Owner shall be without any liability or obligation to us.

6.0 CONTRACT PERFORMANCE GUARANTEE(CPG)

We further agree that if our offer is accepted, the Contract Performance Guarantee(CPG), of value equivalent to fifteen percent (15%) of the Contract Price, shall be submitted within the prescribed time period, in the form and manner prescribed in your tender. We also assure that we shall keep the CPG re-validated till such time of Closure of the Contract as mentioned in your tender conditions.

7.0 We have inspected the project site and fully got accustomed with the topography and other site conditions, and accordingly submit our bid as per instructions at Clause-9 of INB.

8.0 We do hereby confirm that the contents of this letter are as per the specimen letter of the tender reproduced without any amendments except the following which we have deviated:-

   a) ....
   b) ....

This ...................................... day of .........................................20.. , I Shri/Smti…..……………………….do hereby sign, commit and affirm in the capacity of .........................................................., duly authorized to sign for and on behalf of .........................................................., that we are submitting our bid enclosing the Earnest Money ( Bid Guarantee ) as token of our full earnestness and sincerity which may be forfeited under any conditions of default.

(IN BLOCK CAPITAL LETTERS)

Address:-

Person to be contacted:
Phone landline:
Mobile Number:
Fax Numbers:
E-Mail address:

( the bidder has to write this letter in their pad, and signed by the authorized person over the seal of the bidding firm )
(FORMAT FOR EVIDENCE OF ACCESS TO CREDIT FACILITIES, AVAILABILITY OF LIQUID ASSETS AND SOLVENCY)

BANK SOLVENCY CERTIFICATE

This is to certify that M/s. …………………………………………. (Full Name & Address), who are submitting their bid to the Executive Engineer (E), ……………………… Division, Department of Power, ………………………, against their NIT No. ……………………………. ……………………… dated ……………………………….., is our customer for the past ………….. years.

Their financial transactions with our bank have been satisfactory during this period. They enjoy the following Liquid Assets based on their Deposits, Sanctioned Loans/Over-drafts or credit facilities with us.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Liquid Assets</th>
<th>Sanctioned Limit</th>
<th>Utilized as on date</th>
<th>Balance Available</th>
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</thead>
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<td></td>
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<td>2.</td>
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<td>3.</td>
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</tr>
</tbody>
</table>

Total Liquid Assets available Rs.

This letter is issued at the request of M/s ……………………….

Sd/-

Name of Bank: ………………………………………………………
Name of Authorized Signatory: …………………………………
Designation: ………………………………………………………
Phone No.: ………………………………………………………
Bank code:-
Signatory Code:-

Address: …………………………………………………………………

SEAL OF THE BANK
GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF POWER
BID DOCUMENT

PART-II

QUALIFYING REQUIREMENT (QR)

OF

Name of Work:-

UNDER

Sanction No & ref:-

NIT No:-

ESTIMATED COST: - Rs.

(Seal & Sign for EE/SE)
# BID DOCUMENT

## PART-II

### QUALIFYING REQUIREMENT (QR)

*(Pre-Qualification Data & Deviation Statements)*

*Name of work...*

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<td>Schedule-2; Commercial Deviations</td>
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<td>10</td>
<td>Schedule-8; Work Completion Schedule</td>
<td>17</td>
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<td>11</td>
<td>Schedule-9; Guarantee Declaration</td>
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<tr>
<td>12</td>
<td>Schedule-10; List of Special Tools and Tackles</td>
<td>19</td>
</tr>
</tbody>
</table>
QUALIFYING REQUIREMENT (QR)
QUALIFYING REQUIREMENT (QR) OF THE BIDDER

In addition to the general qualification requirement set forth in clause 2.0 of Section INB Part-III(Vol.1/3) the bidder has to qualify the following criteria for selection to the next stage of the bid:

1.0  The bidder must have pre-qualified in stage I (Part-I).

2.0  EXPERIENCE OF SIMILAR WORKS; The minimum qualifying requirement for completed work experience on each of the types of work in aggregate shall not be less than 50% of the quantity prescribed in aggregate for each of the packages or as may be fixed by the authority more than this benchmark. (to be segregated, defined, quantified and fixed a higher limit by the competent authority for each package/tender as appropriate and list them at Enclosure-1, at Section Enclosures SCC, ref cl 26 of SCC)

3.0  AVAILABLE BID CAPACITY (ABC)

i) The bidder must have their Available Bid Capacity (herein after referred to as ABC) equal to or more than the total bid value. The ABC will be calculated as under:

   \[ ABC = (A*N*M - B) \geq \text{Bid Amount} \]

   Where

   \[ A = \text{Annual average value of Works of similar nature executed during the last five years (updated to the current price level by adding price escalation rate at the rate circulated by DOP, compounded annually) taking into account the completed as well as works in progress.} \]

   \[ N = \text{Number of years prescribed for completion of the works for which bids are invited (period up to 6 months to be taken as half-year and more than 6 months as one year).} \]

   \[ M = 2.5 \]

   \[ B = \text{Value (updated to current price level) of existing commitments and on-going works to be completed during the period of completion of the works for which bids are invited.} \]

   ii) Assessment of ABC should be made and supported by a statement of audited accounts and statement of details of works completed and in hand supported further by copies of work orders and other relevant documents duly certified a chartered accountant in case of private works and by an officer not below the rank of an Executive Engineer/AGM in case of govt or semi-govt works or by both in each case as may be required for authenticity. (Calculations be shown in annexure)

4.0  The bidder-

   (i) shall submit the bids as single firm and submit an affidavit to that effect as per clause-10 of section INB, Part-III(Vol-I/3).

   (ii) must fill up the GTP fully and leaving it blank would entail rejection outright.
(iii) must be free from all legal encumbrance and submit an affidavit to that effect.
(iv) must submit supporting documents of legal status namely like contractor registration/license/Company registration etc.

5.0 The average annual turnover of the bidders for the best three financial years out of last five (5) financial years of the bidder as annualized should be at least **50% of the estimated cost or the bid amount whichever is more.**

6.0 The bidder shall have Liquid Assets (LA) and/or evidence of access to or availability of credit facilities of not **less than 30% of the estimated cost or the bid amount whichever is more.** The bidder shall furnish documentary evidences in support of the qualifying requirement stipulated above as per QR of Part-II and as per **Annexure-“A” in Part-I.**

7.0 The bidder shall clearly list out all Commercial or Technical deviations from the bid stipulation as per **Schedule-2 & Schedule-3** of this document.

8.0 The bidder shall list out all additional information furnished along with the bid as per **Schedule-4** of this document.

9.0 The bidder shall list out all information regarding ex-employees of the Department of Power, Arunachal Pradesh, as per **Schedule-5** of this document.

10.0 The bidder shall declare that their prices are firm basis as per **Schedule – 6** of this document.

11.0 The bidder has to expressly commit through an affidavit that he has understood the entire project requirements and execute the entire work as a single turnkey work for which he has quoted his price inclusive of the following conditions:-

   a) All materials of supply with its associated accessories and fittings to fulfill the requirement of the successful operation as per the minimum specified level of performance as per GTP or GTC whichever is better in case of any conflicts.

   b) All associated software and drivers of the system to fulfill the requirement of successful operation as per the specified level of performance in this contract.

   c) All customized items and designs as may be required to fulfill the desired objectives of this contract, but not expressly described in the specifications and the GTP, shall have to be included in this tender as standard accessories without extra cost.

   d) Shall operate and maintain the assets created under this contract seamlessly for the entire period, provided that “Maintenance of Assets” is defined in the Special Conditions of Contract (SCC).

   e) Shall place adequate trained technical manpower in the project for maintaining and training of the departmental staff for gradual take over during the period.

   f) That the bid price quoted is inclusive of all the contingency expenses which also include cost of land acquisition, ROW, site development, approaches etc as mentioned in the clause “Turn-key Concept and Completeness of Work” in the SSC.

   g) Any additional items (DOP official only) ref clause 26 of SCC, Enclosure-2
12.0 DIS-QUALIFICATION

I) The bidder, even after qualifying the above criterion and succeed this contract, shall face disqualification as breach of contract, at any stage during the validity of this contract if the information furnished are proved to be false after verification.

II) The bid shall be rejected outright at the initial stage itself if the bidder has:-

   a) Left any of the QR unfulfilled or kept unattended or information given is not in the right envelope as described herein this document.

      OR

   b) Made misleading or false representations in the forms, statements, affidavits and attachments submitted in proof of the qualification requirements;

      OR

   c) A record of poor performance, such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures or found blacklist or de-registered by any state/central govt agencies.

      OR

   d) Participated in the previous bidding for the same work and rejected on the grounds of any malpractice or fraudulent acts or unethical & immoral acts.

      OR

   e) Not furnished certified supporting statements and documents with list of contact details of the persons providing or certifying the documents.

**********
SCHEDULES
Dear Sirs,

In support of our meeting the Qualifying Requirements (QR) for Bidders, stipulated in the QR Section of Part-II of Bidding Documents, we furnish herewith, the details/documents/confirmations etc. as follows:

1.0 Constitution or legal status of the Bidder

1.1 Copies of original constitution, place of registration and principal place of business are enclosed with our Bid at ............... (Attachment No. to be indicated).

1.2 Written power of attorney defining the authorized signatory of the bid on behalf of the bidder is enclosed herewith our Bid at ......... (Attachment No. to be indicated).

1.3 The qualification and experience of key personnel proposed for carrying out the work are indicated in the format given at 2.7 of Schedule-1. Other supporting documents are enclosed at ......... (Attachment No. to be indicated).

2.0 (Reference: Clause 3 of QR - Section of Part-II)

2.1 We meet the stipulated QR, as mentioned at clause No.3 of Part -II based on the following:

2.1.1 Qualifying informations:

a). Table-A: Completed Works.

Name of Bidder:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Project</th>
<th>Description of work</th>
<th>Name of customer/ Employer</th>
<th>Value of Contract</th>
<th>Contract no and date of Order</th>
<th>Stipulated Date of completion</th>
<th>Actual date of completion</th>
<th>No. of years of satisfactory operation as on date of bid opening</th>
<th>Sl. No of Certificate enclosed as attachment</th>
</tr>
</thead>
</table>
b). Table B: Ongoing Works and Existing Commitments.

Name of Bidder:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Project</th>
<th>Description of work</th>
<th>Name of customer/Employer</th>
<th>Value of Contract</th>
<th>Contract no and date of Order</th>
<th>Stipulated date of completion</th>
<th>Expected date of actual completion</th>
<th>Sl. No of Certificate enclosed as attachment</th>
</tr>
</thead>
</table>

*Name of the proposed sub-contractor is …………………………………………………

Documents in support of Para 2.1 above are enclosed with our bid at ……. (Attachment No. to be indicated).

**Note:** Continuation sheets, of like size and format, may be used as per bidder's requirements and annexed to this Schedule and suitably put cross reference.

2.1.2 Calculation of ABC in pursuant to clause 3.0 of Section QR, part II.

\[ \text{ABC} = A*N*M-B \geq \text{Bid amount} \]

(Note: The Bidder must calculate the ABC and indicate the calculation here.)

2.2 (Reference: Para 4.1 of QR Section of Part-II)

2.2.1 We have submitted our Bid as a Single Firm/Company who meets all the qualification requirement set forth in clause 1 through to 12 of QR-Section of Part-II as per stipulated qualifying requirements are furnished in the format given at tables A and B along with customer’s certificate towards satisfactory operation.

*Documents in support of above are enclosed with our Bid at ……. (Attachment No. to be indicated).*
Note: 1. Continuation sheets, of like size and format, may be used as per Bidder’s requirements and annexed to this Schedule.

2.3  *(Reference: Clause 1 through 12 of QR-Section of Part-II) [Single Firm]*

2.3.1 The details/documents, required as per above are included/furnished in our bid as indicated below:

i) We confirm that our *Minimum Average Annual Turnover* for the best three years out of last five financial years is Rs. ............... (in figures and words…………………………………… ……… ……… …… …… …… ……………………).

ii) We hereby confirm that our *Liquid Assets* and/or evidence of access to or availability of *Credit Facilities* as on …… (Date) is Rs. ......... (in figures and words…………………………………………………………………………………..)

2.4  *(Reference: Clause 1 through 12 of QR-Section of Part-II)*

2.4.1 i) A certificate from the Banker(s) as per format, *Annexure-A* is enclosed in Part-I (as stipulated in QR) with our Bid at …… (Attachment No. to be indicated).

ii) Annual Reports/Profit & Loss Statement/Balance Sheets together with Additional Statements of Accounts for last five years are enclosed with our Bid at …… (Attachment Nos. to be indicated)

iii) Details of data/documents, as stipulated in QR, is enclosed with our Bid at …… (Attachment No. to be indicated).

2.5  *Description of Plants, Tools and Tackles*

<table>
<thead>
<tr>
<th>Item of equipment</th>
<th>1. Name of Manufacturer</th>
<th>2. Model and power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3. Capacity</td>
<td>4. Year of manufacture</td>
</tr>
<tr>
<td></td>
<td>5. Current Location</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Details of current commitments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Indicate source of the equipment (tick)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Owned □ Rented □ Leased □ Specialty manufactured</td>
<td></td>
</tr>
</tbody>
</table>

Omit the following information for equipment owned by the Bidder.

<table>
<thead>
<tr>
<th>Owner</th>
<th>8. Name of Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9. Address of Owner: …………………………………</td>
</tr>
<tr>
<td></td>
<td>Telephone</td>
</tr>
<tr>
<td></td>
<td>Fax</td>
</tr>
<tr>
<td>Agreement</td>
<td>Details of rental/lease/manufacture agreements specific to the project.</td>
</tr>
</tbody>
</table>

For each manufacturer, separate sheet should be used.
### 2.6 Annual Turnover Data for the last Five years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
</tbody>
</table>

### 2.6(a) Details of Financial Standing:

<table>
<thead>
<tr>
<th>Financial information in Indian Rupees</th>
<th>Actual</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous Five Years</td>
<td>Next Five Years</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>1. Total Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Current Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Total Liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Current Liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Profit before Taxes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Profit after Taxes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.6(b) Proposed resources of financing to meet the cash flow demands of the Project, net of current commitments.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Resources of Financing</th>
<th>Amount (Indian Rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.6(c) Details of Bidder’s banks:

<table>
<thead>
<tr>
<th>Banker</th>
<th>Name of Banker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Address of Banker: ....................................</td>
</tr>
<tr>
<td></td>
<td>Telephone</td>
</tr>
<tr>
<td></td>
<td>Fax</td>
</tr>
<tr>
<td></td>
<td>Telex</td>
</tr>
</tbody>
</table>

### 2.6(d) Litigation History:

<table>
<thead>
<tr>
<th>Year</th>
<th>Award FOR or AGAINST the Bidder</th>
<th>Name of client, cause of litigation and matter in dispute</th>
<th>Disputed amount (Current Value in Indian Rupees)</th>
</tr>
</thead>
</table>
2.7 Details of qualification and experience of key personnel proposed for carrying out the works.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Personnel</th>
<th>Degree/Diploma</th>
<th>Branch</th>
<th>Year of Passing</th>
<th>From</th>
<th>To</th>
<th>Name of Employer</th>
<th>Position held</th>
<th>Responsibilities/Relevant experience</th>
</tr>
</thead>
</table>

Date: ........................................................

Place: ........................................................

(Signature) ...........................................

(Printed Name) .................................

(Designation) .................................

(Common Seal) ..................................

Note: 1. Continuation sheets, of like size and format, may be used as per Bidder’s requirements and annexed to this Schedule.
Dear Sirs,

Subject: Commercial Deviations for Package.

After having read the entire bid document, we are of the opinion that the following deviations in the terms and conditions are required to be clarified or confirmed before the award is made in our favour and accepted. These deviations and variations are exhaustive and all other terms and conditions, except for these deviations, the entire work shall be performed as per your specified terms and conditions prescribed in this document. Any cost implications due to these deviations if implemented are separately annexed to the Schedule-4 (BOQ) in Part-III (Vol-1/3).

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Volume/Clause</th>
<th>Ref./Page No.</th>
<th>As specified in the tender</th>
<th>Commercial Deviation we proposed to remove anomalies/errors</th>
<th>Cost Implications (strike out whichever is not applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
</tr>
</tbody>
</table>

(Bidder may submit in broader sheet without disclosing the costs in it)

Date: (Signature)..................................................

Place: (Printed Name)..........................................

(Designation).............................................

(Common Seal).............................................

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
Dear Sirs,

Sub. : Technical Deviations for the Package.

The following are the Technical Deviations, we have noticed and we intent to deviate from your Technical Specifications and General Technical Conditions in tender, which we have considered necessary for review before our tender is accepted. These deviations and variations are exhaustive and accordingly we have quoted our prices in the BOQ and our GTP has been submitted as per these deviations. Except for these deviations, the entire work shall be performed as per your specifications and documents. Where ever any cost implications has occurred, cost deviations also have been annexed to the price schedule 4 (BOQ) in Part III(Vol-1/3).

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Volume/Clause</th>
<th>Ref./Page No.</th>
<th>As specified in the TS or GTC</th>
<th>Technical deviation and variation to the specification</th>
<th>Cost Implications (strike out whichever is not applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
<td>Inc/Dec/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
<td>Inc/Dec/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inc/Dec/No</td>
<td>Inc/Dec/No</td>
</tr>
</tbody>
</table>

(Bidder may submit in broader sheet without disclosing the costs in it)

Date: ..........................................................

Place: ..........................................................

(Signature)..........................................................

(Printed Name)..................................................

(Designation)..................................................

(Common Seal).................................................

Note: 1. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

2. The deviations and variations, if any, shall be brought out separately for each of the equipment.
Dear Sirs,

We have enclosed with our proposal the following additional information for the subject package.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date:  (Signature)..................................................

Place:  (Printed Name).............................................

  (Designation)...................................................

  (Common Seal)..................................................  

**Note:** Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
### Information regarding Organizational Set Up

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Person with designation in Arunachal pradesh Department of Power</th>
<th>Date of Retirement/resignation from Arunachal Pradesh Department of Power</th>
<th>Date of joining and designation in our Organization</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>
</tbody>
</table>

Date: (Signature)....................................................

Place: (Printed Name).............................................

(Designation).................................................

(Common Seal).................................................
FIRM PRICE DECLARATION

<table>
<thead>
<tr>
<th>Bidder's Name &amp; Address</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Executive Engineer (E)</td>
</tr>
<tr>
<td></td>
<td>............... Electrical Division</td>
</tr>
<tr>
<td></td>
<td>Department of Power</td>
</tr>
<tr>
<td></td>
<td>...............</td>
</tr>
</tbody>
</table>

After having understood the contents of the entire Bid Document of the tender, we do hereby solemnly affirm and declare that the unit prices quoted are firm and inclusive of all over head expenses and margins for fulfillment of the contract as a result of this tender on turn-key concept, pursuant to clause 33 of Section GCC and other relevant clauses in the document. We do further declare that we shall not seek for any extra payment for any such extra items for completeness of work under turn-key concept of this work; in pursuant to clause 14 of SCC and our quoted unit prices are inclusive of such unforeseen items. All such needs, as may be felt necessary by us or by the owner, required for fulfillment of the work under this contract, shall be met by us without any claim to the owner.

Date:   (Signature)................................ ...................

Place:   (Printed Name)............................ ................

(Designation)................................... ...............

(Common Seal)............................................
# Bought-Out & Sub-Contracted Items

**Bidder’s Name & Address**

To

The Executive Engineer (E)

Electrical Division

Department of Power

———

We hereby furnish the details of the items/sub-assemblies amounting to more than 10% of our bid price; we propose to buy for the purpose of subject package.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item Description</th>
<th>Qty. Proposed to be bought/Sub-contracted</th>
<th>Source of Supply</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>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Date:  
(Signature): ..............................................

Place:  
(Printed Name): ..............................................

(Designation): ..............................................

(Common Seal): ..............................................
We hereby declare that the following Work Completion Schedule shall be followed by us for the subject package. The contractor has to make this work completion schedule supported by CPM/PERT or Bar chart as per his/their own plan but within the total completion time given in this tender. The contractor has to determine the work components on the Critical Path of the CPM or PERT graphs for the project and list them hereunder in the format with the time-line.

(The items of work shown in the format below are not necessarily to be followed as they are shown as examples for guidance).

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Work Components on the Critical Path</th>
<th>Period in Months (from the date of LOA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Establishment of first site office</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Procurement Order of First Lot (&lt;=33%)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Completion of detailed engineering and Survey</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Submission of Drawing &amp; Designs for Approval</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Establishment of all site offices</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Procurement Order of second lot(&lt;=33%)</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Erection works of first Lot</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Submission of BOQ with Deviations if any</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Procurement order last Lot</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Erection of second lot</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Erection of all lots</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Pre-Commissioning tests and checks</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Replacement/removal of defects and final Testing</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Commissioning for commercial operation</td>
<td></td>
</tr>
</tbody>
</table>

Date: ..................................................
Place: ..................................................
Guarantee Declaration

<table>
<thead>
<tr>
<th>Bidder's Name &amp; Address</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Executive Engineer (E)</td>
</tr>
<tr>
<td></td>
<td>.................Electrical Division</td>
</tr>
<tr>
<td></td>
<td>Department of Power</td>
</tr>
<tr>
<td></td>
<td>.............</td>
</tr>
</tbody>
</table>

Dear Sirs,

We declare that the ratings and performances of the items and other equipments covered under this contract are guaranteed as per contract guarantees or the manufacturer’s guarantees whichever would be longer. We further declare that in the event of any deficiencies in meeting the guarantees in respect of the characteristics mentioned in the GTP or the TS, as the case may be, which may be established after conducting various tests, you may, at your discretion, reject or accept the equipment, we shall repair or replace or agree for any damage after assessing the liquidated damages as appropriate under this contract.

Date: ...................................................

(Signature): ...................................................

Place: ...................................................

(Printed Name): ...................................................

(Designation): ...................................................

(Common Seal): ...................................................
List of Special Tools & Tackles

Bidder's Name & Address

To
The Executive Engineer (E)

………………..Electrical Division
Department of Power

………………..

We are furnishing below the list of special tools & tackles for installation & commissioning of the equipments for subject package. The prices for these tools & tackles are already included in the lump sum bid price and we undertake to handover these items to you at the time of completion of the work.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Equipment</th>
<th>Item Description</th>
<th>Unit</th>
<th>Qty.</th>
</tr>
</thead>
</table>

Date: ..........................................................

Place: (Printed Name).....................................

..................................................

..................................................

..................................................

..................................................

END OF SCHEDULES OF QR
GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF POWER
BID DOCUMENT

PART-III
(Volume-1/3)

CONDITIONS OF CONTRACT
&
PRICE BID
for
TURN-KEY WORK (SUPPLY-CUM-ERECTION)
FOR

Name of work:-………………………………..

UNDER

Sanction No. & Ref:-………………………………..

NIT No:-

ESTIMATED COST: Rs.

(Seal & Sign for EE/SE)
### BID DOCUMENT

**Part-III**  
**(Volume-1/3)**  

**CONDITIONS OF CONTRACT**  
**TURN-KEY (SUPPLY-CUM-ERECTION)**  
**WORK OF**  

*(........ NAME OF WORK....)*

### LIST OF CONTENTS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Contents (Sections Containing Conditions of Contract)</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Section – NIT: Press NIT or e-NIT</td>
<td>1-3</td>
</tr>
<tr>
<td>2</td>
<td>Section – NIT: manual NIT.</td>
<td>4-5</td>
</tr>
<tr>
<td>3</td>
<td>Section – NIT: e-NIT</td>
<td>6-7</td>
</tr>
<tr>
<td>4</td>
<td>Section – INB: Instruction to Bidders.</td>
<td>8 to 26</td>
</tr>
<tr>
<td>5</td>
<td>Section – GCC: General Terms &amp; Conditions of Contract.</td>
<td>27 to 53</td>
</tr>
<tr>
<td>6</td>
<td>Section – ECC: Erection Conditions of Contract.</td>
<td>54 to 75</td>
</tr>
<tr>
<td>7</td>
<td>Section – SCC: Special Conditions of Contract.</td>
<td>76 to 85</td>
</tr>
<tr>
<td>8</td>
<td>Section - GTC: General Technical Condition.</td>
<td>86 to 95</td>
</tr>
<tr>
<td>9</td>
<td>Section – Proforma (Specimen Proforma-I to IX)</td>
<td>96 to 118</td>
</tr>
<tr>
<td>10</td>
<td>Section- Enclosures 1 to 9</td>
<td>119 to 132</td>
</tr>
<tr>
<td>11</td>
<td>Section- Schedule 1 and 2</td>
<td>133 to 136</td>
</tr>
<tr>
<td>12</td>
<td>Section- Schedule 3</td>
<td>137</td>
</tr>
<tr>
<td>13</td>
<td>Section- Schedule-4 BOQ</td>
<td>138-</td>
</tr>
</tbody>
</table>
NOTICE INVITING TENDER (NIT)
NOTICE INVITING TENDER (NIT)

Note:-
The specimen Press Notice and Notice Inviting Tender Hereunder shall be prepared, signed and issued and placed as Enclosure-3 and 4 at section “Enclosures” Part-III(Vol-1/3) [ ref cl 26 of SCC.]
PRESS NOTICE INVITING TENDER (e-TENDER)

No. ________________________        Dtd.________

On behalf of the Governor of Arunachal Pradesh, the EXECUTIVE ENGINEER (ELECT),..............
...............DIVISION, ................., Deptt. of Power, Govt. of Arunachal Pradesh, invites tenders
e-tenders in our e-tendering site at dop.ar.etenders.in from eligible and reputed, contractors, manufacturers,

service providers and system integrators for turnkey/work execution of the work

for submission on or
before .....th ..... 20.... as per details of time schedule mentioned the NIT posted at dop.ar.etenders.in for e-
tendering and) www.arunachalpower.org.in for viewing and pre-assessment.

Sd/-
The Executive Engineer (E)

No.______________________________                Dt d.________

Copy to:-
1) PPS to HCM for information to the Hon'ble Chief Minister.
2) PS to HMP, for information to the Hon'ble Minister (Power).
3) The Hon'ble Parliamentary Secretary (Power), for information
4) PS to Chief Secretary, Govt. of AP, ................., for information.
5) The Secretary (Power), Govt. of AP, ................., for information.
6) The Chief Engineer (Power),TPM Zone, Eastern, Western, & Central Electrical Zone,
7) All Superintending Engineers, Department of Power, Arunachal Pradesh.
8) All Executive Engineers, Deptt. of Power, Arunachal Pradesh.
9) The Director of Information & Public Relations, Naharlagun, with a request to get the enclosed
Press Notice (NIT) published in any English papers of two(2) national dailies, any one of regional
papers published from Guwahati and any two of local dailies published from Itanagar/Naharlagun on
or before .....th ....... 20....
10) Notice Board
11) I. T. Section, O/o the CE(P), TP&M, for uploading of the NIT & other tender documents on or before th

The Executive Engineer (E)

Department of Power
79....
GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF THE EXECUTIVE ENGINEER (ELECT) .................... ELECTRICAL DIVISION,.............
DEPARTMENT OF POWER

No. _________________________________             Dtd.________

NOTICE INVITING TENDER

On behalf of the Governor of Arunachal Pradesh, the EXECUTIVE ENGINEER (ELECT) .................. DIVISION, .................., Deptt. of Power, Govt. of Arunachal Pradesh invites tenders from eligible and reputed Contractors, manufacturers, Service Providers and System Integrators for turnkey/work execution, test-operation and test-maintenance of the following work as per the schedule given herein:-

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of work/Packages</th>
<th>Estimate cost of the work (Rs.lacs)</th>
<th>Bid guarantee amount (Rs. lacs)</th>
<th>Date and Time for Tender sale</th>
<th>Last date and time of receipt of application for purchase of tender document(s)</th>
<th>Last date &amp; Time for submission of tender document(s)</th>
<th>Date &amp; Time for opening of tender</th>
<th>Evaluating &amp; Processing Fee (Non Refundable) In Rs.</th>
<th>Completion time</th>
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1. The Bid Documents have been uploaded to the official portal at www.arunachalpower.org.in. No other documents except downloaded from this site shall be accepted in this tender.
2. The bid documents may be downloaded freely from this website and the prospective bidders need to study the document thoroughly and prepare the tender and its accompanying documents.
3. The bids are to be accompanied by a Demand Draft of Rs.10000/- as evaluation and processing fee for manual tendering, in favour of the Executive Engineer (E), .................. Division, payable at SBI.................., duly enclosed with the Earnest Money/Bid Security.
4. The bid document shall consist of the following parts namely, Part-I (Bid Guarantee and Bid Proposal Letter), Part-II (Qualification Requirement) and Part-III (Condition of Contract, Technical Specifications, BOQ schedules)
5. All the documentations shall be in the name of Executive Engineer(E)..................Division..................
6. The bid are to be submitted as per instructions given in the Section INB and the conditions of entire bid documents and submitted to the following address, where the tenders would be opened.

The Superintending Engineer
.................. Circle
Department of Power
..................- 79.....

7. A pre-bid conference shall be taken by the .................., .................. with the intending bidders at 1030 Hrs. on ....th ...... 20.. to clear any doubts and confusions with regard to the procedure for filling up the tender documents.
8. For any other information, Executive Engineer (E), ................. Electrical Division, Department of Power, ................. may be contacted at ................. (O),036 ........ , (Fax) or email to :  

The Department of Power reserves the right to cancel or withdraw this tender or award in part or reject any or some of the bid(s) without assigning any reasons and the Department shall not be liable for any kind of liability for such decision.

The Executive Engineer (E)  
..............................Division  
Department of Power  
......................- 79........

No. ____________________          Dtd. ________
Copy to:-
1. PPS to HCM for information to the Hon'ble Chief Minister.
2. PS to HMP, for information to the Hon'ble Minister (Power).
3. The Hon'ble Parliamentary Secretary (Power), for information  
4. PS to Chief Secretary, Govt. of AP, ................., for information.  
5. The Secretary (Power), Govt. of AP, ................., for information.
6. The Chief Engineer (Power), TPM Zone, Eastern, Western, & Central Zone, .................  
7. All Superintending Engineers, Department of Power, Arunachal Pradesh.
8. All Executive Engineers, Deptt. of Power, Arunachal Pradesh.
9. The Director of Information & Public Relations, Naharlagun, with a request to get the enclosed Press Notice (NIT) published as per request made therein.
10. Notice Board
11. I.T. Section, O/o the CE(P), TP&M, for uploading of the NIT & other tender documents.

The Executive Engineer (E)  
.............................. Division  
Department of Power  
......................- 79........
GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF THE EXECUTIVE ENGINEER (ELECT) ………….. ELECTRICAL DIVISION, ………………..
DEPARTMENT OF POWER

No. _________________________________             Dtd.________

NOTICE INVITING e-TENDER

On behalf of the Governor of Arunachal Pradesh, the EXECUTIVE ENGINEER (ELECT) …………………….. DIVISION, ……………….., Deptt. of Power, Govt. of Arunachal Pradesh invites e-tenders from eligible and reputed Contractors, manufacturers, Service Providers and System Integrators for turnkey/work execution, test-operation and test-maintenance of the following work as per the schedule given herein:-

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<tr>
<th>Sl. No</th>
<th>Name of work/Packages</th>
<th>Estimate cost of the work (Rs.lacs)</th>
<th>Bid guarantee amount (Rs. lacs)</th>
<th>Date and Time for Tender sale</th>
<th>Last date and time of receipt of application for purchase of tender documents</th>
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1. The prospective bidder(s) are requested to register themselves at our e-tendering portal dop.ar.etenders.in. They are requested to understand the e-tendering procedures given therein before bidding in our e-tender portal.
2. The bid documents are freely available in the e-tendering website which can be downloaded.
3. The bidder has to upload the scanned copy of the Bid Guarantee/EMD and all required documents as prescribed in the Bid document.
4. The electronic bidder are to pay Evaluation & Processing fee of Rs.5000/- by demand draft, payable to the undersigned and uploaded along with the EMD/Bid Guarantee and originals submitted in the manner prescribed at the time of opening.
5. The electronic bidders are to pay Platform Service Fees to the e-tendering service providers as prescribed therein the portal and scanned copy of the receipt or reference of such payment/transaction be uploaded with the Bid guarantee.
6. All the (specimen/formats) documentations prescribed in the tender shall be downloaded from the e-tender portal, prepare them and upload the scanned copies into the portal in the prescribed timeframe. No other documents other than posted in our e-portal shall be applicable for the tenders.
7. The bidders, who have successfully uploaded their bids in complete shape, shall have to bring all the original documents at the time of opening of the e-tenders and submit them to the e-tender opening authority for further processing and verifications.
8. Each of the packages mentioned in the table above shall be treated as separate tenders. But for the purpose of assessing the Bid Capacity and other Qualifying Requirements, bidders submitting tenders for more than one package of this tender shall have to declare themselves in the respective documentations.
9. The bids and all documentations shall be addressed to the Executive Engineer (E), ................. Division, ................................ and submitted/uploaded to the e-tender portal and the originals to the tender opening authority at the time of opening.

10. In case of e-tendering, only one set of the original documentations prepared along with the bid document consisting of the following parts namely, Part-I (Bid Guarantee and Bid Proposal Letter, Bank Solvency Certificates), Part-II (Qualification Requirements) and Part-III (Conditions of Contract, Technical Specifications, etc.) without the BOQ.

11. A pre-bid conference shall be taken by the ............., .................. with the intending bidders at 1030 Hrs. on ....th .... 20.. to clear any doubts and confusions not only about the proposed work/packages but also with regard to the procedure for e-tender, etc.

12. For any other information, Executive Engineer (E), .................., Division, Department of Power, ............., may be contacted at .................. (O),036 ......., (Fax) or email to ..................

The Department of Power reserves the right to cancel or withdraw this tender or award in part or reject any or some of the bid(s) without assigning any reasons and the Department shall not be liable for any kind of liability for such decision.

The Executive Engineer (E)  
...............Division  
Department of Power  
...............- 79.........

No. ____________________ Dtd.______ __
Copy to:-
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5. The Secretary (Power), Govt. of AP, .................., for information.
6. The Chief Engineer (Power), TPM Zone, Eastern, Western, & Central Zone, ..................
7. All Superintending Engineers, Department of Power, Arunachal Pradesh.
8. All Executive Engineers, Deptt. of Power, Arunachal Pradesh.
9. The Director of Information & Public Relations, Naharlagun, with a request to get the enclosed Press Notice (NIT) published as per request made therein.
10. Notice Board
11. I.T. Section, O/o the CE(P), TP&M, for uploading of the NIT & other tender documents.

The Executive Engineer (E)  
...............Division  
Department of Power  
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INSTRUCTIONS TO BIDDERS
(INB)
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SECTION – INB

INSTRUCTION TO BIDDERS

A. INTRODUCTION

1.0 GENERAL INSTRUCTIONS

1.1 The Department of Power, Government of Arunachal Pradesh (implementer of the project) hereinafter called ‘Owner’ will receive bids in respect of equipment to be furnished and erected as set forth in the accompanying Specifications. All bids shall be prepared and submitted in accordance with these instructions.

1.2 A check list has been prepared and enclosed as Annexure-B to Part I. The check list is not exhaustive but only provides some important documentations and requirements for the bidder not to miss them. Fulfillment of documentations and requirements listed in the check list shall not free the bidder from fulfillment of all other requirements and documents of the tender.

2.0 QUALIFYING REQUIREMENTS OF BIDDERS

2.1 The Qualifying Requirement (QR) of this Bid Package has been stipulated in Part-II of this document and that shall be the criterion for qualifying the bid. The bidder shall have to provide satisfactory evidence for the following general qualification requirements which further qualify the conditions of the Qualifying Requirement in part II.

2.2 This Bidding is open to any manufacturer/erector/Contractor/Firm or as defined in the Qualifying Requirement that provides satisfactory evidence concerning the following that he:

a. is a qualified manufacturer/erector/Contractor/Firm who regularly manufactures or installs the equipment of the type specified and has adequate technical knowledge and practical experience;

b. 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);

c. has adequate financial stability and status to meet the financial obligation pursuant to the scope of the works (the Bidders should submit at least 5 copies of their profit and loss account and balance sheet for the last five years);

d. has adequate field services organization 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

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

2.2.1 Majority publicly owned enterprises domiciled in India may be eligible to qualify if, in addition to meeting all the qualifying requirements, they also:

a. are commercially oriented legal entities distinct from Department of Power and are not a government owned department;
b. are financially autonomous, as demonstrated by requirements in their constitutions to provide separate audited accounts and return on capital, powers to raise loans and obtain revenues through the sale of goods or services; and

c. are managerially autonomous.

d. In addition, the qualifying requirements stated in the accompanying ‘Special Condition of Contract’ also apply.

2.3 The above stated requirements are a minimum and **Department of Power 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 **Department of Power**, the qualification data is incomplete or the Bidder is found not qualified to satisfactorily perform the Contract.

3.0 **COST OF BIDDING, TENDER EVALUATION AND PROCESSING FEE.**

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

3.2 Tender Evaluation and Processing fee amount mentioned in Enclosure-9 of Section Enclosures of SCC, Part-III(Vol-1/3), shall be in the form of a Demand Draft in favour of the Executive Engineer concerned and attached in the Part-I of the Bid.

3.3 In case of e-tendering, the bidder may be asked to pay some nominal platform charge directly on-line through electronic means by the Service Provider. Receipts/Reference of such transactions shall also be submitted along with the Bid Guarantee.

**B. THE BIDDING DOCUMENTS**

4.0 **CONTENTS OF BIDDING DOCUMENT**

The goods and services required, bidding procedures and Contract terms are prescribed in the Bidding Document.

In addition to the Invitation to Bids, the Bidding Documents of this part is a compilation of the following sections:

a. Instructions to Bidders –Section INB.

b. General Conditions of Contract -Section GCC.

c. Erection Conditions of Contract-Section ECC.

d. Special Conditions of Contract-Section SCC.

e. General Technical Condition-Section GTC.

f. Guaranteed Technical Particulars GTP

g. Bid Form and Price Schedules.

h. Technical Data Sheets.

5.0 **UNDERSTANDING OF BID DOCUMENTS**

A prospective Bidder is expected to examine all instructions, forms, specifications, terms and conditions of 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 by the Bid document or submission
of a Bid not substantially responsive to the Bid document in every respect will be at the Bidder’s risk and may result in the rejection of its bid.

6.0 CLARIFICATIONS ON BID DOCUMENTS

6.1 If the prospective Bidder finds discrepancies or omissions, in 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 Department of Power in triplicate. The Department of Power, then, will issue interpretation(s) and clarification(s) as he may think fit in writing. After receipt of such interpretation(s) and clarification(s), the Bidder may submit his bid but within the time and date as specified in the Invitation to Bid. All such interpretations and clarifications shall form a part of the Bidding Document and shall accompany the Bidder’s Proposal. A prospective Bidder requiring any clarification on Bidding Document may notify Department of Power in writing. Department of Power will respond in writing to any request for such clarification of the Bidding Document which it receives not later than fifteen (15) days prior to the deadline for submission of bids prescribed by Department of Power. Written copies of Department of Power’s response (including an explanation of the query but without identifying its source) will be sent to all prospective Bidders who have received the Bidding Document.

6.2 Verbal clarification and information given by Department of Power or his owner(s) or his representative(s) shall not in any way be binding on Department of Power.

7.0 AMENDMENT TO BIDDING DOCUMENT

7.1 At any time prior to the deadline for submission of bids, Department of Power 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 notified in writing or by telex or cable to all prospective Bidders, which have received the Bidding Document at the address contained in the letter of request for issue of Bidding Document from the Bidders. Department of Power 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, Department of Power may, at its discretion, extend the deadline for the submission of bids by a maximum period of 15 days.

7.4 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 Department of Power 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 LOCAL CONDITIONS
9.1 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. Department of Power shall not entertain any request for clarifications from the Bidders, regarding such local conditions.

9.2 It must be understood and agreed that such factors have properly been investigated and considered while submitting the Proposals. No claim for financial adjustment to the Contract, awarded under these specifications and documents, will be entertained by Department of Power. Neither any change in the time schedule of the Contract nor any financial adjustments arising thereof shall be permitted by the Owner, which are based on the lack of such clear information or its effect on the cost of the Works to the Bidder.

10.0 DOCUMENTS COMPRISING THE BID

The Bid document consists of Three (3) Part namely, Part-I, Part-II & Part-III. The Bid shall be submitted in 3 (three) parts in separate sealed envelops along with each part of the Bid volumes properly super-scribed as follows:

Part-I: Bid Guarantee: This part of the tender shall contain the following documents enclosed:-

   a) Bid Proposal Letter or prescribed covering letter,
   b) Check list (Annexure-B in Part-I)
   c) Bank solvency certificate as per annexure A in Part I.
   d) Bid Guarantee prepared as per clause 22 of INB of the Bid Document.
   e) Demand Draft for Tender Evaluation & Processing.

Part-II: Qualification Requirement (QR): This part contains the Documentary Evidence of the Bidder fulfilling the Qualifying Requirements (Q.R.) stipulated in the NIT/Bid Document. The document to be submitted shall include copies of the relevant work order/ purchase order/Award letters/Agreements etc. and corresponding completion certificates issued by the concerned clients. The Bidder shall also furnish copies of the audited balance sheet and Profit and Loss Accounts for the last five financial years (w.r.t. the Bid Opening Date) in support of their meeting the Financial QR. The Bidder shall also submit all such other documents deemed necessary in support of their meeting the stipulated QR and its credentials. Further, any deviation from Technical Specification & Commercial terms shall be enclosed as per schedule 2 & 3 of Part-II. The Bidders shall submit an affidavit declaring that the bidder is a single firm and all the qualifying details are qualifications of the same firm submitting the bid.

Part-III: Commercial Bid (BOQ) & Priced Bid: This part shall contain priced Bid consisting of Bidders Technical Proposal i.e. GTP, Bid drawings etc. along with his Commercial Terms, Payment Terms in conformity with the Bid Documents. This part shall also contain prices as per the format indicated in the Bid Price Schedules 0r Bill of Quantities (BOQ) both in figures and words.

11.0 SCOPE OF THE BID

11.1 The scope of the Bid shall be on the basis of a single Bidder’s responsibility, completely covering all the equipments and their erection specified under the accompanying Technical Specifications. It will include the following:

   (i) Detailed design of the equipment.
(ii) Complete manufacture including shop testing.
(iii) Providing engineering drawing & operational manual etc.
(iv) Packing & transportation from the manufacture’s works to the site.
(v) Reliability test and performance test on completion of commissioning.
(vi) Erection, testing and commissioning of all the equipments.
(vii) Submission of specifications, test certificates of all material supplied.
(viii) All items of responsibilities, supplies and services as defined in the contract.
(ix) Operation and Maintenance, training, repair/removal/replacement of defects, of the equipments till handing over.
(x) Turn-Key responsibility as defined under this contract.

11.2 Bids containing deviations from provisions relating to the following clauses will be considered as non-responsive:

a) **Bid Guarantee**: Clause 22.0, Section INB, Part-III (Vol-1/3), Conditions of Contract.

b) **Price Basis and Payments**: Clause 13, Section INB, Part-III (Vol. 1/3), Conditions of Contract.

c) **Contract Performance Guarantee**: Clause 41.0, Section INB, Part-III (Vol. 1/3), Conditions of Contract.

d) **Liquidated damages**: Clause 14.0, Section GCC, Part-III (Vol. 1/3), Conditions of Contract.

e) **Guarantee**: Clause 15.0, Section GCC, Part - III (Vol. 1/3), Conditions of Contract.

f) **Payment**: Clause 34.0, Section GCC, Part - III (Vol. 1/3), Conditions of Contract.

Department of Power’s determination of a Bid’s responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.

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

12.0 BID PRICE

12.1 The Bidder shall quote in the appropriate Schedule of Bid Form, the prices for the entire scope of works showing the break-up shown therein (BOQ, covered under the Bidding Document) and also the unit rates of the goods and services proposed herein.

12.2 The Bidder may also furnish further price break-up to indicate the following for the purpose of convenience of assessment of Taxes & Duties as separate attachments, which shall not, however be treated as part of BOQ:-

i. Ex-works price of the equipment/materials (including tools and tackles etc.)

ii. Charges for inland transportation and insurance for delivery of the equipment/materials up to their final destinations *(i.e at site)*

iii. Lump-sum charges towards unloading, storage, insurance, erection (including insurance during construction period), testing & commissioning.

iv. Sales Tax and any other statutory levies payable on the transactions between Department of Power and the Bidder.

v. Any other charges as per the requirement of Special Conditions of Contract/Technical Specifications.
12.3 Based on their experience, capabilities and development works etc., the bidder may, in addition to base proposal, offer alternative proposal(s), for reasons of economy or better performance. But in all such cases, the base proposal shall be strictly in line with the requirements as stipulated in the Bid documents and only such base proposal shall be considered for the purpose of evaluation of proposals. Should the bid by the successful bidder contain such alternate proposal, then the owner at its discretion may accept the same at the time of award of contract.

13.0 PRICE BASIS AND PAYMENTS

13.1 The Bidders shall quote in their Proposals lump-sum price for the entire scope of works covered under the Technical Specifications as required in the tender unless otherwise specified in the Special Conditions of Contract. Bidders quoting a system of pricing other than that specified shall be rejected.

13.2 Bidder shall indicate Bid prices in Indian Rupees only.

14.0 TAXES, DUTIES and INCIDENTAL OVERHEAD

14.1 All Customs Duties, Excise Duties, Central Sales Tax, Income Tax and other statutory levies, all other overhead expenses and freight on transportation in (land, inland waters, sea, air and rail), insurance, packing, forwarding, loading, unloading, handling, storage, watch and ward, etc, payable by the contractor while procuring materials, equipments, components, sub-assemblies, raw materials, etc. for the work and transporting them to the destination shall be included in the Supply Cost (GOODS) by the bidder.

Service Tax and any other levies on services and work, all other expenses incidental to erection, testing and commissioning the work shall be included in the Erection Cost (SERVICES) by the bidder.

14.2 State Sales Tax, (known as VAT or Entry Tax) and any other statutory levies as may be imposed by the state government from time to time shall be included separately in the space provided in the BOQ for the purpose of clarity, evaluation and comparison.

14.3 Tax Deductions at Source (TDS): It will be the responsibility of the contractor to settle all the accounts of Taxes & Duties defined herein as per this contract. However, the Owner reserves the right to deduct taxes at source on statutory requirements if the contractor fails to show evidence of tax payment before final closure of the contract. TDS certificates would be issued against such deductions.

14.4 Adjustment of State Sales Tax:-

State Sales Tax (known also as VAT) paid at the time of entry in the tax gates and tax deductions at source effected by the Owner shall be adjusted with the assessed payable tax by assessing authority of the state government before closure of the contract.

15.0 LOCAL TAX OPTION

The bidder has to exercise the tax option for payment of local state sales tax available to the state of Arunachal Pradesh for work contracts (supply as well as erection contracts) as per tax rules of the state as under:-

a) 4% lump sum (known as simplified VAT or entry tax) levied flat on total bills payable. (consult tax laws of the state)

OR

b) As per item-wise VAT rates in the schedule on the invoice prices of goods supplied ex-works. (consult tax laws of the state)
16.0 TIME SCHEDULE
16.1 The basic consideration and the essence of the Contract shall be strict adherence to the
time schedule for performing the specified works.
16.2 Department of Power’s requirement of completion schedule for the Works are
mentioned in the accompanying Special Conditions of Contract.
16.3 The completion schedule as stated in the Special Conditions of Contract shall be one
of the major factors in consideration of the Bids.
16.4 Department of Power reserves the right to request for a change in the work schedule
during pre-award discussions with successful Bidder.
16.5 The successful Bidder will be required to prepare detailed PERT network and finalize
the same with Department of Power as per the requirement of Clause 12.0, Section
GCC.

17.0 CONTRACT QUALITY ASSURANCE
17.1 The Bidder shall include in his Proposal the Quality Assurance Programme containing
the overall quality management and procedures, which he proposes to follow in the
performance of the Works during various phases as detailed in relevant clause of the
General Technical Conditions.
17.2 At the time of Award of Contract, the detailed Quality Assurance Programme to be
followed for the execution of the Contract will be mutually discussed and agreed to
and such agreed Programme shall form a part of the Contract.

18.0 INSURANCE
The Bidder’s insurance liabilities pertaining to the scope of Works are detailed out in
Clauses titled ‘Insurance’ in General Terms and Conditions of Contract and in
Erection Conditions of this volume of Part-III. Bidder’s attention is specifically
invited to these clauses. Bid price shall include all the cost in pursuance of fulfilling
all the insurance liabilities under the Contract.

19.0 MAINTENANCE TOOLS AND TACKLES
The Proposal shall include all special tools and tackles required for the operation and
maintenance of the equipment in each equipment option. The Bidder shall indicate all
the above items in the Proposal sheets in the form of a schedule given therein and the
description and the quantity of each item. The lump sum price to be quoted by the
Bidder shall include prices of these tools and tackles. These tools and tackles shall be
delivered at site along with the last consignment of equipment and in no case earlier
than this, unless otherwise specified in the Special Conditions of Contract and/or

20.0 ERECTION TOOLS & TACKLES
The Bidder, under a separate schedule, in his Proposal shall include a list of all special
equipment, tools & tackles etc. which he proposes to bring to site for the purpose of
erection, handling, testing and commissioning including performance & guarantee
tests of the equipment. If any such equipment is listed anywhere else in the Proposal
and not specially mentioned in the above schedule, it shall be deemed to have been
included in the Bidder’s proposed scope of supply.
21.0 BRAND NAMES

21.1 The specific reference in these specifications and documents to any material/equipment by brand name, make or catalogue number shall be construed as establishing standards of quality and performance and not as limiting competition. However, Bidders may offer other similar material/equipment provided they meet the specified standard, design and performance requirements. The Bidder shall furnish adequate technical information about such alternative material/equipment to enable Department of Power to determine its acceptability. Department of Power shall be the sole judge on the acceptability or otherwise of such alternative material/equipment.

21.2 The Bidder shall note that standards for workmanship, material and equipment and reference to brand names or catalogue numbers designated by Department of Power in its Technical Specifications are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand name and/or catalogue numbers in its Bid, provided that it demonstrates to Department of Power’s satisfaction that the substitutions are substantially equivalent or superior to those designed in the Technical Specifications.

22.0 BID GUARANTEE

22.1 The Bidder shall furnish a Bid Guarantee of an amount mentioned in the NIT, in the form of TDR or STDR or Fixed Deposit Receipt from a recognized bank pledged to the owner as part of its Bid.

22.2 The Bid security is required to protect Department of Power against the risk of Bidder’s conduct, which would warrant the guarantee forfeiture, pursuant to 22.7 this Section. The Bid Guarantee shall be made payable to Department of Power without any condition whatsoever.

22.3 The Bid Guarantee as stated above shall be denominated in Indian Rupees and obtained from any recognized bank of India only. The recognized banks shall mean those banks which are listed in APPENDIX-II of Section INB.

22.4 Any bid not secured in accordance with paras 22.1 and 22.3 above will be rejected by Department of Power as non-responsive.

22.5 Unsuccessful Bidder’s Bid guarantee will be discharged/returned as promptly as possible but not later than 60 days after the expiration of the period of bid validity prescribed by Department of Power.

22.6 The successful Bidder’s Bid Guarantee will be discharged upon the Bidder’s executing the Contract and furnishing the Performance Guarantee pursuant to Clause 41.0 of this Section.

22.7 The bid guarantee may be forfeited:

a. If a Bidder withdraws/modifies its bid during the period of Bid validity specified by the Bidder on the Bid Form; or

b. In case the Bidder does not withdraw the modification proposed by him, if any, at the cost of withdrawal stated by him in the bid; or

c. If a Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to Clause 33.2, Section-INB of this Section; or

d. If the successful Bidder fails to sign the Contract within forty five (45) days from the date of Award; or
e. **The Bidder fails to furnish the Performance Guarantee within 30 days from the date of Notification of Award or Letter of Award.**

22.8 The Bid guarantee shall be submitted along with the bid in separate sealed envelope in one original and two copies. Any Bid not accompanied by the required Bid security in accordance with provisions of this clause will be rejected and shall not be opened.

22.9 No interest shall be payable by Department of Power on the above bid security.

**23.0 PERIOD OF VALIDITY OF BIDS**

23.1 Bids shall remain valid for 6 (six) calendar months after the date of bid opening prescribed in the NIT, unless otherwise specified in the accompanying Special Conditions of Contract. A bid valid for a shorter period will be rejected as non-responsive.

23.2 In exceptional circumstances, Department of Power may solicit the Bidder’s consent to an extension of the period of validity. The request and the response thereto shall be made in writing (including cable or telex). The bid security provided under Clause 22.0 of this Section shall also be extended by the same period as the extension in the validity of the Bid. A Bidder may refuse the request without forfeiting his Bid security. A Bidder granting the request will not be required or permitted to modify its Bid.

**D: SUBMISSION OF BIDS**

**24.0 FORMAT OF BID**

24.1 The Bidder shall prepare five copies of the Bid, clearly marking each “Original Bid” and “Copy of Bid”, as appropriate. In the event of any discrepancy between them, the original shall govern.

24.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the Contract. **The letter of authorization shall be indicated by written Power-of-Attorney accompanying the Bid.** All pages of the Bid, except for un-amended printed literature, shall be initialed by the person or persons signing the bid.

24.3 The Bidders must submit the qualifying data in five copies, as required in this instruction to Bidders in a separate envelope sealed and enclosed in the envelope submitting Proposals, super-scribed with the Name of the Project given in the NIT.

24.4 The Bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialled by the person or persons signing the Bid.

24.5 **“ORIGINAL BID” shall be submitted in the Original Bid document which was purchased from the department and shall be intact with the Original SEAL affixed by the Executive Engineer(E). Bid submitted on copies other than the original document as stated above or Bid Documents with mutilated or tempered SEAL shall be rejected.**

**25.0 SIGNATURE OF BIDS**

25.1 The Bid must contain the name, residence and place of business of the person or persons making the Bid and must be signed and sealed by the Bidder with his usual signature. The names of all persons signing should also be typed or printed below the signatures.
25.2 Bid by a partnership must be furnished with full names of all partners and be signed with the partnership name, followed by the signature(s) and designation(s) of the authorized partner(s) or other authorized representative(s).

25.3 Bids by Corporation/Company must be signed with the legal name of the Corporation/Company by the President, Managing Director or by the Secretary or other person or persons authorized to Bid on behalf of such Corporation/Company in the matter.

25.4 A Bid by a person who affixes to his signature the word ‘President’, ‘Managing Director’, ‘Secretary’, ‘Agent’ or other designation without disclosing his principal will be rejected.

25.5 Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the Bid.

25.6 The Bidder's name stated on the Proposal shall be the exact legal name of the firm.

25.7 Bids not conforming to the above requirements of signing shall be disqualified.

26.0 SEALING AND MARKING OF BIDS

26.1 The Bidders shall seal the “original” and each copy of the “Copy of Bid” separately as inner envelope and pack the “Copies” together in an outer envelope, duly marking the envelopes as “Original” and “Copy”.

26.2 The inner and outer envelopes shall be:

a. Addressed to the Executive Engineer of the Division, indicated in the cover page of this Bid document, inviting this tender.

b. and bear the name of the bid, the specification number, and the words “DO NOT OPEN BEFORE (the date of opening)” ………………….

26.3 The inner envelope shall indicate the name and address of the Bidder to enable the Bid to be returned unopened, in case it is declared “late” or “rejected”.

26.4 If the outer envelope is not sealed and marked as required by para 26.2 above, Department of Power will assume no responsibility for the bid’s misplacement or premature opening.

26.5 Premature opening shall lead to rejection of the Bid.

26.6 The Bid shall be submitted in a secured box preferably a strong steel trunk with two pad locks. The box shall be suitably and prominently labeled with Name of the Tender, full communication address of the bidder, name of the authorized representative with his contact numbers, “DO NOT OPEN BEFORE…..” and addressed to the Executive Engineer as stated above. Key set of one of the pad locks shall be handed over to Department at the time of submission. The bidder may suitably SEAL the box if so desired.

26.7 The Bidders have the option of sending the Bid by registered post or submitting the Bid in person. Bids submitted by telex/telegram will not be accepted. No request from any Bidder to collect the Proposals from airlines, cargo agents etc. shall be entertained.

26.8 The Department shall not be responsible for any kind of damage, loss or mutilation of data; damage, loss, mutilation or misplacement of documents for those bids submitted
in the mode and manner other than as prescribed in clause 26.6 above and shall be at the risk and responsibility of the Bidder.

27.0 DEADLINE FOR SUBMISSION OF BIDS

27.1 Bids must be received by Department of Power at the address specified under para 26.2 above, not later than the time & date mentioned in the Invitation to Bid.

27.2 Department of Power may, at its discretion, extend this deadline for the submission of Bids by amending the Bidding Document, in which case all rights and obligations of Department of Power and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

28.0 LATE BIDS

Any Bid received by Department of Power after the time & date fixed or extended for submission of Bids prescribed by Department of Power, will be rejected and/or returned unopened to the Bidder.

29.0 MODIFICATION AND WITHDRAWAL OF BIDS

29.1 The Bidder may modify or withdraw its bid after the Bid’s submission provided that written notice of the modification or withdrawal is received by Department of Power prior to the deadline prescribed for submission of Bids.

29.2 The Bidder’s modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions of Clause 26.0 above.

29.3 No Bid may be modified subsequent to the deadline for submission of bids.

29.4 No Bid may be withdrawn in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Bid Form. Withdrawal/modification of a Bid during this interval may result in the Bidder’s forfeiture of its bid security.

30.0 INFORMATION REQUIRED WITH THE BID

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

30.2 The above information shall be provided by the Bidder in the form of separate sheets, drawings, catalogues, etc. in five copies.

30.3 Any bid not containing sufficient descriptive material to describe accurately the equipment proposed may be treated as incomplete and hence rejected. Such descriptive materials and drawings submitted by the Bidder will be retained. Any major departure from these drawings and descriptive material submitted will not be permitted during the execution of the Contract without specific written permission of Department of Power.

30.4 Oral statements made by the Bidder at any time regarding quality, quantity or arrangement of the equipment or any other matter will not be considered.
30.5 Standard catalogue pages and other documents of the Bidder may be used in the Bid to provide additional information and data as deemed necessary by the Bidder.

30.6 The Bidder, along with his Proposal, shall submit a list of recommended erection equipment and materials which will be required for the purpose of erection of equipment and materials supplied under the Contract.

30.7 In case if the information submitted contradicts specification requirements; the specification requirements shall govern, unless otherwise brought out clearly in the technical/commercial deviation schedules 2 & 3.

E: BID OPENING AND EVALUATION

31.0 OPENING OF BIDS

31.1 First the cover containing Bid Guarantee and Bid Proposal letter (Part-I of the Bid) shall be opened and only those Bidders whose Bid contains Part-I bid as per the stipulations of the Bid Guarantee shall be considered eligible for opening of Part-II of the Bid which shall also be opened on the same day. Bidders found eligible on the basis of evaluation of the Part-II shall be invited for opening of the Part-III of the tender (Price and Techno-Commercial Bid) the date of which shall be notified by the owner to the bidders.

31.2 The Owner shall open Bids in the presence of Bidders’ representatives (up to 2 persons) who choose to attend at the date and time for opening of bids indicated in the Invitation to Bid, or in case any extension has been given thereto, on the extended bid opening date and time notified to all the Bidders, who have purchased the Bidding Documents. The Bidders’ representatives who are present shall sign a register evidencing their attendance.

31.3 The Bidders’ names, bid prices, modifications, bid withdrawals and the presence or absence of the requisite bid guarantee and such other details as the Owner, at its discretion, may consider appropriate shall be announced at the opening.

32.0 CLARIFICATION OF BIDS

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

33.0 PRELIMINARY EXAMINATION

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

33.2 Arithmetical errors will be rectified on the following basis:

If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and total price shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail. If the Bidder does not accept the correction of the errors as above, his Bid will be rejected and the amount of Bid guarantee 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 Owner 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.

33.3 Prior to the detailed evaluation, Department of Power will determine the substantial responsiveness of each bid to the Bidding Document. For purpose of this Clause, a substantially responsive bid is one, which conforms to all the terms and conditions of the Bidding Document without material deviations. A material deviation is one which limits in any substantial way, inconsistent with the bidding documents, the Owner’s rights or the bidder’s obligation under the contract or whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids and which affects in any way the prices, quality, quantity or delivery period of the equipment or which limits in any way the responsibilities or liabilities of the Bidder of any right of the Department of Power as required in these specifications and documents. Department of Power’s determination of a bid’s responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.

33.4 A bid determined as not substantially responsive will be rejected and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

33.5 Department of Power may waive any minor informality or non-conformity or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

34.0 DEFINITIONS AND MEANINGS

34.1 For the purpose of evaluation and comparison of bids, the following meanings and definitions will apply: -

a. ‘Bid Price’ shall mean the base price quoted by each Bidder in his Proposal for the complete scope of works.

b. ‘Differential Price’ shall mean the summation of the equalizing elements of price for parameter differential or deficiencies in the equipment and services determined from the Bidder’s Proposal.

c. ‘Evaluated Bid Price’ shall be the summation of ‘Bid Price’ and ‘Differential Price’.

34.2 Calculation of Differential Price:
34.2.1 The Differential Price to be added to the Bid Price of each bid during evaluation and comparison shall be derived as under:

\[
\text{Differential Price (DP)} = n_1F_1 + n_2F_2 + \ldots + n_nF_n
\]

where \(F_1, F_2, \ldots, F_n\) are the various factors in Indian Rupees per unit of parameter differential or deficiency in the equipment and services offered as stipulated in these specifications; \(n_1, n_2, \ldots, n_n\) are the respective parameter differential or deficiency in the corresponding units to be determined from the Bidder’s Proposal. The above factors and corresponding units of parameter differential are brought out in the Technical Specifications and/or Special Conditions of Contract.

35.0 COMPARISON OF BIDS

35.1 The bids shall be compared on the basis of lump-sum prices (i.e. for supply portion and prices for services to be rendered as quoted by the Bidder) for the entire scope of the Proposal as defined in the Bidding Document.

35.2 For comparison purposes all the evaluated bid prices shall be in Indian Rupees as under:

\[
W = M + DP
\]

Where,
W = Total Comparison Price  
M = Bid price in Indian Rupees (Ex-works value of equipment + Components of erection cost + mandatory spares and other components, if any).

DP = Differential price in Indian Rupees calculated according to para 34.2.1 above.

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

36.0 CONTACTING THE OWNER

Bids shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award/rejection is made by Department of Power to the Bidders. While the bids are under consideration, Bidders and/or their representatives or other interested parties are advised to refrain from contacting by any means, Department of Power and/or his employees/representatives on matters related to the bids under consideration. Department of Power, if necessary, will obtain clarifications on the bids by requesting for such information from any or all the Bidders, either in writing or through personal contacts as may be necessary. Bidders will not be permitted to change the substance of the bids after the bids have been opened.

F: AWARD OF CONTRACT

37.0 AWARD CRITERIA

37.1 Department of Power will award the Contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined as the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily. Department of Power shall be the sole judge in this regard.

37.2 In case of Supply Contract, the award shall be on the basis of FOR destination (site) basis.

37.3 Further, the Owner reserves the right to award separate Contracts to two or more parties in line with the terms and conditions specified in the accompanying Technical Specifications.

38.0 RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

Department of Power 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 Department of Power’s action.

39.0 NOTIFICATION OF AWARD

39.1 Prior to the expiration of the period of bid validity and extended validity period, if any, Department of Power will notify the successful Bidder in writing by registered letter or by cable/telex/fax, to be confirmed in writing by registered letter that its bid has been accepted.

39.2 The notification of award will constitute the formation of the Contract.
39.3 Upon the successful Bidder’s furnishing of Contract Performance Guarantee pursuant to Clause 41.0 of this Section, Department of Power will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to Clause 22.0 of this Section.

40.0 SIGNING OF CONTRACT

40.1 At the same time, as Department of Power notifies the successful Bidder that its bid has been accepted, Department of Power will send the Bidder the detailed Letter of Award (LOA), incorporating all agreements between the parties.

40.2 Within 15 days of receipt of the detailed Letter of Award, the successful Bidder shall sign and date the same and return it to Department of Power as per clause 43 of this section.

40.3 The Bidder will prepare the Contract Agreement as per the Proforma enclosed at Annexure-VIII to this volume of Part-III and the same will be signed within 45 (forty five) days of Letter of Award.

40.4 The Contractor at his own cost shall provide the Department of Power with at least 10(Ten) true copies of Contract Agreement within 15(fifteen) days after signing of the Contract.

40.5 The Contractor shall have to furnish the Contract Performance Guaranty within 30 days from the letter of award before signing the agreement.

40.6 The contractor shall strictly abide by the SCHEDULE of important events to be executed as required under this Section and given in Appendix-I of Section INB for successful and timely Signing of the Contract.

41.0 CONTRACT PERFORMANCE GUARANTEE

41.1 As the security towards the contract performance, the successful Bidder, to whom the work is awarded, shall be required to furnish a Contract Performance Guarantee (CPG) from any recognized bank in the form of Fixed Deposit Receipts, TDR or STDR pledged to the Executive Engineer (E), of the owner in the account of the bidder. The principal amount shall not be less than fifteen percent (15%) of the Contract Price and it shall guarantee the faithful performance of the Contract in accordance with the terms and conditions specified in these documents and specifications. Maturity period of the Contract Performance Guarantee shall be at-least up to 12 months from the date of project completion.

41.2 The Performance Guarantee shall cover additionally the following guarantees:

B. The successful Bidder guarantees the successful and satisfactory operation of the equipment furnished and erected under the Contract, as per the specifications and documents.

b. The successful Bidder further guarantees that the equipment provided and installed by him shall be free from all defects in design, material and workmanship and shall upon written notice from Department of Power fully remedy free of expenses such defects as developed under the normal use of the said equipment within the period of guarantee specified in the relevant clause of the General Terms and Conditions/Special Conditions of Contract in this Volume of Part-III.

41.3 The Contract Performance Guarantee is intended to secure the performance of the entire Contract. However, it is not to be construed as limiting the damages under clause entitled “Equipment Performance Guarantee” in clause 4.2 of GTC and damages stipulated in other clauses in the Bid documents.
41.4 The Performance Guarantee will be returned to the Contractor after 12 months of project completion certificate unless otherwise specified in the Special Conditions of Contract.

42.0 CORRUPT OR FRAUDULENT PRACTICES

Owner expects the bidders/suppliers/contractors observe the highest of ethics during the procurement and execution of such contracts. In pursuance of this policy, the owner,

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

   (i) “Corrupt practice” means offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution, and

   (ii) “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the owner, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the owner for free and open competition.

b. will reject a proposal for award if it determines the bidder recommended for award has engaged a corrupt or fraudulent practice in competing for the contract in question.

c. will declare a firm ineligible, either indefinitely or for a stated period of time, if owner any time determines that the firm has engaged a corrupt/fraudulent practices in competing for, or in executing the contract.

43. ACCEPTANCE OF AWARD

The successful bidder (Contractor) on receipt of the Letter of Award issued as per provisions of clause 40.0 of this section shall acknowledge the receipt of the Award in the following manner:

a. Within 15 (fifteen) days of receipt of the LOA, the bidder shall inform the owner of the acceptance of the Award as acknowledgement in writing as per ANNEXURE - IX.

b. The Contractor shall sign, seal and date all the pages of LOA and return the same to the owner along with the acceptance letter.

c. The contractor failing to do so shall be treated as non responsive and the award shall be cancelled.

APPENDICES to INB

APPENDIX-I

1. ACCEPTANCE OF LOA: Within 15 (fifteen) days of LOA Date.
2. PERFORMANCE GUARANTEE: Within 30 (Thirty) days of LOA Date before signing of the Agreement.
3. SIGNING OF AGREEMENT: Within 45 (forty five) days of LOA date.
APPENDIX-II


1. State Bank of India
2. State Bank of Bikaner
3. State Bank of Hyderabad
4. State Bank of Mysore
5. State Bank of Patiala
6. State Bank of Saurashtra
7. State Bank of Travancore
8. State Bank of Indore
9. Allahabad Bank
10. Andhra Bank
11. Bank of Baroda
12. Bank of India
13. Bank of Maharashtra
14. Canara Bank
15. Central Bank of India
16. Corporation Bank
17. Dena Bank
18. Indian Bank
19. Indian Overseas Bank
20. Oriental Bank of Commerce
21. Punjab and Sind Bank
22. Punjab National Bank
23. Syndicate Bank
24. UCO Bank
25. Union Bank of India
26. United Bank of India
27. Vijaya Bank

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SECTION – GCC
GENERAL TERMS & CONDITIONS OF CONTRACT

A. INTRODUCTION

1.0 DEFINITION OF TERMS

1.1 ‘Contract’ means the agreement entered into between the Owner and the Contractor as per the Contract Agreement signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

1.2 ‘Owner’ shall mean the Department of Power, Arunachal Pradesh and shall include its legal representatives, successors and assigns.

1.3 ‘Contractor’ or ‘Manufacturer’ shall mean the Bidder whose bid will be accepted by the Owner for the award of the Works and shall include such successful Bidder’s legal representatives, successors and permitted assigns.

1.4 ‘Sub-Contractor’ shall mean the person named in the Contract for any part of the Works or any person to whom any part of the Contract has been sublet by the Contractor with the consent in writing of the Engineer and will include the legal representatives, successors and permitted assigns of such person.

1.5 ‘Engineer’ shall mean the officer appointed in writing by the Owner to act as Engineer from time to time for the purpose of the Contract.

1.6 ‘Consulting Engineer’/ ‘Consultant’ shall mean any firm or person duly appointed as such from time to time by the Owner.

1.7 The terms ‘Equipment’, ‘Stores’ and ‘Materials’ shall mean and include equipment, stores and materials to be provided by the Contractor under the Contract.

1.8 ‘Works’ shall mean and include the furnishing of equipment, labour and services, as per the Specifications and complete erection, testing and putting into satisfactory operation including all transportation, handling, unloading and storage at the Site as defined in the Contract.

1.9 ‘Specifications’ shall mean the Specifications and Bidding Document forming a part of the Contract and such other schedules and drawings as may be mutually agreed upon.

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

1.11 The term ‘Contract Price’ shall mean the lump-sum price quoted by the Contractor in his bid with additions and/or deletions as may be agreed and incorporated in the Letter of Award, for the entire scope of the works.

1.12 The term ‘Equipment Portion’ of the Contract price shall mean the ex-works value of the equipment.

1.13 The term ‘Erection Portion’ of the Contract price shall mean the value of field activities of the works including erection, testing and putting into satisfactory operation including successful completion of performance and guarantee tests to be performed at Site by the Contractor including cost of insurances.
1.14 ‘Manufacturer’s Works’ or ‘Contractor’s Works’, shall mean the place of work used by the manufacturer, the Contractor, their collaborators/associates or Sub-Contractors for the performance of the Contract.

1.15 ‘Inspector’ shall mean the Owner or any person nominated by the Owner from time to time, to inspect the equipment; stores or Works under the Contract and/or the duly authorized representative of the Owner.

1.16 ‘Notice of Award of Contract’/’Letter of Award’/’Telex of Award’ shall mean the official notice issued by the Owner notifying the Contractor that his bid has been accepted.

1.17 ‘Date of Contract’ shall mean the date on which Notice of Award of Contract/Letter of Award has been issued.

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

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

1.20 When the words ‘Approved’, ‘Subject to Approval’, ‘Satisfactory’, ‘Equal to’, ‘Proper’, ‘Requested’, ‘As Directed’, ‘Where Directed’, ‘When Directed’, ‘Determined by’, ‘Accepted’, ‘Permitted’, or words and phrases of like importance are used the approval, judgment, direction etc. is understood to be a function of the Owner/Engineer.

1.21 ‘Test on completion’ shall mean such tests as prescribed in the Contract to be performed by the Contractor before the work is taken over by the Owner.

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

1.23 ‘Initial Operation’ shall mean the first integral operation of the complete equipment covered under the contract with the sub-systems and supporting equipments in service or available for service.

1.24 ‘Operation’ shall mean the integral operation of the complete equipment covered under the Contract with the sub-system and supporting equipment in service or available for service. The length of operation shall be as determined by the Engineer, unless otherwise specified elsewhere in the Contract.

1.25 ‘Performance and Guarantee Tests’, shall mean all operational checks and tests required to determine and demonstrate capacity, efficiency, and operating characteristics as specified in the Contract Documents.

1.26 The term ‘Final Acceptance’/‘Taking Over’ shall mean the Owner’s written acceptance of the Works performed under the Contract, after successful commissioning/completion of Performance and Guarantee Tests, as specified in the accompanying Technical Specifications or otherwise agreed in the Contract.

1.27 ‘Commercial Operation’ shall mean the condition of operation in which the complete equipment covered under the Contract is officially declared by the Employer to be available for continuous operation at different loads up to and
including rated capacity. Such declaration by the Owner, however, shall not relieve or prejudice the Contractor of any of his obligations under the Contract.

1.28 ‘Guarantee Period’/‘Maintenance Period’ shall mean the period during which the Contractor shall remain liable for repair or replacement of any defective part of the works performed under the Contract.

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

1.30 ‘Drawing’, ‘Plans’, shall mean all:

   a) Drawings furnished by the Owner/Consultant as a basis of Bid/Proposals.
   b) Supplementary drawings furnished by the Owner/Consultant to clarify and to define in greater detail the intent of the Contract.
   c) Drawings submitted by the Contractor with his bid provided such drawings are acceptable to the Owner/Consultant.
   d) Drawings furnished by the Owner/Consultant to the Contractor during the progress of the work; and
   e) Engineering data and drawings submitted by the Contractor during the progress of the work provided such drawings are acceptable to the Engineer/Owner.

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

   a) Indian Electricity Act, 1910 and Rules and Regulations made there under.
   b) Indian Factory Act, 1948 and Rules and Regulations made there under.
   c) Indian Explosives Act, 1884 and Rules and Regulations made there under.
   d) Indian Petroleum Act, 1934 and Rules and Regulations made there under.
   e) Indian Electricity Act, 2003 and Rules and Regulations made there under.
   f) A.S.M.E. Test Codes.
   g) A.I.E.E. Test Codes.
   h) American Society of Materials Testing Codes.
   i) Standards of the Indian Standards Institution.
   j) Other Internationally approved standards and/or rules and regulations touching the subject matter of the Contract.

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

1.33 Words imparting ‘Person’ shall include firms, companies, corporations and associations or bodies of individuals, whether incorporated or not.

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

The various Acts and Regulations are normally available for sale from the following addresses or with leading authorized Government of Indian Book – Sellers:
1.35 In addition to the above the following definitions shall also apply:

a) ‘All equipment and materials’ to be supplied shall also mean ‘Goods’.

b) ‘Constructed’ shall also mean ‘erected and installed’.


d) “Bid Guarantee” shall also means “Earnest money” or “Bid security”

2.0 APPLICATION

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

3.0 STANDARDS

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

4.0 LANGUAGE AND MEASURES

All documents pertaining to the Contract including specifications, schedules, notices, correspondences, operating and maintenance instructions, drawings or any other writing shall be written in English language. The Metric System of measurement shall be used exclusively in the Contract.

5.0 CONTRACT DOCUMENTS

5.1 The term Contract Documents shall mean and include the following, which shall be deemed to form an integral part of the Contract:

a) Invitation to Bid including letter forwarding the Bidding Documents, Instructions to Bidders, General Terms & Conditions of Contract, Special Conditions of Contract and all other documents included under Part-I, Part-II and Part-III of the Bid document.

b) Specifications of the equipment to be furnished and erected under the Contract as brought out in the accompanying Technical Specifications in Part-III (Vol. 3/3).

c) Contractor’s Bid Proposal and the documents attached thereto including the letters of clarifications thereto between the Contractor and the Owner/Consultant prior to the Award of Contract except to the extent of repugnancy.
d) All the materials, literature, data and information of any sort given by the Contractor along with his Bid, subject to the approval of the Owner/Consultant.

e) Letter of Award and any agreed variations of the conditions of the documents and special terms and conditions of Contract, if any.

5.2 In the event of any conflict between the above-mentioned documents, the matter shall be referred to the Engineer whose decision shall be considered as final and binding upon the parties.

6.0 USE OF CONTRACT DOCUMENTS AND INFORMATION

6.1 The Contractor shall not, without the Owner’s prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Owner in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only as far as it may be necessary for the purpose of such performance.

6.2 The Contractor shall not, without the Owner’s prior written consent, make use of any document or information enumerated in various Contract documents except for the purpose of performing the Contract.

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

6.4 Any document, other than the Contract itself, enumerated in various Contract documents shall remain the property of the Employer and shall be returned (in all copies) to the Owner on completion of the Contractor’s performance under the Contract if so required by the Owner.

7.0 CONSTRUCTION OF THE CONTRACT

7.1 Notwithstanding anything stated elsewhere in the Bid documents, the Contract to be entered into will be a single Contract on TURNKEY BASIS having elements of Supply and Erection as divisible Components within the Contract.

Award shall be placed on the successful Bidder on TURNKEY BASIS as a “Single Contract” for Supply and Erection having the following elements as distinct components:

i) For Ex-Works Supply of all equipment and materials.

ii) For Erection of all supplied equipments and materials including storage, handling at site, installation, testing and commissioning, providing all other services like inland transportation, insurance for delivery at site, unloading, performance testing in respect of all the equipment supplied under the “Contract” and any other services specified in the Bid Documents.

iii) For other provisions like levies, taxes and duties etc admissible as per clause 14 & 15 of Section INB read with clause 16 below(GCC) and clause 5.1.2 of SCC.
iv) All these Components shall be severely interlinked and shall have cross-fall breach clause specifying that failure on the part of bidder in one or more Components of contract will constitute breach of the entire Contract.

7.2 In case, where the Owner hands over his equipment to the Contractor for executing the contract, then the Contractor shall at the time of taking delivery of the equipment/dispatch documents be required to execute an Indemnity Bond in favour of the Owner in the form acceptable to the Owner 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 Indemnity Bond are enclosed as Annexure – VI & VII to this Part-III.

7.3 The Contract shall in all respect be construed and governed according to Indian Laws.

7.4 It is clearly understood that the total consideration for the Contract(s) has been broken up into various components only for the convenience of payment of advance under the Contract(s) and for the measurement of deviations or modifications under the Contract(s).

7.5 TURNKEY concept shall mean execution of contract from concept to successful commissioning and operation of the project which shall comprise of Survey, Investigation and Design, efficient planning and project management, quality control, supply, erection, construction, supervision, monitoring and overseeing of the performance and operation of the project and handing over the project as a successful product of the Contract at the time of Closing the contract.

8.0 JURISDICTION OF CONTRACT

The laws applicable to the Contract shall be the laws in force in India. The Permanent Bench of The Guwahati High Court at Naharlagun of Arunachal Pradesh shall have exclusive jurisdiction in all matters arising under this Contract.

9.0 MANNER OF EXECUTION OF CONTRACT

9.1 The Owner, after the issue of the Letter of Award to the Contractor, will send one copy of the final agreement to the Contractor for his scrutiny and approval.

9.2 The Agreement, unless otherwise agreed to, shall be signed within 45 (forty five) days of the acceptance of the Letter of Award, at the office of the Owner on a date and time to be mutually agreed. The Contractor shall provide for signing of the Contract, Performance Guarantee in six copies, appropriate power of attorney and other requisite materials. In case the Contract is to be signed beyond the stipulated time, the Bid Guarantee submitted with the Proposal will have to be extended accordingly.

9.3 The Agreement will be signed in six originals and the Contractor shall be provided with one signed original and the rest will be retained by the Owner.

9.4 The Contractor shall provide free of cost to the Owner all the Engineering data, drawings, and descriptive materials submitted with the bid, in at least six (6) copies to form a part of the Contract immediately after issue of Letter of Award

9.5 Subsequent to signing of the Contract, the Contractor at his own cost shall provide the Owner with at least ten (10) ten true copies of agreement within thirty (30) days after the signing of the Contract.
10.0 ENFORCEMENT OF TERMS

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

11.0 CLOSURE OF CONTRACT

11.1 Unless otherwise terminated pre-maturely or closed normally under the provisions of relevant clauses herein, this Contract shall be deemed to be in force for a period of 90 days of the date release of the Contract Performance Guarantee or Contract Closure Certificate as per Clause 19 of SCC by the owner, which ever is later.

11.2 Project completion shall mean completion of all supplies, erection, testing, commissioning and taking over of the entire project as a finished product as envisaged in the turnkey contract. It shall not be synonymous with contract completion which is link with other contractual obligations.

B. GUARANTEES & LIABILITIES

12.0 TIME – THE ESSENCE OF CONTRACT

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

12.2 The Contractor shall submit a detailed PERT network/bar chart within the time frame agreed consisting of adequate number of activities covering various key phases of the work such as design, procurement, manufacturing, shipment and field erection activities within fifteen (15) days of the date of Notification of Award. This network shall also indicate the interface facilities to be provided by the Owner and the dates by which such facilities are needed. The Contractor shall discuss the network so submitted with the Owner and the agreed network shall form part of the Contract documents. As provided in the clause of Terms of Payment in this Section, finalization of the network/bar charts will be precondition to release of any initial advance to the Contractor. During the performance of the Contract, if in the opinion of the Engineer, proper progress is not maintained, suitable changes shall be made in the Contractor’s operations to ensure proper progress without any cost implication to the Owner. The interface facilities to be provided by the Owner in accordance with the agreed network shall also be reviewed while reviewing the progress of the Contractor.

12.3 Based on the above-agreed network/bar chart fortnightly reports shall be submitted by the Contractor as directed by the Engineer.

12.4 Subsequent to the finalization of the network, the Contractor shall make available to the Engineer a detailed manufacturing programme in line with the agreed Contract network. Such manufacturing programme shall be
reviewed, updated and submitted to the Engineer once every two months thereafter.

12.5 The above bar charts/manufacturing programme shall be compatible with the Owner’s computer environment and furnished to the Owner on such media as may be desired by the Owner.

13.0 EFFECTIVENESS OF CONTRACT

The Contract shall be considered as having come into force from the date of the notification of award unless otherwise provided in the notification of award.

14.0 LIQUIDATED DAMAGES

14.1 For Equipment Portion

14.1.1 If the Contractor fails to successfully complete the commissioning within the time fixed under the Contract, the Contractor shall pay to the Owner as liquidated damages and not as penalty a sum specified for each specified period of delay. The details of such liquidated damages are brought out in the accompanying Special Conditions of Contract, clause 8.

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

14.1.3 Total amount of liquidated damages for delay under the Contract will be subject to a maximum of 10% of the Contract Price.

14.2 Liquidated damages for not meeting performance guarantee during the performance and guarantee tests shall be assessed and recovered from the Contractor as detailed in Technical Specifications/Special Conditions of Contract. Such liquidated damages shall be without any limitation whatsoever and shall be in addition to damages, if any, payable under any other clause of Conditions of Contract.

15.0 GUARANTEE

15.1 The Contractor shall warrant that the equipment will be new, unused and in accordance with the Contract documents and free from defects in material and workmanship for a period of twelve (12) calendar months commencing immediately upon the satisfactory commissioning. The Contractor’s liability shall be limited to the replacement of any defective parts in the equipment of his own manufacture or those of his Sub-Contractors under normal use and arising solely from faulty design, materials and/or workmanship provided always that such defective parts are repairable at the site and are not in meantime essential in the commercial use of the equipment. Such replaced/defective parts shall be returned to the Contractor unless otherwise arranged. No repairs or replacement shall normally be carried out by the Engineer when the equipment is under the supervision of the Contractor’s supervisory Engineer.

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

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

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

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

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

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

15.8 At the end of the guarantee period, the Contractor’s liability ceases except for latent defects. For latent defects, the Contractor’s liability as mentioned in Clauses 15.1 through 15.7 above shall remain till the end of 5 years from the date of completion of guarantee period. In respect of goods supplied by Sub-Contractors to the Contractor, where a longer guarantee (more than 12 months) is provided by such Sub-Contractor, the Owner shall be entitled to the benefits of such longer guarantee.

15.9 The provisions contained in this clause will not be applicable:
   a) If the Owner has not used the equipment according to generally approved industrial practice and in accordance with the conditions of operations specified and in accordance with operating manuals, if any.
   b) In cases of normal wear and tear of the parts to be specifically mentioned by the Contractor in the offer.

16.0 TAXES, PERMITS & LICENCES

The Contractor shall be liable and pay all non-Indian taxes, duties, levies lawfully assessed against the Owner or the Contractor in pursuance of the Contract. In addition, the Contractor shall be responsible for payment of all Indian duties, levies and taxes lawfully assessed against the Contractor for his personal income & property only. This clause shall be read in conjunction with Clause 14 & 15 of Section INB, Clause 5.1.2 of SCC of this volume of Part-III.

17.0 REPLACEMENT OF DEFECTIVE PARTS AND MATERIALS

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

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

18.0 PATENT RIGHTS AND ROYALTIES
Royalties and fees for patents covering materials, articles, apparatus, devices, equipment or processes used in the works shall be deemed to have been included in the Contract Price. The Contractor shall satisfy all demands that may be made at any time for such royalties or fees and he alone shall be liable for any damages or claims for patent infringements and shall keep the Owner indemnified in that regard. The Contractor shall, at his own cost and expense, defend all suits or proceedings that may be instituted for alleged infringement of any patents involved in the Works, and, in case of an award of damages, the Contractor shall pay for such award. In the event of any suit or other proceedings instituted against the Owner, the same shall be defended at the cost and expense of the Contractor who shall also satisfy/comply with any decree, order or award made against the Owner. But it shall be understood that no such machine, plant, work, material or thing has been used by the Owner for any purpose or any manner other than that for which they have been furnished and installed by the Contractor and specified under these specifications. Final payment to the Contractor by the Owner will not be made while any such suit or claim remains unsettled. In the event any apparatus or equipment, or any part thereof furnished by the Contractor, is in such suit or proceedings held to constitute infringement, and its use is enjoined, the Contractor shall at his option and at his own expense, either procure for the Owner, the right to continue the use of said apparatus, equipment or part thereof, replace it with non-infringing apparatus or equipment or modify it, so it becomes non-infringing.

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

20.0 **LIMITATION OF LIABILITIES**

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

21.0 **ENGINEER’S DECISION**

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

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

21.3 The Engineer’s decision and the filing of the written objection thereto shall be a condition precedent to the right to request arbitration. It is the intent of the Agreement that there shall be no delay in the execution of the works and the decision of the Engineer as rendered shall be promptly observed.

22.0 **POWER TO DEVIATE, VARY OR OMIT WORK**

22.1 No alterations, amendments, omissions, suspensions or deviations of the Works (hereinafter referred to as ‘deviation’) under the Contract as detailed in the Contract Documents, shall be made by the Contractor except as directed in writing by the Engineer, but the Engineer shall have full powers subject to the provisions hereinafter contained, from time to time during the execution of the Contract, by notice in writing to instruct the Contractor to make such deviation without prejudice to the Contract. The Contractor shall carry out such deviation and be bound by the same conditions as far as applicable as though the said deviations occurred in the Contract Documents. If any suggested deviations would, in the opinion of the Contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the Contract, he shall notify the Engineer thereof in writing and the Engineer shall decide forthwith whether or not, the same shall be carried out and if the Engineer confirms his instructions, the Contractor’s obligations and guarantees shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such deviation shall be added to or deducted from the Contract Price as the case may be.

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

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

22.4 If any deviation in the Works results in reduction of Contract Price, the parties shall agree, in writing, so to the extent of any change in the price, before the Contractor proceeds with the change.

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

22.6 Notwithstanding anything stated above in this clause, the Engineer shall have the full power to instruct the Contractor, in writing, during the execution of the Contract to vary the quantities of the items or groups of items in accordance with the provisions of clause entitled ‘Change of Quantity’ in section GCC of this volume of Part-III. The Contractor shall carry out such deviations and be bound by the same conditions as though the said deviations occurred in the Contract Documents. However, the Contract Price shall be adjusted at the rates and the prices provided for the original quantities in the Contract.

23.0 ASSIGNMENT, SUB-LETTING AND SUB-CONTRACT

23.1 The Contractor may sub-let or sub-contract any parts or portions of the works after prior written approval of the owner. The contractor shall not assign the entire contract through execution of Power of Attorney or any other legal means which releases him of his responsibility in this contract. Such acts of the contractor shall be treated as fraudulent behavior of the contractor and action shall be initiated for forfeiture of the securities as per contract and as per any other relevant law as may be appropriate.

23.2 Suppliers of materials and equipments shall be any of the approved vendors listed in this contract or as may be approved by the Owner. Any change in the approved suppliers shall be subjected to fresh approvals of the Owner.

23.3 This arrangement of approvals of sub-contractors and vendors shall not relieve the Contractor of any obligation, duty or responsibility under the Contract. The owner shall not be a party whatsoever to any sub-contract agreements so allowed by the owner.

23.4 For components/equipment procured by the Contractor for the purposes of the Contract, after obtaining the written approval of the Employer, the Contractor’s purchase specifications and enquiries shall call for quality plan to be submitted by the suppliers along with their Bids. The quality plans called for from the Vendors shall set out, during the various stages of manufacture and installation, the quality practices and procedures followed by the Vendors’ quality control organization, the relevant reference document/standard used, acceptance level, inspection documentation raised, etc. Such quality plans of the successful vendors shall be discussed and finalized in consultation with the Engineer and shall form a part of the Purchase Order/Contract between the Contractor and
the Vendor. Within three weeks of the release of the Purchase Orders/Contracts for such bought out items/components a copy of the same without price details but together with detailed purchase specifications, quality plans and delivery conditions shall be furnished to the Engineer by the Contractor.

23.5 The Contractor shall not require any approval from the Employer for:

a. the provision for labour, consultants, designers and any services as may be required for the work.

b. the purchase of materials which are in accordance with the standards specified in the Contract from approved vendors.

c. purchase of machineries and equipment for carrying out the contract.

24.0 CHANGE OF QUANTITY

24.1 During the execution of the Contract, the Owner reserves the right to increase or decrease the quantities of items as per actual project requirement under the Contract but without any change in unit price.

24.2 The Contract price shall accordingly be adjusted based on the unit rates available in the Contract for the change in quantities as above. The base unit rates, as identified in the Contract shall however remain constant during the currency of the Contract, except as provided for in Clause 33.0 below.

25.0 PACKING, FORWARDING AND SHIPMENT

25.1 The Contractor, wherever applicable, shall after proper painting, pack and crate all equipment in such a manner as to protect them from deterioration and damage during rail and road transportation to the Site and storage at the site till the time of erection. The Contractor shall be held responsible for all damages due to improper packing.

25.2 The Contractor shall notify the Owner of the date of each shipment from his works, and the expected date of arrival at the Site for the information of the Owner.

25.3 The Contractor shall also give all shipping information concerning the weight, size and content of each packing including any other information the Owner may require.

25.4 The following documents shall be sent by registered post to the Owner within three days from the date of shipment, to enable the Owner to make progressive payments to the Contractor:

Application for payment in the standard format of the Owner (3 copies)
Invoice (6 copies)
Packing list (6 copies)
Pre-dispatch clearance certificate, if any (3 copies)
Test Certificate, wherever applicable (3 copies)
Insurance Certificate (3 copies)

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

26.0 COOPERATION WITH OTHER CONTRACTORS & CONSULTING ENGINEERS

The Contractor shall agree to cooperate with the Owner’s other Contractors and Consulting Engineers and freely exchange with them such technical information as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of efforts. The Engineer shall be provided with three copies of all correspondence addressed by the Contractor to other Contractors and Consulting Engineers of the Owner in respect of such exchange of technical information.

27.0 NO WAIVER OF RIGHTS

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

28.0 CERTIFICATE NOT TO AFFECT RIGHT OF OWNER AND LIABILITY OF THE CONTRACTOR.

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

29.0 TRAINING OF OWNER'S PERSONNEL

29.1 The Contractor shall undertake to train free of cost, Engineering personnel selected and sent by the Owner at the works of the Contractor unless otherwise specified in the Technical Specifications. The period and the nature of training for the individual personnel shall be agreed upon mutually between the Contractor and the Owner. These Engineering personnel shall be given special training in the shops, where the equipment will be manufactured and/or in their Collaborator’s works and where possible, in any other plant where equipment manufactured by the Contractor or his collaborator is under installation, operation, or testing to enable those personnel to become familiar with the equipment being furnished by the Contractor. The details of the number of persons to be trained, period of training, nature of training etc. shall be as
outlined in accompanying Technical Specifications/Special Conditions of Contract.

29.2 All traveling and living expenses for the Engineering personnel to be trained during the total period of training will be borne by the Owner. These Engineering personnel, while undergoing training, shall be responsible to the Contractor for discipline.

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

30.0 PROGRESS REPORTS AND PHOTOGRAPHS

During the various stages of the work in pursuance of the Contract, the Contractor shall at his own cost submit periodic progress reports as may be reasonably required by the Engineer with such materials as, charts, net-works, photographs, test certificates, etc. Such progress reports shall be in the form and size as may be required by the Engineer and shall be submitted in at least three (3) copies.

31.0 TAKING-OVER

Upon successful commissioning of the work the Engineer shall issue to the Contractor a Taking-over Certificate as a proof of the final acceptance of the equipment. Such certificate shall not unreasonably be withheld nor will the Engineer delay the issuance thereof on account of minor omissions or defects, which do not affect the commercial operation and/or cause any serious risk to the equipment. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of the Contract after issue of such certificate.

C. CONTRACT SECURITY AND PAYMENTS

32.0 CONTRACT PERFORMANCE GUARANTEE

The Contractor shall furnish Contract Performance Guarantee(s) as a security for the proper fulfillment of the Contract in the prescribed format within thirty (30) days of “Notice of Award of Contract”. The performance guarantee(s) shall be as per terms prescribed in Clause 41 of Section INB.

33.0 CONTRACT PRICE ADJUSTMENT: All the prices in this contract shall be **FIRM** till the closure of this contract. (Price Variation Clause or Price Adjustment due to price rise/fall is NOT APPLICABLE IN THIS CONTRACT)

34.0 PAYMENT

34.1 The payment to the Contractor for the performance of the works under the Contract will be made by the Owner as per the guidelines and conditions specified herein. All payments made during the Contract shall be on account as interim payments only. The final payment will be made on completion of all Works and on fulfillment by the Contractor of all his liabilities under the Contract.

34.2 Currency of Payment

All payments under the Contract shall be in Indian Rupees only.

34.3 Due Dates for Payments
The initial advance amount shall be payable after fulfilment of all the conditions laid down in the General Terms and Conditions of Contract, Clause 34.7.1 below and receipt of the Contractor’s invoice along with all necessary supporting documents for such advance payment. The price component of the initial advance amount will become due for payment within thirty (30) days of receipt of the Contractor’s invoice. The Owner will make progressive payment as and when the payment is due as per the terms of payment set forth in the accompanying Special Conditions of Contract. Progressive payments other than those under the letter of credit will become due and payable by the Owner within thirty (30) days of the date of receipt of Contractor’s bill/invoice/debit note by the Owner provided the documents submitted are complete in all respects.

34.4 **Payment Schedule**

The Contractor shall prepare and submit to the Engineer for approval, a break up of the Contract Price. This Contract Price break-up shall be interlinked with the agreed detailed PERT network of the Contractor setting forth his starting and completion dates for the various key phases of Works prepared as per conditions in Clause 12.0 of this Section GCC of Part-III (Vol. 1/3). Any payment under the Contract shall be made only after the Contractor’s price break up is approved by the Engineer. The aggregate sum of the Contractor’s price break up shall be equal to the lump sum Contract Price. A price break-up over valuing those items of supply, which will be shipped first will not be accepted.

34.5 **Application for Payment**

34.5.1 The Contractor shall submit application for the payment in the prescribed proforma of the Owner. Proforma for application for payment is enclosed as **Annexure-IV** of Part-III (Vol. 1/3).

34.5.2 Each such application shall state the amount claimed and shall set forth in detail, in the order of the Payment Schedule, particulars of the Works including the Works executed at Site and of the equipment shipped/brought on to the site pursuant to the Contract up to the date mentioned in the application and for the period covered since the last preceding certificate, if any.

34.5.3 Every interim payment certificate shall certify the Contract value of the Works executed up to the date mentioned in the application for the payment certificate, provided that no sum shall be included in any interim payment certificate in respect of the works that, according to the decision of the Engineer, does not comply with the Contract or has been performed, at the date of certificate prematurely.

34.6 **Mode of Payment**

34.6.1 Payment due on dispatch of equipment shall be made by the Owner through the Owner’s Bank or directly to the Contractor as per the payment schedule.

34.6.2 **The payment of the advance**, test charges, if any, price adjustment, any other supply payment, taxes and duties (whenever admissible) inland transportation (including port handling), insurance and the erection portion of the Works shall be made direct to the Contractor by the Owner.

34.7 **Terms Of Payment**
Nothing shall be payable to the Contractor for the performance of this contract unless the conditions lay hereunder and the all other conditions of this contract are fulfilled except the special conditions provided in SCC.

34.7.1 ADVANCE AND INTERIM PAYMENTS

No advance payment shall be made under this contract except as provided hereunder:-

a) An option for advance payment of up to a maximum of 15% (fifteen percent) of the contract price can be availed subject to the conditions specified hereunder and against submission of a Security Against Mobilization Advance(SAMA) in the form of Fixed Deposit Receipt (FDR or STDR) of principal amount not lesser than the advance amount issued by any Nationalized Bank pledged in favour of the Executive Engineer in charge of the project.

i. The contractor has already entered into an agreement under this contract.

ii. Submission of Contract Performance Guarantee in accordance with clause 41.0 of Section INB of Part-III (Vol. 1/3).

iii. Submission of a detailed PERT network/bar chart based on the work schedule stipulated in the Letter of Award and its approval by the Owner.

b) Interim Payments (IP) shall be payable on claims made against works done as per the following formula:

\[
\text{IP} = 0.90 \times (0.80 \times \text{MS} + 0.20 \times \text{ME} + \text{EC} + \text{OS}) - \text{DAS}
\]

Where

\text{IP} = \text{Interim Payment eligible}

\text{MS} = \text{Cost of cumulative quantities of Materials Supplied including the quantities erected or cost of Goods supplied.}

\text{ME} = \text{Cost of cumulative quantities of Materials Erected (excluding the cost of materials supplied but not erected) or cost of Goods erected.}

\text{EC} = \text{Cumulative Erection Cost of materials or Goods erected.}

\text{OS} = \text{Cumulative cost of Other Services or items of work on full rate (supply \& erection rate not segregated.}

\text{DAS} = \text{Any levies or recoveries to be Deducted At Source as may be applicable by law and under this contract.}

c) The contractor shall be eligible for final payment of the balance dues against the contract only on the claim of last and final bill to be submitted to the owner with a request for project completion certificate as defined in clause 11.2 of Section GCC.

d) Advance payment can be adjusted only in one go from any one of the bills on the wish of the contractor enabling the owner to release the security instrument in the form of FDR/STDR. If the contractor does not exercise this option, the owner shall release it at the time of final payment after adjusting the advance paid.

e) Interim payments made, any other recoveries, deductions and adjustments, as may be required under this contract shall be effected before closure of the contract and release of the securities.
34.7.2 All further payments under the Contract shall be made as stipulated in the Special Conditions of Contract after signing the Contract Agreement. The payments linked with the dispatch of materials shall only be made after production of all dispatch documents as specified in L/C conditions and/or in the relevant Contract conditions which will inter-alia include the Material Inspection Clearance Certificate (MICC) issued by the Owner’s Corporate QA&I representatives.

34.7.3 Progressive payments linked with erection shall only be made after the issue of certificates by the Engineer, one for the quantum of work completed and the other by the Engineer’s Field Qualify surveillance representative for the successful completion of quality check points involved in the quantum of work billed.

34.8 Inland Transportation & Insurance

Inland transportation (including port handling) and inland insurance charges shall be paid to the Contractor on pro-rata to the value of the equipment received at site and on production of the invoices by the Contractor. However, wherever equipment wise inland transportation charges have been called for in the ‘Bid Proposal Sheets’ and have been furnished by the Contractor, the payment of inland transportation charges shall be made after receipt of equipment at site based on the charges thus identified by the Contractor in his Proposal and incorporated in the Contract. The aggregate of all such pro-rata payments shall however not exceeds the total amount quoted by the Bidder in his Bid and incorporated in the Contract.

35.0 DEDUCTIONS FROM CONTRACT PRICE

All costs, damages or expenses that the Owner may have paid, for which under the Contract the Contractor is liable to bear, shall be deducted or adjusted either from payable dues or from the securities held by the owner or may be recovered by legal means under appropriate law in force.

D. RISK DISTRIBUTION

36.0 TRANSFER OF TITLE

36.1 Transfer of title in respect of equipment and materials supplied by the Contractor to the Owner pursuant to the terms of the Contract shall pass on to the Owner with negotiation of dispatch documents.

36.2 This Transfer of Title shall not be construed to mean the acceptance and the consequent “Taking Over” of equipment and materials. The Contractor shall continue to be responsible for the quality and performance of such equipment and materials and for their compliance with the specifications until “Taking Over” and the fulfillment of guarantee provisions of this Contract.

36.3 This Transfer of Title shall not relieve the Contractor from the responsibility for all risks of loss or damage to the equipment and materials as specified under the clause entitled “Insurance” of this Section.

37.0 INSURANCE

37.1 The Contractor at his cost shall arrange, secure and maintain all insurance as may be pertinent to the Works and obligatory in terms of law to protect his
interest and interests of the Owner against all perils detailed herein. The form and the limit of such insurance as defined herein together with the under-writer in each case shall be acceptable to the Owner. However, irrespective of such acceptance, the responsibility to maintain adequate insurance coverage at all time during the period of Contract shall be of Contractor alone. The Contractor’s failure in this regard shall not relieve him of any of his contractual responsibilities and obligations. The insurance covers to be taken by the Contractor shall be in the joint name of the Owner and the Contractor. The Contractor shall, however, be authorized to deal directly with Insurance Company or Companies and shall be responsible in regard to maintenance of all insurance covers. Further the insurance should be in freely convertible currency.

37.2 Any loss or damage to the equipment during handling, transportation, storage, erection, putting into satisfactory operation and all activities to be performed till the successful completion of commissioning of the equipment shall be to the account of the Contractor. The Contractor shall be responsible for preference of all claims and make good the damages or loss by way of repairs and/or replacement of the equipment, damaged or lost. The transfer of title shall not in any way relieve the Contractor of the above responsibilities during the period of Contract. The Contractor shall provide the Owner with copies of all insurance policies and documents taken out by him in pursuance of the Contract. Such copies of documents shall be submitted to the Owner immediately after such insurance coverage. The Contractor shall also inform the Owner in writing at least sixty (60) days in advance regarding the expiry/cancellation and/or change in any of such documents and ensure revalidation, renewal etc., as may be necessary well in time.

37.3 The perils required to be covered under the insurance shall include, but not be limited to fire and allied risks, miscellaneous accidents (erection risks) workman compensation risks, loss or damage in transit, theft, pilferage, riot and strikes and malicious damages, civil commotion, weather conditions, accidents of all kinds, etc. The scope of such insurance shall be adequate to cover the replacement/reinstatement cost of the equipment for all risks up to and including delivery of goods and other costs till the equipment is delivered at Site. The insurance policies to be taken should be on replacement value basis and/or incorporating escalation clause. Notwithstanding the extent of insurance cover and the amount of claim available from the underwriters, the Contractor shall be liable to make good the full replacement/rectification value of all equipment/materials and to ensure their availability as per project requirements.

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

37.5 The clause 28 entitled ‘Insurance’ under the Section ECC of this Part-III (Vol. 1/3) covers the additional insurance requirements for the portion of the works to be performed at the Site.

38.0 LIABILITY FOR ACCIDENTS AND DAMAGES
Under the Contract, the Contractor shall be responsible for loss or damage to the plant until the successful completion of commissioning as defined elsewhere in the Bid document.

39.0 DELAYS BY EMPLOYER OR HIS AUTHORISED AGENTS

39.1 In case the Contractor’s performance is delayed due to any act of omission on the part of the Owner or his authorized agents, then the Contractor shall be given due extension of time for the completion of the Works, to the extent such omission on the part of the Owner has caused delay in the Contractor’s performance of the Contract.

39.2 In addition, the Contractor shall be entitled to claim demonstrable and reasonable compensation if such delays have resulted in any increase in cost. The Owner shall examine the justification for such a request for claim and if satisfied, the extent of compensation shall be mutually agreed depending upon the circumstances at the time of such an occurrence.

Regarding reasonableness or otherwise of the extension of time, the decision of the Engineer shall be final.

40.0 DEMURRAGE, WHARFAGE, ETC.

All demurrage, wharfage and other expenses incurred due to delayed clearance of the material or any other reason shall be to the account of the Contractor.

41.0 FORCE MAJEURE

41.1 ‘Force Majeure’ is herein defined as any cause which is beyond the control of the Contractor or the Owner as the case may be, which neither party could foresee with a reasonable amount of diligence; which substantially affects the performance of the Contract, such as:

a. Natural phenomena, including but not limited to fire, landslides, floods, droughts, earthquakes and epidemics;

b. Acts of any Government, domestic or foreign, limited to war, restrictions by fresh enactment of law and fresh embargo or ban by statutory orders of executive or judiciary.

Provided either party shall within fifteen (15) days from the occurrence of such a cause notify the other in writing of such causes.

41.2 The Contractor or the Owner shall not be liable for delays in performing his obligations resulting from any Force Majeure cause as referred to and/or defined above:

The date of completion will, subject to hereinafter provided, be extended by a reasonable time even though such cause may occur after Contractor’s performance of obligation has been delayed due to other causes.

42.0 SUSPENSION OF WORK

42.1 The Owner reserves the right to suspend and reinstate execution of the whole or any part of the Works without invalidating the provisions of the Contract. Orders for suspension or reinstatement of the Works will be issued by the Engineer to the Contractor in writing. The time for completion of the works will be extended for a period equal to duration of the suspension.

42.2 Any necessary and demonstrable cost incurred by the Contractor as a result of such suspension of the works will be paid by the Owner, provided such costs
are substantiated to the satisfaction of the Engineer. The Owner shall not be responsible for any liabilities if suspension or delay is due to some default on the part of the Contractor or his Sub-Contractor.

43.0 CONTRACTOR’S DEFAULT

43.1 If the Contractor shall neglect to execute the works with due diligence and expedition or shall refuse or neglect to comply with any reasonable order given to him, in writing by the Engineer in connection with the works or shall contravene the provisions of the Contract, the Owner may give notice in writing to the Contractor to make good the failure, neglect or contravention complained of. Should the Contractor fail to comply with the notice within thirty (30) days from the date of serving the notice, then and in such case the Owner shall be at liberty to employ other workmen and forthwith execute such part of the works as the Contractor may have neglected to do or if the Owner shall think fit, without prejudice to any other right he may have under the Contract to take the work wholly or in part out of the Contractor’s hands and re-contract with any other person or persons to complete the works or any part thereof and in that event the Owner shall have free use of all Contractor’s equipment that may have been at the time on the Site in connection with the works without being responsible to the Contractor for fair wear and tear thereof and to the exclusion of any right of the Contractor over the same, and the Owner shall be entitled to retain and apply any balance which may otherwise be due on the Contract by him to the Contractor, or such part thereof as may be necessary, to the payment of the cost of executing the said part of the Works or of completing the Works as the case may be. If the cost of completing of works or executing part thereof as aforesaid shall exceed the balance due to the Contractor shall pay such excess. Such payment of excess amount shall be independent of the liquidated damages for delay, which the Contractor shall have to pay if the completion of works is delayed.

43.2 In addition, such action by the Owner as aforesaid shall not relieve the Contractor of his liability to pay liquidated damages for delay in completion of Works as defined in Clause 14.0 of this Section.

43.3 Such action by the Owner as aforesaid the termination of the Contract under this clause shall not entitle the Contractor to reduce the value of the Contract Performance Guarantee nor the time thereof. The Contract Performance Guarantee shall be valid for the full value and for the full period of the Contract including guarantee period.

44.0 TERMINATION OF CONTRACT ON OWNER’S INITIATIVE

44.1 The Owner reserves the right to terminate the Contract either in part or in full due to reasons other than those mentioned under clause entitled ‘Contractor’s Default’. The Owner shall in such an event give fifteen (15) days notice in writing to the Contractor of his decision to do so.

44.2 The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and Contracts to the extent they are related to the work terminated and terms satisfactory to the Owner, stop all further sub-contracting or purchasing activity related to the work terminated, and assist Owner in maintenance, protection, and disposition of the works acquired under the Contract by the Owner.
In the event of such a termination; the Contractor shall be paid compensation, equitable and reasonable, dictated by the circumstances prevalent at the time of termination.

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

45.0 FRUSTRATION OF CONTRACT

45.1 In the event of frustration of the Contract because of supervening impossibility in terms of Section 56 of the Indian Contract Act, parties shall be absolved of their responsibility to perform the balance portion of the Contract, subject to provisions contained in sub-clause 45.3 below.

45.2 In the event of non-availability or suspension of funds for any reasons, whatsoever (except for reason of willful or flagrant breach by the Owner) and/or Contractor then the works under the Contract shall be suspended. Furthermore, if the Owner is unable to make satisfactory alternative arrangements for financing to the Contractor in accordance with the terms of the Contract within three months of the event, the parties hereto shall be relieved from carrying out further obligations under the Contract treating it as frustration of the Contract.

45.3 In the event referred to in sub-clauses 45.1 & 45.2 above the parties shall mutually discuss to arrive at reasonable settlement on all issues including amounts due to either party for the work already done on “Quantum merit” basis, which shall be determined by mutual agreement between the parties.

46.0 GRAFTS AND COMMISSIONS ETC.

Any graft, commission, gift or advantage given, promised or offered by or on behalf of the Contractor or his partner(s), agent(s), officer(s), director(s), employee(s) or servant(s) or any one on his or their behalf in relation to the obtaining or to the execution of this or any other Contract with the Owner, shall in addition to any criminal liability which it may incur, subject the Contractor to the cancellation of this and all other Contracts and also to payment of any loss or damage to the Owner resulting from any cancellation. The Owner shall then be entitled to deduct the amount so payable from any monies otherwise due to Contractor under the Contract.

E. RESOLUTION OF DISPUTES

47.0 SETTLEMENT OF DISPUTES
47.1 Any dispute(s) or difference(s) arising out of or in connection with the Contract shall, to the extent possible, be settled amicably between the parties.

47.2 If any dispute or difference of any kind, whatsoever, shall arise between the Owner and the Contractor, arising out of the Contract for the performance of the Works whether during the progress of the Works or after its completion or whether before or after the termination, abandonment or breach of the Contract, it shall, in the first place, be referred to and settled by the Engineer, who, within a period of thirty (30) days after being requested by either party to do so, shall give written notice of his decision to the Owner and the Contractor.

47.3 Save as hereinafter provided, such decision in respect of every matters so referred shall be final and binding upon the parties until the completion of the Works and shall forthwith be given effect to by the Contractor who shall proceed with the Works with all due diligence, whether he or the Owner requires arbitration as hereinafter provided or not.

47.4 If after the Engineer has given written notice of his decision to the parties, no claim to arbitration has been communicated to him by either party within thirty (30) days from the receipt of such notice, the said decision shall become final and binding on the parties.

47.5 In the event of the Engineer failing to notify his decision as aforesaid within thirty (30) days after being requested as aforesaid, or in the event of either the Owner or the Contractor being dissatisfied with any such decision, or within thirty (30) days after the expiry of the first mentioned period of thirty days, as the case may be, either party may require that the matters in dispute be referred to arbitration as hereinafter provided.

48.0 ARBITRATION

48.1 All disputes or differences in respect of which the decision, if any, of the Engineer has not become final or binding as aforesaid shall be settled by arbitration in the manner hereinafter provided.

48.1.1 The arbitration shall be conducted by three arbitrators, one each to be nominated by the Contractor and the Owner and the third to be appointed as an umpire by both the arbitrators in accordance with the Indian Arbitration Act. 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.

48.1.2 The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration Act, 1940 or as amended thereafter or any statutory modifications thereof. The venue of arbitration shall be at any appropriate location within the territory of Arunachal Pradesh.

48.2 The decision of the majority of the arbitrators shall be final and binding upon the parties. The arbitrators may, from time to time with the consent of all the parties enlarge the time for making the award. 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.

48.3 The arbitrator shall have full powers to review and/or revise any decision, opinion, direction, certification or valuation of the Engineer in accordance with the Contract, and neither party shall be limited in the proceedings before such
arbitrators to the evidence or arguments put before the Engineer for the purpose of obtaining the said decision.

48.4 No decision given by the Engineer in accordance with the foregoing provisions shall disqualify him as being called as a witness or giving evidence before the arbitrators on any matter whatsoever relevant to the dispute or difference referred to the arbitrators as aforesaid.

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

49.0 RECONCILIATION OF ACCOUNTS

The Contractor shall prepare and submit every six months, a statement covering payments claimed and the payments received vis-à-vis the works executed, for reconciliation of accounts with the Owner. The Contractor shall also prepare and submit a detailed account of ‘Owner Issue Materials’ received and utilized by him for reconciliation purpose in a format to be discussed & finalized with the Owner before the award of Contract.

END OF GCC
ERECTION CONDITIONS OF CONTRACT (ECC)
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SECTION – ECC

ERECTION CONDITIONS OF CONTRACT

1.0 GENERAL

1.1 The following shall supplement the conditions already contained in other parts of these specifications and document and shall govern the portion of the work of this Contract to be performed at Site.

1.2 The Contractor upon signing of the Contract shall, in addition to a Project Coordinator, nominate another responsible officer as his representative at Site suitably designated for the purpose of overall responsibility and coordination of the works to be performed at Site. Such person shall function from the Site office of the Contractor during the pendency of Contract.

2.0 REGULATION OF LOCAL AUTHORITIES AND STATUTES

2.1 The Contractor shall comply with all the rules and regulations of local authorities during the performance of his field activities. He shall also comply with the Minimum Wages Act, 1948 and the Payment of Wages Act (both of the Government of India) and the rules made there under in respect of any employee or workman employed or engaged by him or his Sub-Contractor.

2.2 All registration and statutory inspection fees, if any, in respect of his work pursuant to this Contract shall be to the account of the Contractor. However, any registration, statutory inspection fees lawfully payable under any statutory laws and its amendments from time to time during erection in respect of the equipment ultimately to be owned by the Owner, shall be to the account of the Owner. Should any such inspection or registration need to be re-arranged due to the fault of the Contractor or his Sub Contractor, the additional fees to such inspection and/or registration shall be borne by the Contractor.

3.0 OWNER’S LIEN ON EQUIPMENT

The Owner shall have lien on all equipment including those of the Contractor brought to the Site for the purpose of erection, testing and commissioning of the equipment to be supplied & erected under the Contract. The Owner shall continue to hold the lien on all such equipment throughout the period of Contract. No material brought to the Site shall be removed from the Site by the Contractor and/or his Sub-Contractors without the prior written approval of the Engineer.

4.0 INSPECTION, TESTING AND INSPECTION CERTIFICATES

The provisions of the clause entitled Inspection, Testing and Inspection Certificates under Technical Specifications; Section GTC shall also be applicable to the erection portion of the Works. The Engineer shall have the right to re-inspect any equipment though previously inspected and approved by him at the Contractor’s works, before and after the same are erected at Site. If by the above inspection, the Engineer rejects any equipment, the Contractor shall make good for such rejections either by replacement or modifications/repairs as may be necessary to the satisfaction of the Engineer. Such replacement will also include the replacements or re-execution of such of those works of other Contractors and/or agencies, which might have got damaged or affected by the replacements or re-work done to the Contractor’s work.
5.0 ACCESS TO SITE AND WORKS ON SITE

5.1 Suitable access to and possession of the Site shall be afforded to the Contractor by the Owner in reasonable time.

5.2 The Owner shall have the necessary foundations to be provided by him ready, as per the agreed schedule for the execution of the individual phases of works.

5.3 The works so far as it is carried out on the Owner’s premises, shall be carried out at such time as the Owner may approve and the Owner shall give the Contractor reasonable facilities for carrying out the works.

5.4 In the execution of the works, no person other than the Contractor or his duly appointed representative, Sub-Contractor and workmen, shall be allowed to do work on the Site, except by the special permission, in writing of the Engineer or his representative.

6.0 CONTRACTOR’S SITE OFFICE ESTABLISHMENT (at least in two locations)

The Contractor shall establish a Site Office at the site and keep posted an authorized representative for the purpose of the Contract. Any written order or instruction of the Engineer or his duly authorized representative shall be communicated to the said authorised resident representative of the Contractor and the same shall be deemed to have been communicated to the Contractor at his legal address.

7.0 CO-OPERATION WITH OTHER CONTRACTORS

7.1 The Contractor shall co-operate with all other Contractors or tradesmen of the Owner, who may be performing other works on behalf of the Owner and the workmen who may be employed by the Owner and doing work in the vicinity of the Works under the Contract. The Contractor shall also so arrange to perform his work as to minimize, to the maximum extent possible, interference with the work of other Contractors and their workmen. Any injury or damage that may be sustained by the employees of the other Contractors and the Owner, due to the Contractor’s work shall promptly be made good at the Contractor’s own expense. The Engineer shall determine the resolution of any difference or conflict that may arise between the Contractor and other Contractors or between the Contractor and the workmen of the Owner in regard to their work. If the work of the Contractor is delayed because of any acts of omission of another Contractor, the Contractor shall have no claim against the Owner on that account other than an extension of time for completing his Works.

7.2 The Engineer shall be notified promptly by the Contractor of any defects in the other Contractor’s works that could affect the Contractor’s Works. The Engineer shall determine the corrective measures, if any, required to rectify this situation after inspection of the works and such decision by the Engineer shall be binding on the Contractor.

8.0 DISCIPLINE OF WORKMEN

8.1 The Contractor shall adhere to the disciplinary procedure set by the Engineer in respect of his employees and workmen at Site. The Engineer shall be at liberty to object to the presence of any representative or employee of the Contractor at the Site, if in the opinion of the Engineer the conduct of the employee is not satisfactory or is incompetent or negligent or otherwise undesirable and then the Contractor shall remove such a person objected to and provide in his place a competent replacement.
8.2 The Contractor shall employ personnel for construction works after satisfying themselves of the satisfactory character and antecedents of all personnel specially those imported from other states. Any breach of peace, faith or harmony of the local area or any act of unlawful nature or any act that causes or potential to cause breach of law and order by such personals employed by the contractor shall solely and entirely on contractor’s responsibility.

9.0 CONTRACTOR’S FIELD OPERATION

9.1 The Contractor shall keep the Engineer informed in advance regarding his field activity plans and schedules for carrying-out each part of the works. Any review of such plan or schedule or method of work by the Engineer shall not relieve the Contractor of any of his responsibilities towards the field activities. Such reviews shall also not be considered as an assumption of any risk or liability by the Engineer or the Owner or any of his representatives and no claim of the Contractor will be entertained because of the failure or inefficiency of any such plan or schedule or method of work reviewed. The Contractor shall be solely responsible for the safety, adequacy and efficiency of plant and equipment and his erection methods.

9.2 The Contractor shall have the complete responsibility for the conditions of the Work-site including the safety of all persons employed by him or his Sub–Contractor and all the properties under his custody during the performance of the work. This requirement shall apply continuously till the completion of the Contract and shall not be limited to normal working hours. The construction review by the Engineer is not intended to include review of Contractor’s safety measures in, on or near the Work-Site, and their adequacy or otherwise.

10.0 PHOTOGRAPHS AND PROGRESS REPORT

10.1 The Contractor shall furnish three (3) prints each to the Engineer of progress photographs of the work done at site. Photographs shall be taken as and when indicated by the Engineer or his representative. Photographs shall be adequate in size and number to indicate various stages of erection. Each photograph shall contain the date, the name of the Contractor and the title of the photograph.

10.2 The above photographs shall accompany the monthly progress report detailing-out the progress achieved on all erection activities as compared to the schedules. The report shall also indicate the reasons for the variance between the scheduled and actual progress and the action proposed for corrective measures, wherever necessary.

11.0 MAN-POWER REPORT

11.1 The Contractor shall submit to the Engineer, on the first day of every month, a man hours schedule for the month, detailing the man hours scheduled for the month, skill-wise and area-wise.

11.2 The Contractor shall also submit to the Engineer, on the first day of every month, a man-power report of the previous month detailing the number of persons scheduled to have been employed and actually employed, skill-wise and the areas of employment of such labour.

12.0 PROTECTION OF WORK

The Contractor shall have total responsibility for protecting his works till it is finally taken over by the Engineer. No claim will be entertained by the Owner or by the Engineer for any damage or loss to the Contractor’s works and the Contractor shall be
responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings, should any such damage to the Contractor’s works occur because of any other party not being under his supervision or control. The Contractor shall make his claim directly with the party concerned. If disagreement or conflict or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the Contractor’s works, the same shall be resolved as per the provisions of the Clause 7.0 above entitled “Cooperation with other Contractors”. The Contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such dispute. The Contractor shall proceed to repair the Work immediately and no cause thereof will be assigned pending resolution of such disputes.

13.0 EMPLOYMENT OF LABOUR

13.1 The Contractor will be expected to employ on the work only his regular skilled employees with experience of his particular work. No female labour shall be employed after darkness. No person below the age of eighteen years shall be employed.

13.2 All traveling expenses including provisions of all necessary transport to and from site, lodging allowances and other payments to the Contractor’s employees shall be the sole responsibility of the Contractor.

13.3 The hours of work on the Site shall be decided by the Owner and the Contractor shall adhere to it. Working hours will normally be eight (8) hours per day-Monday through Saturday.

13.4 The Contractor’s employees shall wear identification badges while on work at Site.

13.5 In case the Owner becomes liable to pay any wages or dues to Labour or any Government agency under any of the provisions of the Minimum Wages Act, Workmen Compensation Act, Contract Labour Regulation Abolition Act or any other law due to act of omission of the Contractor, the Owner may make such payment and shall recover the same from the Contractor’s bills.

13.6 The contractor shall be responsible for obtaining Inner Line Permits from local authorities for importing personals from outside the State as required under Bengal Frontier Regulation Act 1873.

13.7 Compliance with Labour Regulations

13.7.1 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 there-under, 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 Owner at any point of time.

13.7.2 The Contractor shall keep the Owner indemnified in case any action is taken against the Owner by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations, or notifications including amendments.

13.7.3 If the Owner is caused to pay under any law as Principal Employer such amount 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 Owner shall have the right to deduct any money due to the Contractor under this contract or any other contract with the Owner including his amount of Performance Security for adjusting the aforesaid payment. The Owner shall also have the right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Owner.

13.7.4 Salient features of some major laws applicable to establishments engaged in building and other construction works:

13.7.4.1 Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

13.7.4.2 Payment of Gratuity Act 1972: 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.

13.7.4.3 Employee P.F. and Miscellaneous Provision Act 1952: The Act provides for more contribution by the Employer plus workers @10% or 8.33%. The benefits under these 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.

iv) Maternity Benefit Act 1961: The Act provides for leave and some other benefit for women employees in case of confinement or miscarriage etc.

13.7.4.4 Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case 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 applicable to the establishments or contractor of Principal Employer if they employ 20 or more contract labour.

13.8 Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Govt. as per provision of the Act if the employment is scheduled employment.

13.9 Payment of Wages Act 1936: 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.

13.10 Equal Remuneration Act 1976: 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 transfer, training and promotions etc.

13.11 Payment of Bonds Act 1965: 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 up to Rs. 3500/- per month shall be worked out by taking wages of 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.

13.12 Industrial Dispute Act 1947: The act lays down the machinery and procedure for resolution of industrial disputes, in what situations as strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

13.13 Industrial Employment (Standing Orders) Act 1946: 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 on matters provided in the Act and gets the same certified by the designated Authority.

13.14 Trade Unions Act 1926: The Act lays down the procedure for registration of Trade Unions of workmen and Employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.


13.16 Inter-State Migrant Workmen’s (Regulation of Employment & Conditions of Service) Act 1979: 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 up to the establishment and back, etc.

13.17 The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: 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%, but not less than 1%, of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the 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 Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

13.18 Factories Act 1948: 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.

14.0 FACILITIES TO BE PROVIDED BY THE OWNER

14.1 Space

Land for Contractor’s Office, Store, Workshop etc.

a) The Engineer shall at his discretion and for the duration of execution of the Contract make available at site, land for construction of Contractor’s field office, workshop, stores, magazines for explosives in isolated locations, assembling yard etc. required for execution of the Contract. Any construction of temporary roads, offices, workshop etc. as per plan approved by the Engineer shall be done by the Contractor at his cost.

b) On completion of work the Contractor shall hand over the land duly cleaned to the Engineer. Until and unless the Contractor has handed over the vacant possession of land allotted to him for the above purpose, the payment of his final bill shall not be made. The Contractor shall be made liable to pay for the use and occupation at the rates to be determined by the Engineer if the Contractor over stays in the land after the Contract is completed.

14.2 Electricity:

**Power supply:** Where power supply is available with the Owner for construction purpose the same will be provided at the job site at one point of the distribution system at the cost of the contractor, as may be decided by Engineer/Owner at appropriate voltage as per existing regulations of the Supply Utility. The Contractor, on approvals from the supplier, shall provide and install all necessary switchgears, wiring fixtures, bulbs and other temporary equipments for further distribution and utilization. The electricity used consumed by the Contractor or its labour/staff etc., shall be charged at the prevailing tariff rate of Department of Power, Arunachal Pradesh as prevalent for that area.

14.3 Water:

Supply of water will be made available for the construction purpose wherever water is available and the same shall be given at an agreed single point at the Site at the cost of the contractor.

15.0 FACILITIES TO BE PROVIDED BY THE CONTRACTOR

15.1 Tools, tackles and scaffoldings

The Contractor shall provide all the construction equipment, tools, tackles and scaffoldings required for pre-assembly, erection, testing and commissioning of the equipment covered under the Contract. He shall submit a list of all such materials to the Engineer before the commencement of pre-assembly at Site. These tools and tackles shall not be removed from the Site without the written permission of the Engineer.

15.2 Communication

The contractor will arrange their own telephone and telex facilities from the local service provider, for the purpose of Contract at their own cost and expenses. The owner shall facilitate with the certification for application etc. if required in obtaining such connections.

15.3 First-aid
15.3.1 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.

15.3.2 The Owner will provide the Contractor, in case of any emergency, the services of an ambulance for transportation to the nearest hospital.

15.4 Cleanliness

15.4.1 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 Engineer. 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.

15.4.2 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 Engineer. Proper sanitary arrangement shall be provided by the Contractor, in the work areas, office and residential areas of the Contractor.

16.0 Lines and Grades

All the works shall be performed to the lines, grades and elevations as would be indicated on the drawings. The Contractor shall be responsible to locate and lay-out the works. Basic horizontal and vertical control points will be established and marked by the Engineer at site at suitable points. These points shall be used as datum for the works under the Contract. The Contractor shall inform the Engineer well in advance of the times and places at which he wishes to do work in the area allotted to him so that suitable datum points may be established and checked by the Engineer to enable the Contractor to proceed with his works. Any work done without being properly located may be removed and/or dismantled by the Engineer at Contractor’s expense.

17.0 Fire Protection

17.1 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.

17.2 Similarly, corrugated paper, fabricated cartons etc. will not be permitted in the construction area either for 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.
17.3 All the Contractor’s supervisory personnel and sufficient number of workers shall be trained for fire fighting 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.

17.4 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.

18.0 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 Engineer in the prescribed manner.

19.0 CONTRACTOR’S AREA LIMITS

The Engineer 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 Engineer.

20.0 CONTRACTOR’S CO-OPERATION WITH THE OWNER

In case where the performance of the erection work by the Contractor affects the operation of the system facilities of the Owner, such erection work of the Contractor shall be scheduled to be performed only in the manner stipulated by the Engineer and the same shall be acceptable at all times to the Contractor. The Engineer 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 Owner and the Contractor shall strictly adhere to such restrictions and co-operate with the Engineer. 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.

21.0 PRE-COMMISSIONING TRIALS AND INITIAL OPERATIONS

The pre-commissioning trials and initial operations of the equipment furnished and erected by the Contractor shall be the responsibility of the Contractor as detailed in relevant clauses in Technical Specifications, Section GTC. The Contractor shall provide, in addition, test instruments, calibrating devices etc. and labour required for successful performance of these trials. If it is anticipated that the above test may prolong for a long time, the Contractor’s workmen required for the above test shall always be present at Site during such trials.
22.0 MATERIALS HANDLING AND STORAGE

22.1 All the equipments furnished under the Contract and arriving at Site shall be promptly received, unloaded, transported and stored in the storage spaces by the Contractor.

22.2 Contractor shall be responsible for examining all the shipment and notify the Engineer immediately of any damages, storage, discrepancy etc. for the purpose of Engineer’s information only. The Contractor shall submit to the Engineer 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.

22.3 The Contractor shall maintain an accurate and exhaustive record detailing out the list of all equipments received by him for the purpose of erection and keep such record open for the inspection of the Engineer in-charge.

22.4 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 Engineer. 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.

22.5 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 rings, commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected.

22.6 All the electrical equipment such as motors, generators, etc. shall be tested for insulation resistance at least once in three months from the date of receipt till the date of commissioning and a record of such measured insulation values maintained by the Contractor. Such records shall be opened for inspection by the Engineer.

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

22.8 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.

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

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

22.11 The Contractor shall be responsible for making suitable indoor storage facilities to store all equipments, which require indoor storage. Normally all the electrical equipments such as motors, control gears, generators, exciters and consumables like electrodes, lubricants etc. shall be stored in the closed storage space. The Engineer, 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.

23.0 CONSTRUCTION MANAGEMENT

23.1 The field activities of the Contractors, working at Site, will be coordinated by the Engineer and the Engineer’s decision shall be final in resolving any disputes or conflicts between the Contractor and other Contractors and the tradesmen of the Employer regarding scheduling and coordination of work. Such decision by the Engineer shall not be a cause for extra compensation or extension of time for the Contractor.

23.2 The Engineer shall hold weekly meetings of all the Contractors working at Site, at a time and place to be designated by the Engineer. The Contractor shall attend such meetings and take notes of discussions during the meeting and the decision of the Engineer and the contractor shall strictly adhere to those decisions in performing his works. In addition to the above weekly meeting, the Engineer may call for other meetings either with individual Contractor or with selected number of Contractors and in such a case the Contractor if called, will also attend such meetings.

23.3 Time is the essence of the Contract and the Contractor shall be responsible for performance of his works in accordance with the specified construction schedule. If at any time, the Contractor is falling behind the schedule, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise accelerate the progress of the work to comply with the schedule and shall communicate such actions in writing to the Engineer, satisfying that his action will compensate for the delay. The Contractor shall not be allowed any extra compensation for such action.

23.4 The Engineer shall, however, not be responsible for provision of additional labour and/or materials or supply or any other services to the Contractor except for the coordination work between various Contractors as set out earlier.

24.0 FIELD OFFICE RECORDS

The Contractor shall maintain at his Site office up to date copies of all drawings, specifications and other Contract Documents and any other supplementary data complete with all the latest revisions thereto. The Contractor shall also maintain in addition the continuous record of all changes to the above Contract Documents, drawings, specifications, and supplementary data etc. effected at the field and on completion of his total assignment under the Contract shall incorporate all such changes on the drawings and other Engineering data to indicate as installed conditions of the equipment furnished and erected under the Contract. Such drawings and Engineering data shall be submitted to the engineer in required number of copies.

25.0 CONTRACTOR’S MATERIALS BROUGHT ON TO SITE

25.1 The Contractor shall bring to Site all equipments, components, parts, materials, including construction equipments, tools and tackles for the purpose of the works under intimation to the Engineer. All such goods shall, from the time, of their being brought vest in the Owner, but may be used for the purpose of the works only and shall not on any account be removed or taken away by the Contractor without the written permission of the Engineer. The Contractor shall nevertheless be solely liable and responsible for any loss or destruction thereof and damage thereto.
25.2 The Owner shall have a lien on such goods for any sum or sums which may at any time be due or owing to him by the Contractor, under, in respect of or by reasons of the Contract. After giving a fifteen (15) days notice in writing of his intention to do so, the Owner shall be at liberty to sell and dispose off any such goods, in such manner as he shall think fit including public auction or private treaty and to apply the proceeds in or towards the satisfaction of such sum or sums due as aforesaid.

25.3 After the completion of the Works, the Contractor shall remove from the Site under the direction of the Engineer the materials such as construction equipments, erection tools and tackles, scaffolding etc. with the written permission of the Engineer. If the Contractor fails to remove such materials, within fifteen (15) days of issue of a notice by the Engineer to do so then the Engineer shall have the liberty to dispose off such materials as detailed under Clause 25.2 above and credit the proceeds thereto to the account of the Contractor.

26.0 PROTECTION OF PROPERTY AND CONTRACTOR’S LIABILITY

26.1 The contractor shall be responsible for any damage resulting from his operations. He shall also be responsible for protection of all persons including members of public and employees of the Owner and the employees of other Contractors and Sub-Contractors and all public and private property including structures, buildings, other plants and equipments and utility either above or below the ground.

26.2 The Contractor will ensure provision of necessary safety equipments such as barriers, signboards, warning lights and alarms, etc. to provide adequate protections to persons and property. The contractor shall be responsible to give reasonable notice to the engineer and the owner of public or private property and utilities when such property and utilities are likely to get damaged or injured during the performance of his works and shall make all necessary arrangements with such Owners, related to removal and/or replacement or protection of such property and utilities.

27.0 PAINTING

All exposed metal parts of the equipment including piping, structures, railing etc. wherever applicable, after installation unless otherwise surface protected, shall be first painted with at least one coat of suitable primer which matches the shop primer paint used, after thoroughly cleaning all such parts of all dirt, rust, scales, grease, oil and other foreign materials by wire brushing, scraping or sand blasting and the same being inspected and approved by the Engineer for painting. Afterwards, the above parts shall be finished painted with two coats of allowed resin machinery enamel paints. The quality of the finish paint shall be as per the standards of ISI or equivalent and shall be of the colour as approved by the Engineer.

28.0 INSURANCE

28.1 In addition to the conditions covered under the Clause 37 entitled ‘Insurance’ in General Conditions of Contract(GCC) of Part-III, the following provisions will also apply to the portion of works to be done beyond the Contractor’s own or his Sub-Contractor’s manufacturing Works.

28.2 Workmen’s Compensation Insurance

This insurance shall protect the Contractor against all claims applicable under the Workmen’s Compensation Act, 1948 (Government of India). This policy
shall also cover the Contractor against claims for injury, disability, disease or death of his or his Sub-Contractor’s employee, which for any reason are not covered under the Workmen’s Compensation Act, 1948. The liabilities shall not be less than:

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<tr>
<th></th>
<th>Workmen’s Compensation Provisions</th>
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<tbody>
<tr>
<td>Employee’s Liability</td>
<td>As per statutory Provisions</td>
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</table>

28.3 **Comprehensive Automobile Insurance**

This insurance shall be in such a form to protect the Contractor against all claims for injuries, disability, disease and death to members of public including the Owner’s men and damage to the property of others arising from the use of motor vehicles during, on or off the Site operations, irrespective of the Employership of such vehicles. The liability covered shall be as herein indicated:

- **Fatal Injury**: Rs. 1,00,000.00 each person
  Rs. 2,00,000.00 each occurrence
- **Property Damage**: Rs. 1,00,000.00 each occurrence

28.4 **Comprehensive General Liability Insurance**

28.4.1 The insurance shall protect the Contractor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others, due to any act of omission on the part of the Contractor, his agents, his employees, his representatives and Sub-Contractors or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the Contractor arising out of the Clause 19 entitled ‘Defense of Suits’ under General Conditions of Contract (GCC) of Part-III (Vol-1/3).

28.4.2 The hazards to be covered will pertain to all the works and areas where the Contractor, his Sub-Contractors, his agents and his employees have to perform work pursuant to the Contract.

28.5 The above are only illustrative list of insurance covers normally required and it will be the responsibility of the Contractors to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect, in pursuance of the Contract.

29.0 **UNFAVOURABLE WORKING CONDITIONS**

The Contractor shall confine all his field operations to those works, which can be performed without subjecting the equipment and materials to adverse effects during inclement weather conditions, like monsoon, storms etc. and during other unfavorable construction conditions. No field activities shall be performed by the Contractor under conditions, which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the Contractor in a proper and satisfactory manner in the performance of such Works and with the concurrence of the Engineer. Such unfavorable construction conditions will in no way relieve the Contractor of his responsibility to perform the Works as per the schedule.

30.0 **PROTECTION OF MONUMENTS AND REFERENCE POINTS**
The Contractor shall ensure that any finds such as relic, antiquity, coins, fossil etc. which he may come across during the course of performance of his Works either during excavation or elsewhere, are properly protected and handed over to the Engineer. Similarly the Contractor shall ensure that the bench marks, reference points etc. which are marked either with the help of engineer or by the Engineer shall not be disturbed in any way during the performance of his Works. If any work is to be performed which disturbs such reference the same shall be done only after these are transferred to other suitable locations under the direction of the Engineer. The Contractor shall provide all necessary materials and assistance for such relocation of reference points etc.

31.0 WORK & SAFETY REGULATIONS

31.1 The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to the Owner 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 Engineer, as he may deem necessary.

31.2 The Contractor will notify well in advance to the Engineer 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 Engineer 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 Engineer 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 Owner and the Owner shall not entertain any claim of the Contractor towards additional safety provisions/conditions to be provided for/constructed as per the Engineer’s instructions.

Further, any such decision of the Engineer 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 Engineer, the Contractor shall use alternative methods with the approval of the Engineer without any cost implication to the Owner or extension of work schedule.

31.3 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, Explosives Act, 1948 and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Engineer. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.

31.4 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 the Owner in this regard.

31.5 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, Indian Electricity Act 1910 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 or by the person authorized by him.

31.6 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.

31.7 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 Engineer who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability.

31.8 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 pertaining to handling, storage and use of explosives.

31.9 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.

31.10 The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Owner or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by the Owner to handle such fuses, wiring or electrical equipment

31.11 Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contractor or Owner, he shall:
   a. Satisfy the Engineer that the appliance is in good working condition;
   b. Inform the Engineer of the maximum current rating, voltage and phases of the appliances;
   c. Obtain permission of the Engineer detailing the sockets to which the appliances may be connected.

31.12 The Engineer 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.

31.13 No electric cable in use by the Contractor/Owner 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.

31.14 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Engineer and a permit to work shall be issued by the Engineer 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.
31.15 The Contractors shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installation.

31.16 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 Engineer 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.

31.17 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 Engineer in prescribed form and also to all the authorities envisaged under the applicable laws.

31.18 The Engineer 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 Engineer within 3 days of such stoppage of work and decision of the Engineer in this respect shall be conclusive and binding on the Contractor.

31.19 The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided in clause 31.18 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.

31.20 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 fire fighting 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.

31.21 The Contractor shall follow and comply with the Owner’s 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 Owner’s Safety Rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.

31.22 If the Contractor fails in providing safe working environment as per Owner’s Safety Rules or continues the work even after being instructed to stop work by the Engineer as provided in clause 31.18 above, the Contractor shall promptly pay to the Owner, on demand by the Owner, compensation at the rate of Rs. 5,000/- (Rupees five thousand) per day or part thereof till the instructions are complied with and so certified by the Engineer. However, in case of accident taking place, causing injury to any individual, the provisions contained in Clause 31.23 shall also apply in addition to compensation mentioned in this clause.

31.23 If the Contractor does not take all safety precautions and/or fails to comply with the Safety Rules as prescribed by the Owner or under the applicable law for the safety of the equipment and plant and for the safety of personnel and the Contractor does not prevent hazardous conditions which cause injury to his own employees or employees of other Contractors or Owner’s employees or any other person who are at Site or adjacent thereto, the Contractor shall be responsible for payment of compensation to the Owner as per the following schedule (These are applicable for death/injury to any person, whatsoever):

<table>
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<tr>
<th>Description</th>
<th>Compensation</th>
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<tr>
<td>a. Fatal injury or accident causing death</td>
<td>Rs. 1,00,000/- per person.</td>
</tr>
<tr>
<td>b. Major injuries or accident causing death 25% or more permanent disablement to workmen or employees.</td>
<td>Rs. 20,000/- per person.</td>
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Permanent disablement shall have same meaning as indicated in Workmen’s Compensation Act. The compensation mentioned above shall be in addition to the compensation payable to the workmen/employees 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 Owner is made to pay such compensation then the Contractor is liable to reimburse the Owner such amount in addition to the compensation indicated above.

31.24 If the Contractor observes all the Safety Rules and Codes, Statutory Laws and Rules during the currency of Contract awarded by the Owner and no accident occurs then the Owner 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.

32.0 CODE REQUIREMENTS

The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant Codes and accepted good engineering practice, the Engineer’s drawings and other applicable Indian recognized codes and laws and regulation of the Government of India.

33.0 FOUNDATION DRESSING & GROUTING

33.1 The surfaces of foundation shall be dressed to bring the top surface of the foundation to the required level, prior to placement of equipment/equipment bases on the foundation.

33.2 All the equipment bases and structural steel base plates shall be grouted and finished as per these specifications unless otherwise recommended by the equipment manufacturer.

33.3 The concrete foundation surfaces shall be properly prepared by chipping and/or grinding as required to bring the type of such foundation to the required level to provide the necessary roughness for bondage and to ensure enough bearing strength. All laitance and surface film shall be removed and cleaned.

33.4 Grouting Mix

The grouting mixture shall be composed of Portland cement, sand and water. The Portland cement to be used shall conform to ISI: 269 or equivalent. Sand shall conform to ISI: 383/2386 or equivalent. The grout proportions for flat bases where the grouting space does not exceed 35 mm shall be 50 Kg bag of cement to 75 Kg of sand. Only the required quantity of water shall be added so as to make the mix quaky and flowable and the mix shall not show excess water on top when it is being puddled in place. For thicker grout beds up to 65 mm, the amount of sand shall be increased to 105 Kg per bag of cement. Bases which are hollow and are to be filled full of grouting shall be filled to a level of 25 mm above the outside rim with a mortar mix in the volumetric proportion of one part of cement and 1.5 part sand and 1.5 part 6 mm granite gravel. An acceptable plasticizer may be added to the grout mixes in a proportion recommended by the plasticizer’s manufacturer. All such grouts shall be thoroughly mixed for not less than five minutes in an approved mechanical mixer and shall be used immediately after mixing.

33.5 Placing of Grout

33.5.1 After the base has been prepared, its alignment and level has been checked and approved and before actually placing the grout a low dam shall be set around the base at a distance that will permit pouring and
manipulation of the grout. The height of such dam shall be at least 25 
millimeters above the bottom of the base. Suitable size and number of chains 
shall be introduced under the base before placing the grout, so that such 
chains can be moved back and forth to push the grout into every part of 
the space under the base.

33.5.2 The grout shall be poured either through grout holes provided or shall 
be poured at one side or at two adjacent sides giving it a pressure head 
to make the grout move in a solid mass under the base and out in the 
opposite side. Pouring shall be continued until the entire space below 
the base is thoroughly filled and the grout stands at least 25 millimeters 
higher all around than the bottom of the base. Enough care should be taken to 
avoid any air or water pockets beneath the bases.

33.6 **Finishing of the Edges of the Grout**

The poured grout should be allowed to stand undisturbed until it is well set. 
Immediately thereafter, the dam shall be removed and grout, which extends 
beyond the edges of the structural or equipment base plates shall be cut off, 
flushed and removed. The edges of the grout shall then be pointed and finished 
with 1:2 cement mortar pressed firmly to bond with the body of the grout and 
smoothened with a tool to present a smooth vertical surface. The work shall be 
done in a clean and scientific manner and the adjacent floor spaces, exposed 
edges of the foundations, and structural steel and equipment base plates shall be 
thoroughly cleaned of any spillage of the grout.

33.7 **Checking of Equipment after Grouting**

After the grout is set and cured, the Contractor shall check and verify the 
alignment of equipment, alignment of shafts of rotating machinery, the slopes 
of all bearings, pedestals, centering of rotors with respect to their sealing bores, 
couplings etc. as applicable and the like items to ensure that no displacement 
has taken place during grouting. The values recorded prior to grouting shall be 
used during such post grouting checkup and verification. Such pre and post 
grout records of alignment details shall be maintained by the Contractor in a 
manner acceptable to the Engineer.

34.0 **SHAFT ALIGNMENTS**

All the shafts of rotating equipment shall be properly aligned to those of the matching 
equipment to as perfect and accurate as practicable. The equipment shall be free from 
excessive vibration so as to avoid overheating of bearings or other conditions, which 
may tend to shorten the life of the equipment. All bearings, shafts and other rotating 
parts shall be thoroughly cleaned and suitably lubricated before starting.

35.0 **DOWELLING**

All the motors and other equipment shall be suitably dowelled after alignment of shafts 
with tapered machined dowels as per the direction of the Engineer.

36.0 **CHECK OUT OF CONTROL SYSTEMS**

After completion of wiring, cabling furnished under separate specification and laid and 
terminated by the Owner, the Contractor shall check out the operation of all control 
system for the equipment furnished and installed under these specifications and 
documents.
37.0 CABLELING

37.1 All cables shall be supported by conduits or cable trays run in air or in cable channels. These shall be installed in exposed runs parallel or perpendicular to dominant surface with right angle turn made of symmetrical bends for fittings. When cables are run on cable trays, they shall be clamped at minimum intervals of 2000 mm or otherwise as directed by the Engineer.

37.2 Each cable, whether power or control, shall be provided with a metallic or plastic tag of an approved type, bearing a cable reference number indicated in the cable and conduit list (prepared by the Contractor), at every 5 metre run or part thereof and at both ends of the cable adjacent to the terminations. Cable routing is to be done in such a way that cables are accessible for any maintenance and for easy identification.

37.3 Sharp bending and kinking of cables shall be avoided. The minimum radii for PVC insulated cables 1100 V grade shall be 15 D where D is the overall diameter of the cable. Installation of other cables like high voltage, coaxial, screened compensating, mineral insulated shall be in accordance with the cable manufacturer’s recommendations. Wherever cables cross roads and water, oils, sewage or gas lines, special care should be taken for the protection of the cables in designing the cables channels.

37.4 In each cable run some extra length shall be kept at a suitable point to enable one or two straight through joints to be made, should the cable develop fault at a later date.

37.5 Control cable terminations shall be made in accordance with wiring diagrams, using identifying codes subject to Engineer’s approval. Multi-core control cable jackets shall be removed as required to train and terminate the conductors. The cable jacket shall be left on the cable, as far as possible, to the point of the first conductor branch. The insulated conductors from which the jacket is removed shall be neatly twined in bundles and terminated. The bundles shall be firmly, but not tightly, tied utilizing plastic or nylon ties or specially treated fungus protected cord made for this purpose. Control cable conductor insulation shall be secure and even.

37.6 The connectors for control cables shall be covered with a transparent insulating sleeve so as to prevent accidental contact with ground or adjacent terminals and shall preferably be terminated in elmex terminals and washers. The insulating sleeve shall be fire resistant and shall be long enough to over pass the conductor insulation. All control cables shall be fanned out and connection made to terminal blocks and test equipment for proper operation before cables are corded together.

END OF ECC
SPECIAL CONDITIONS OF CONTRACT (SCC)

(the division shall make up by altering, deleting, adding or editing the contents of this section as per requirement for each of the tenders to be invited and seek approval of the competent authority)
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<tr>
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SECTION-V

SPECIAL CONDITION OF CONTRACT

1.0 GENERAL INFORMATION

The following Special Conditions of Contract shall supplement the General Terms & Conditions of Contract (GCC). Wherever there is a conflict the provision herein shall prevail over those in the General Conditions of Contract.

1.1 The requirement, conditions, etc. stated in different volumes shall apply to and shall be considered as part of this Volume, as if bound together. In case of any discrepancy between the provisions of this Section and other Section(s) of any Part(s) and Volume(s), the provision of this Volume shall prevail. However, for scope of work, Technical Specification in Volume: 3/3 of Part-III shall prevail over all other Volume(s)/Section(s) of Bid document.

1.2 Unless brought out clearly, the Bidder shall be deemed to conform strictly to the provisions of the bidding documents. All deviations to the specification shall be clearly brought out in respective schedules of deviations. Any discrepancy between specification and bid if not clearly brought out in the schedule, will not be considered as a valid deviation.

1.3 Unless defined or specified elsewhere in this document, the terms OWNER, EMPLOYER, DEPARTMENT shall mean Department of Power, Government of Arunachal Pradesh and represented by the Executive Engineer (Elect).

1.4 The instructions to bidders, the requirements and actions incorporated in this bid document shall automatically stand modified, or deemed to be treated as amended by such new set over-riding procedures prescribed therein when e-tenders are invited in electronic (e-NIT) mode on-line.

2.0 BROAD OUTLINE ON SCOPE OF WORK

The proposed work under this tender comprises of the following activities which inter-alia given in the Schedule 3 & 4 of Volume 1/3 of part-III (BOQ) and as defined in the Bid document:-

2.1 (The Owner shall give broad and brief outline of the proposed work to be executed under this tender) Refer clause 26 of the SCC and Enclosure-5 of Vol-1/3.
3.0 BASIS OF BID EVALUATION AND BIDDING SCHEDULE

3.1 The quantities of various items for the package are indicated in the respective sections of Bid Proposal Letter (BPL), of the Bidding documents, which are only provisional. For evaluation purpose, total prices for ex-works, transportation & insurance charges, erection charges etc. will be considered on the basis of such provisional quantities specified under the respective Schedules of BPL. However, the Contractor shall be paid for actual quantity of items supplied & erected based on the unit rates quoted by the Bidder & incorporated in the Contract. For this purpose unit rates for each item as required in the Bid Proposal Letter are also to be quoted. Further, the brief description shall not be construed to limit the scope of work, and the same shall be read in conjunction with corresponding Sections of Technical section including amendments/errata, if any, thereto.

3.2 Conditional rebates, if any, offered by any Bidder shall not be considered in Bid evaluation.

3.3 Bidder has to quote for the complete scope of work for the package. Bids for individual items or incomplete services shall be treated as incomplete and non-responsive, and are liable to be rejected.

3.4 Basis of Comparison

Pursuant to Clause 35.0, Section-INB, of Volume-1/3 of Part-III, Bids shall be compared on the basis of lump sum price for entire scope of work under the packages, which shall include ex-works price, transportation & insurance charges and erection charges and all applicable taxes & duties such as excise duty, sales tax, service tax and any other taxes/duties/levies etc. applicable solely on the transaction between the contractor and the Owner and octroi/entry tax on bought-out finished items, as applicable on the date of Bid opening.

3.5 Differential Price evaluation mentioned in Clause 34 of INB, shall be applied only when any turn-key contracts are invited on lump-sum basis without detailed BOQ in the bid document by the owner, allowing the bidders to offer their choice of technology, configuration and designs.

4.0 WORK PLAN AND SCHEDULE

4.1 The broad outline of the milestone to be achieved in the project and their respective completion period of the project components are indicated below and the contractor shall make detailed PERT and submit the Critical Path duly identified for the owner to monitor the progress during the execution.

4.2 The detailed work plan is placed at Enclosure-6 of the Section"Enclosures” of SCC. Refer clause 26 of SCC.

5.0 CONTRACT PRICE AND PRICE BASIS

5.1 Contract Price

The contract price of this work shall be the prices of goods and services (supplying and erection) defined hereunder;

5.1.1 The Bidder shall indicate on the appropriate Price Schedules attached to these documents, the unit prices and total Bid prices of the goods and services, it proposes to provide under the contract.
5.1.2 Read with the clause 14 of INB, price indicated in the Price Schedules shall be entered separately in the following manner:

**5.1.2.1 GOODS or SUPPLIES**

(i) The price of the goods OR SUPPLIES, quoted ex-works;

(ii) Applicable Taxes & Duties such as excise duty, Central sales tax, octroi and other taxes (except 4% state VAT) and incidental costs on Supplies of Goods shall be treated as INCLUSIVE to the Ex-work Price.

(iii) State Sales Tax (known as VAT or Entry Tax) is levied by the state govt. at the rate of 4% simplified tax or other-wise, shall be applicable which should be shown separately in the BOQ.

(iv) Charges for inland transportation & insurance and incidental to delivery of the goods to their final destination shall be treated as inclusive in supplies (Goods) price.

**5.1.2.2 SERVICES (Erection, Operation and Maintenance Charges)**

i) On site activities, erection, fitting, installation, testing, commissioning and other services and service taxes thereon shall be inclusive to “Erection Charges”.

ii) Operation and maintenance of the assets created before handing over shall form part of this contract and the cost shall be inclusive of the services provided by the bidder.

6.0 **MODE OF PAYMENT**

All payments under the contract shall be released directly to the Contractor.

7.0 **ERECTION INSURANCE**

In addition to conditions specified in Clause 37.0, Section-GCC, following shall also apply:

All the equipment and materials being supplied by the Contractor shall be kept completely insured by the Contractor at his cost from the time of dispatch from the Contractor's/sub-vendor's works, up to the completion of erection and final checking, testing and commissioning at site and subsequent taking over by the Owner.

It shall 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 and the Owner shall be kept informed about it. The Contractor shall replace the lost/damaged equipment/materials promptly irrespective of the settlement of the claims by the underwriters and ensure that the work progress is as per agreed schedule. The losses, if any, in such replacement shall have to be borne by the Contractor.

8.0 **LIQUIDATED DAMAGES FOR DELAY AND PENALTY FOR DEFAULT:**

**8.1** If the erection and testing & commissioning and handing over of the equipments by the contractor is delayed beyond the Scheduled date, as stipulated in this contract time extensions shall be granted thereof and the Owner may recover liquidated damages @ 0.5% (Half percent) of the total Contract Price for the Package for each week of delay or part thereof in the handing over of the project. The liquidated damage recovered due to delays caused with successful completion of the work shall not be treated as penalty or punishment to the contractor. This would be treated as disincentives to the contractor.

**8.2** The above amount of liquidated damages shall be subject to a maximum of ten percent (10%) of the contract price in addition to any penalty as may be necessary
in the event of default and breach of contract and losses caused thereof to the Owner.

8.3 The “Owner” may impose **Penalty** on the contractor for any act of his/their default or breach of contract by forfeiting the Bid Guarantee or by recovering from Contract Securities retained with the Owner or by adjustment from the payable dues of the contractor.

9.0 **BID GUARANTEE**

9.1 The Bid Guarantee of value as indicated in Enclosure-9 of section “Enclosures” of SCC shall accompany the bid in the original and three photocopies of the original in the manner as set forth in Clause 22.0, Section-INB of Part-III and Conditions of contract of the Bidding documents.

9.2 Any Bid not accompanied by a Bid Guarantee as set forth in Clause 22.0, Section INB of Part-III (Vol. 1/3), General Terms & Conditions of Contract & herein above shall be rejected by the Owner as non-responsive.

10.0 **QUANTITY DEVIATION AND MEASUREMENT**

10.1 The quantities of all equipment/materials given in the Bill of Quantities (BOQ) of the Bidding documents are provisional. The final quantity shall depend on the actual quantities those would be required as per actual survey and erected at site. The Contractor shall be responsible for supply, erection and execution of such final quantities for completion of the work and they shall be paid for such finalized quantity at the unit rate indicated in the Letter of Award and the quantity erected at site as per measurement.

10.2 If the Owner finds it expedient to get additional work to be done under the same contract, or finds it necessary to curtail the contracted quantity of works due to un-avoidable reasons or he finds deviations in the actual survey, designs and drawings, the owner reserves the right to increase or decrease the quantity of goods and services (works) to the extent of +50% & -25% (plus fifty percent & minus twenty five percent) of the contract price, by way of suitable amendments to the contract, without any change of unit rate/price and /or other terms & conditions during the validity of the contract.

10.3 The contractor shall submit Deviation Proposal (increase or decrease or even on No Deviations) immediately after the survey is completed but before placement of orders to their vendors not exceeding 30% of contracted quantity. The deviation proposed shall be verified by the owner for issuing amendment order to that effect by him. The owner shall pass such order before completion of the erection of the 25% of the ordered quantity. In absence of any deviation proposal and order thereof, if the contractor completes the entire work of this contract at his own discretion, the payable amount shall be to the extent of work value( both supply & erection etc.) as per measurement or the original award value of work as per LOA whichever would be LOWER.

11.0 **GUARANTEE PERIOD (Stipulated in GCC Clause 15)**

The guarantee period of all the equipments to be supplied under the package shall be 1 (One) year from the date of handing over to owner after successful testing and commissioning to the satisfaction of the Engineer-in-Charge/Owner.
12.0 STORAGE
The owner shall provide suitable space for storing of the equipments at his own premises. However the contractor shall be responsible for safety and security of the equipments. The contractor shall maintain a proper record of all materials stored and taken out from the store for installation purpose. Before taking out any material from the store, proper authorization from the owner shall be taken by the contractor.

13.0 GUIDING CPWD CODE
13.1 The terms and conditions of this contract are self defining without any probable ambiguities. However, in the event of any difficulties in implementations of this contract due to some discovered ambiguities or certain situation not stipulated or explained in this contract, the CPWD code shall be treated as a guiding code for the purpose.

13.2 All provisions of the latest CPWD code in various volumes and circulars, unless modified in this document shall be applicable for all tenders invited with this document. Any disputed conflict arises shall be settled as per CPWD code.

14.0 TURN-KEY CONCEPT OF WORK:- (Completeness of work up to Commissioning)
This contract shall be operative under the “Turn Key Concept”, fixing the entire responsibilities to the contractor; the entire work, including survey, planning, designing and seeking intermediate approvals, “Commissioning of the project” and up to handing over to the Owner. All such items of work or supplies, not expressly listed or described in the Bill of Quantities (BOQ), but are necessarily integral part of the entire turn-key project or mistakenly missed-out in the BOQ or left out at any time up to the stage of award of the contract and discovered during the time of execution by the contractor, without which the system can not be considered complete for commercial operation of the entire project, shall be treated as listed and included to be supplied, erected and commissioned by the contractor without any extra cost to the owner. The bidder has the complete responsibility of making all arrangements to accomplish the desired target of this turn-key work under this contract either suo-moto or on the instructions issued by the Owner. Some of the items are; any incidental right of way, clearing and developing of site, finishing of works with required accessories, fittings and fixtures, cleaning, polishing, varnishing, paintings, compensations of any type incidental to the work, etc. In other words, there shall be no extra items payable in this contract unless there is a change in the scope of work due to change of technology or specification on the written order of the owner. Having this clause understood, the bidder has to quote his prices inclusive of all such contingencies. Any claim on the plea by the contractor for extra payment on any extra item shall not be entertained. The contractor may bring out any major deviations or discrepancies involving considerable costs or major shift in technology and specification in writing before submission of the tender.

15.0 DRAWING AND DESIGN
The bidders shall submit the design & drawing of all the structures and equipments to the owner for necessary approval before creating of the liabilities. If the department does not approve or respond within 30 days of the personal appearance for the same by the contractor, the contractor shall inform the next higher authority and proceed with the work.
16.0 APPROVED VENDORS/ MANUFACTURERS

16.1 The bidders shall ensure supply of listed equipments and materials from registered manufacturers of the owner.

16.2 In absence of registered manufacturers for all or some of the items, the bidders shall submit their list of proposed vendors/manufacturers from which the bidder intends to procure the said items for approval of the owner.

17.0 ESTABLISHMENT OF PROJECT OFFICE

17.1 It shall be mandatory for the contractor to establish project offices at the locations prescribed in Enclosure-7 of SCC. [Refer cl 26 of SCC]

17.2 The contractor shall within 30 days of award inform the owner in writing the following:

i. Full address of Project/Site office.

ii. Phone, mobile and Fax no of the Site/Project office.

iii. Name of staff who would be heading each of the offices

iv. Full communication address with the name of competent contact person, his designation etc in the corporate office.

18.0 COMMISSIONING AND COMPLETION OF WORK

For the purpose of clear understanding of the contract the word “Commissioning” and “Completion of Work” shall have the following meanings:

18.1 The entire assets, as described in this contract, including the extra and deviated items, erected, comprising of all the sub-assemblies, modules and equipments, tested and put into “Un-interrupted Healthy Commercial Operation”, simultaneously for an “Observation Period” of not less than 45 (or as decided for each contract) days, from the date of declaration of “Completion of Tests” of all items and test operation by the contractor.

18.2 “Un-interrupted Healthy Commercial Operation” shall mean that the said system shall function without break and interruptions due to internal failures or latent defects or bad workmanship, not owing to induced external faults. The countdown shall re-set each time a failure or internal fault occurs during the observation period and the contractor shall revise the date of declaration of “Completion of Tests” on each occasion or on any date, the contractor considers appropriate.

18.3 The successful operation of the work/project for the entire “Observation Period” shall be the basis for declaring the work “Completed” as per this contract.

18.4 [ the tendering authority may give additional definitions at Enclosure-8 of SCC [ref cl 26 of SCC]

19.0 CLOSURE OF THE TURNKEY CONTRACT

The turn-key contract shall be considered complete and closed when the Owner issues the following certificates:-

19.1 Completion Certificate:- “Completion Certificate” shall be issued on successful physical completion of the entire scope of work when the project is declared “Completed”, as defined at clause 18 of SCC.

19.2 Contract Closure Certificate:- The Contract Closure Certificate(CCC) shall be issued subsequently after issue of “Completion Certificate” and clearing of all
liabilities of the contract from either side after handing over of the assets/systems. In case of AMC a part of this contract the CCC shall be issued only after the completion of successful AMC.

19.3 The Contract Performance Guarantee or any other securities held by the Owner shall be released only after CCC is issued.

20.0 AUTO-RENEWAL OF CONTRACT PERFORMANCE GUARANTEE.

Till the contract is closed by the Owner, bidder shall be liable for its time extension well before its expiry and the owner shall be at liberty to liquidate the Performance Guarantee for breach of contract at any time.

21.0 BUFFER STOCK AND SITE WORK CONTINUITY

The bidder shall provide adequate buffer stock to supply and install under this contract during the entire project period in order to maintain the flow of materials and continuation of site activities towards successful completion of this contract.

22.0 OPERATION AND MAINTENANCE OF THE SYSTEMS.

22.1 The bidder shall operate and maintain the systems created under this contract seamlessly till the same is handed over to the owner, co-terminus with the “closure of contract” if AMC is a part of this contract.

22.2 If the Annual Maintenance Contract (AMC) has been made a part of this Contract and BOQ has been provided with year-wise AMC pricing, the bidder has the obligation to continue this entire contract till the end of the AMC period, which shall be for a period not exceeding 5 (five) years from the date of “Commissioning and Completion of Work” as per clause 18 of SCC.

22.3 If AMC is part of this contract then, commencement of the AMC shall be the date reckoning from the date of “Completion Certificate” as per Clause 19.1 of SCC.

22.4 Payment for AMC shall be released for each year on successful completion of AMC period on yearly basis as per the lump sum price agreed in this Contract (BOQ) against certification of Engineer-in-charge of the assets.

22.5 The scope of AMC, in addition to the prescribed Technical Specifications (TS), shall generally cover both short & long term preventive maintenance, defect removal, repair, replacement of Parts, Modules and restoration of the healthy operation of the systems and assets covered in this Package.

23.0 TRAINING AND HANDOVER

The Contractor shall place adequate trained technical manpower in the area for maintaining and training of the departmental staff for gradual take over of the project.

24.0 BOQ TO BE READ WITH TS SUBJECT TO GTP

The list of items given in the Bill of Quantities (BOQ) of this tender is only the indicative nomenclature of the tendered items and these items shall always be read with the Technical Specifications (TS) provided herein, subject to the Guaranteed Technical Particulars (GTP) if so provided by the bidder.

25.0 CONTRACT SECURITY

The Contract Performance Guarantee (CPG) as per Clause 41 of INB and the Security Against Mobilization Advance (SAMA), as per clause 34.7.1(a) of GCC shall be submitted in the manner described hereunder:-

1. Within the prescribed dateline, the original Fixed Deposit Receipt (FDR or STDR) of the specified amount, for minimum maturity period of 90
days, shall be submitted to enable signing of the contract agreement with the Owner.

2. The contractor can exercise an option to replace the FDR or STDR submitted as CPG with a Bank Guarantee (BG) in the prescribed format and text, given in the Annexure I to this document, duly issued by a Nationalized Bank, from any of the listed banks given in Appendix-2 to INB, having a branch in the state of Arunachal Pradesh. The contractor may submit the said BG simultaneously with the FDR or at any time during the contract period giving the Owner at least 30 days for verification and confirmation of the BG.

3. After receiving the original BG, the Owner, after verification and confirmation of the genuineness of the BG and after having satisfied with the progress and performance made towards accomplishment of the contracted activities during the preceding period of the contract, shall release the FDR or STDR to the contractor. The owner reserves the right to refuse this request or delay the release if he has reasons to contemplate any contractual in-security on the basis of his assessment at that point of time.

4. The Bid Guarantee or Earnest Money (EM) deposited in the form of FDR or STDR shall become part of the CPG in the FDR form only to be released along with the CPG as per provisions of this contract.

26.0 TENDER SPECIFIC DATA:- All tender specific information is available in Section entitles “Enclosures” to this document.

26.1 Instructions to Tender Preparing authorities:- The tender preparing officers shall evaluate and prepare the documentations to be enclosed, (as per prescribed specimen and guidelines provided therein) duly signed under their official seal and approval endorsements conveyed in case prior approval is required as per Rules & Codal provisions.

26.2 Instructions to the Bidders:- The bidders shall fully understand the contents of the “Enclosures” and prepare his/their bids on the basis of the information mentioned therein.

27.0 ABNORMAL IMBALANCE IN SUPPLY & ERECTION:- If the percentage of erection cost over the total bid price (Supplies, Erection, etc, all added) is found to be less than the percentage of erection cost prescribed in the tender as indicated at Enclosure-9 of SCC, the Owner reserves the right to ask the bidder to balance the price prior to acceptance and reject such offer if one fails to comply.

END OF SCC
GENERAL TECHNICAL CONDITIONS (GTC)

[(The EEs are to ensure that each of the items in the BOQ are provided with Technical Specifications (TS). Absence of TS in a tender will a void in the tender); whereas absence of GTP is not mandatory as it is optional to the bidder.]
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SECTION-GTC

GENERAL TECHNICAL CONDITIONS

1.0 GENERAL INFORMATION

The General Technical Conditions (GTC) is the broad technical conditions covering the entire scope of work under this contract. The conditions prescribed in GTC shall be the main domain of the technical conditions governing the contract. Technical Specifications (TS) prescribed are detailed and minute specifications which further qualify the GTC for each of the items for which TS are prescribed as baseline qualifying standards. The Contactor/bidders are given an opportunity to quote their Guaranteed Technical Particulars (GTP) if they offer a better specification, details of which are described hereunder.

2.0 SCOPE

2.1 The material/equipment to be supplied on final destination at site basis as covered in this volume of Part-III shall be designed, manufactured and tested as per the requirements specified.

Final Destination shall mean the stores established by the Contractor in the work site.

2.2 The materials/equipment covered here under this option shall be supplied complete in all respects, including all components, fittings and accessories which are necessary or are usual for their efficient performance and satisfactory maintenance under the various operating and atmospheric conditions. Such parts shall be deemed to be within the scope of the Contract, whether specifically included or not in the Specification or in the Contract Schedules. The Contractor shall not be eligible for any extra charges for such fittings etc.

The details of the materials/equipment required for the work have been elaborated in Schedules 3 & 4 of Part-III (Vol. 1/3) of the Bid document. Broad outline and objectives of the proposed work is described in Clause-2.0 of SCC of Part-III (Vol-1/3).

3.0 WEIGHTS AND MEASURES

All weights and measures shall be in System International (S.I.) units. All fasteners shall be of Metric size only.

4.0 GENERAL TECHNICAL CONDITIONS

4.1 The following provisions shall supplement all the detailed technical specifications and requirements brought out in the accompanying Technical Specifications. The Bidder’s proposal shall be based on the use of equipment and materials complying fully with the requirements, specified herein.

The Bidder shall furnish clause-by-clause commentary (with detailed technical data as required) on the Technical Specifications demonstrating the goods substantial responsiveness to the specifications or deviation and exceptions to the provisions of the Technical Specification unless and until advised contrary to this in the bidding document.
4.2 **Equipment Performance Guarantee**

4.2.1 The performance requirements of the items are detailed separately in this Specification. These guarantees shall supplement the general performance guarantee provisions covered under General Conditions of Contract in clause 15, entitled ‘Guarantee’.

4.2.2 Liquidated damages for not meeting specified performance shall be assessed and recovered from the Contractor. Such liquidated damages shall be without any limitation whatsoever and shall be in addition to damages, if any payable under any other clause of Conditions of Contract.

4.3 **Engineering Data**

4.3.1 The furnishing of engineering data by the Contractor shall be in accordance with the appropriate Schedule appended to this document. The review of these data by the Owner shall cover only general conformance of the data to the specifications and drawings. This review by the Owner 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 Owner 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.

4.3.2 All engineering data submitted by the Contractor after final process including review and approval by the Owner 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 owner in writing.

4.4 **Drawings**

4.4.1 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, dimensions, material description, Bill of Materials, weight of each component, break-up for packing and shipment, fixing arrangement required, the dimensions required for installation and any other information specifically requested in the Specifications.

4.4.2 Each drawing submitted by the Contractor shall be clearly marked with the name of the Purchaser, the unit designation, the Specification title, the Specification number and the name of the Project. All titles, notings, markings and in writings on the drawing shall be in English. All the dimensions should be to the scale and in metric units.

4.4.3 The drawings submitted by the Contractor shall be reviewed by the Owner as far as practicable within four (4) weeks and shall be modified by the Contractor if any modifications and/or corrections are required by the Owner in compliance with the Specifications. The Contractor shall incorporate such modifications and or corrections and submit the final drawings for approval. Any delays arising out of failure by the Contractor to rectify the drawings in good time shall not alter the Contract completion date.
4.4.4 The drawings submitted for approval to the Owner shall be in quadruplicate. One print of such drawings shall be returned to the Contractor by the Owner marked “Approved”/“Approved with corrections”. The Contractor shall thereupon furnish the Owner additional print as stipulated in Technical Specification along with one reproducible in original of the drawings after incorporating all corrections.

4.4.5 Further work by the Contractor shall be strictly in accordance with these drawings and no deviation shall be permitted without the written approval of the Purchaser, if so required.

4.4.6 All manufacturing and fabrication work in connection with the equipment/material 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 shall again be subject to approval by the Owner. Approval of Contractor’s drawing or work by the Owner shall not relieve the Contractor of any of his responsibilities and liabilities under the Contract.

4.4.7 All rights of the design/drawing shall be strictly reserved with the Owner only and any designs/drawings/data sheets submitted by the contractor from time to time shall become the property of the Owner. Under no circumstances, the Contractor shall be allowed to use/offer above designs/drawings/data sheets to any other authority without prior written permission of the Owner. Any deviation to above is not acceptable and may be a cause of rejection of the bid.

4.4.8 Design Co-ordination

Wherever, the design is in the scope of Contractor, the Contractor shall be responsible for the selection and design of appropriate material/item to provide the best co-coordinated performance of the entire system. The basic design requirements are detailed out in this Specification. The design of various components, sub-assemblies and assemblies shall be so done that it facilitates easy field assembly and maintenance.

4.5 Manufacturing Schedule

The Contractor shall submit to the Owner his manufacturing, testing and delivery schedules of various items within thirty (30) days from the date of the Letter of Award in accordance with the delivery requirements stipulated. Schedules shall also include the materials and items purchased from outside Contractors, if any.

4.6 Reference Standards

4.6.1 The Codes and/or Standards referred to in Specifications shall govern, in all cases wherever such references are made. In case of a conflict between such Codes and/or Standards and the specifications, latter shall govern. Such Codes and/or Standards, referred to shall mean the latest revisions, amendments/changes adopted and published by the relevant agencies.

4.6.2 Other internationally acceptable Standards which ensure equivalent or better performance than those specified shall also be accepted.
4.7 **Design Improvements**

4.7.1 The Owner or the Contractor may propose changes in the Specification of the equipment or quality thereof and if the parties agree upon any such changes, the Specification shall be modified accordingly.

4.7.2 If any such agreed upon change is such that it affects the price and schedule of completion, the parties shall agree in writing as to the extent of any change in the price and/or schedule of completion before the Contractor proceeds with the change. Following such agreement, the provision thereof, shall be deemed to have been amended accordingly.

4.8 **Quality Assurance**

4.8.1 To ensure that the equipment under the scope of this Contract whether manufactured within the Contractor’s Works or at his Sub-Contractor’s premises is in accordance with the specifications, the Contractor shall adopt suitable Quality Assurance Programme to control such activities at all points necessary.

Such program shall be outlined by the Contractor and shall be finally accepted by the Owner after discussions before the award of Contract. A Quality Assurance Programme of the Contractor shall generally cover but not limited to 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 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 including process controls.

(f) Control of non-conforming items and system for corrective action.

(g) Control of calibration and testing of measuring and testing equipments.

(h) Inspection and test procedure for manufacture.

(i) System for indication and appraisal of inspection status.

(j) System for quality audits.

(k) System for authorising release of manufactured product to the Purchaser.

(l) System for maintenance of records.

(m) System for handling storage and delivery and

(n) A Quality Plan detailing out the specific quality control procedure adopted for controlling the quality characteristics of the product.
The Quality Plan shall be mutually discussed and approved by the Owner after incorporating necessary corrections by the Contractor as may be required.

4.8.2 **Quality Assurance Documents**

The Contractor shall be required to submit all the Quality Assurance Documents as stipulated in the Quality Plan at the time of Owner’s inspection of equipment/material.

4.8.3 The owner or his duly authorised representatives reserves the right to carry out Quality Audit and Quality surveillance of the systems and procedures of the Contractor’s/his vendor’s Quality Management and Control Activities.

4.9 **Owner’s Supervision**

4.9.1 To eliminate delays and avoid disputes and litigation it is agreed between the parties to the Contract that all matters and questions shall be resolved in accordance with the provisions of this document.

4.9.2 The manufacturing of the product shall be carried out in accordance with the specifications. The scope of the duties of the Owner, pursuant to the contract, shall include but not be limited to the following:

(a) Interpretation of all the terms and conditions of these Documents and Specifications.

(b) Review and interpretation of all the Contractor’s drawings, engineering data etc.

(c) Witness or authorise his representative to witness tests at the manufacturer’s works or at site, or at any place where work is performed under the Contract.

(d) Inspect, accept or reject any equipment, material and work under the Contract, in accordance with the Specifications.

(e) Issue certificate of acceptance and/or progressive payment and final payment certificate.

(f) Review and suggest modification and improvement in completion schedules from time to time; and

(g) Supervise the Quality Assurance Programme implementation at all stages of the Works.

4.10 **Inspection, Testing & Inspection Certificate**

4.10.1 The Owner, his duly authorised representative and/or outside inspection agency acting on behalf of the Owner shall have at all reasonable times access to the Contractor’s premises or Works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the product during its manufacture and if part of the product is being manufactured or assembled at other premises or works, the Contractor shall obtain from the Owner and/or his duly authorised representative permission to inspect as if the equipment/materials were manufactured or assembled on the Contractor’s own premises or works.

4.10.2 The Contractor shall give the Owner or authorized representative or
inspecting agency 15 (fifteen) days written notice of any material being ready for testing. Such tests shall be to the Contractor’s account except for the expenses of the Inspector. The Owner or his authorized representative or inspecting agency unless witnessing of the tests is virtually waived, shall attend such tests within fifteen 15 (fifteen) days of the date of which the equipment is notified as being ready for test/inspection or on a mutually agreed date, failing which the Contractor may proceed with the test which shall be deemed to have been made in the owner or his authorized representative or inspecting agency's presence and he shall forthwith forward to the owner or his authorized representative or inspecting agency duly certified copies of tests in triplicate.

4.10.3 The Owner or his authorized representative or inspecting agency shall, within 15 (fifteen) 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 make the modifications that may be necessary to meet the said objections.

4.10.4 When the factory tests have been completed at the Contractor’s or Sub-Contractor’s works, the Purchaser Inspector shall issue a certificate to this effect within 15 (fifteen) days after completion of tests but if the tests are not witnessed by the Owner or his authorized representative or inspecting agency the certificate shall be issued within fifteen (15) days of receipt of the Contractor’s Test certificate by the Owner or his authorized representative or inspecting agency. The completion of these tests or the issue of the certificate shall not bind the Owner to accept the equipment should it, on further tests after erection, be found not to comply with the Contract.

4.10.5 In all cases where the Contract provides for tests whether at the premises or works of the Contractor or of any Sub-Contractor, the Contractor except where otherwise specified shall provide free of charge such item as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Owner or his authorized representative or inspecting agency to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Owner or to his authorised representative or inspecting agency to accomplish testing.

4.10.6 The inspection by Owner or his authorized representative or inspecting agency 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.

5.0 TECHNICAL SPECIFICATIONS (TS)

The technical description of various materials/equipment has been specified in the respective volumes of Technical Specifications (TS) or as may be amended by the owner. In absence of TS for some of the items in the BOQ, GTP shall be followed if furnished by the bidder and if not, Standard Specifications followed by PGCIL in EHV, REC for distribution works, or any other specifications of CEA or CBIP as the case may be for any other items.
6.0 TESTS AND STANDARDS

6.1 Tests
All equipments to be supplied under this package must have been type tested. The following acceptance and routine tests and tests during manufacture shall be carried-out on the material. For the purpose of this clause:

6.1.1 “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.

6.1.2 “Routine Tests” shall mean those tests, which are to be carried out on the material to check requirements, which are likely to vary during production.

6.1.3 “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 to be supplied by him.

6.1.4 The norms and procedure of sampling for these tests shall be as per the Quality Assurance Programme to be mutually agreed to by the Contractor and the Owner.

6.1.5 The standards and norms to which these tests shall be carried out are listed against them. Where a particular test is a specific requirement of this Specification, the norms and procedure of the test shall be as specified in a mutually agreed manner between the Contractor and the Owner in the Quality Assurance Programme.

6.1.6 For all acceptance tests, the acceptance values shall be the values specified in this Specification or guaranteed by the Bidder, as applicable.

The tests and standards for various materials/equipments have been specified in the respective volumes of technical specifications.

6.2 Testing Expenses
The entire cost of testing for the acceptance test and routine tests and tests during manufacture specified in the technical specifications for materials/equipment shall be treated as included in the quoted unit price except for the expenses of the Inspector/Owner’s representative.

6.3 Additional Tests
6.3.1 The Owner reserves the right of having at his own expenses any other test(s) of reasonable nature carried out at contractor’s premises, at site, or in any other place in addition to the specified type, acceptance and routine tests to satisfy himself that the materials/equipment comply with the Specifications.

6.3.2 The Owner also reserves the right to conduct all the tests mentioned in this specification at his own expense on the samples drawn from the site at Contractor’s premises or at any other test center. In case of evidence of non compliance, it shall be binding on the part of contractor to prove the compliance of the items to the technical specifications by repeat tests, or correction of deficiencies, or replacement of defective item all without any extra cost to the Owner.
7.0 GUARANTEED TECHNICAL PARTICULARS (GTP)

7.1 The Guaranteed Technical Particulars (GTP) of the various items shall be furnished by the Bidders, as optional obligation, in one original and Four (4) copies in the prescribed schedules of the Specifications. The Bidder shall also furnish any other schedule information as in his opinion is needed to give full description and details to judge the item(s) offered by him.

7.2 The data furnished in Guaranteed Technical Particulars should be the (minimum or maximum) better value (as per the requirement of the specification) required. A Bidder may guarantee a better value than the specification prescribed herein the TS. For testing purpose or from performance point of view, the material shall be considered performed successfully if it achieves the TS value or as guaranteed in the GTP whichever is better in case of any conflicts.

8.0 SERVICE CONDITIONS

All out door Equipment/material to be supplied against this specification shall be suitable for satisfactory continuous operation under tropical conditions as specified below:

1. Maximum ambient temperature (°C): 34
2. Minimum ambient temperature (°C): -15
3. Relative Humidity Range (%): 52.17 – 100%
4. Maximum wind velocity (Mtr./Sec.): 47
5. Maximum altitude above Mean Sea Level (Mtr.): 200 to 4500 (approx)
6. Isoceraunic level (Days/Year): 50
7. Moderately hot and humid tropical, climate, conducive to rust and fungus growth: Yes
8. Seismic Zone: Zone –V
9. Rainfall: above 1500 mm.
10. Transportation/accessibility: Hostile & Difficult

For indoor equipment/material the requirements are specified in the respective volumes of technical specification.

END OF GTC
PROFORMA
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PROFORMA OF BANK GUARANTEE FOR CONTRACT PERFORMANCE
(To be stamped in accordance with Stamp Act)

Bank Guarantee No. ..........................

Ref. ................................. Date ..........................

To
The Executive Engineer (E)
............... Electrical Division
“Owner”
............... – ..............

Dear Sir(s),

In consideration of Department of Power, Government of Arunachal Pradesh, (hereinafter referred to as the ‘Owner’ which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s .................., with its Registered/Head office at .................., (hereinafter referred to as the “Contractor” which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a Contract by issue of Owner’s Letter of Award No. ..............., Dated, ..............., and the same having been acknowledged by the Contractor, resulting in a Contract, bearing No. ............ Dated ..............., valued at Rs. ............ for Turn Key job of..........................................................................................................................

.......................................................................................................................... and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to 15% (Fifteen per cent) of the said value of the Contract to the Owner.

We .......................................................... (Name & Address of the Bank) having its Head Office at .......................... (hereinafter referred to as the ‘Bank’, which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner on demand any and all monies payable by the Contractor to the extent of ............... as aforesaid at any time up to ............... (days/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor without any undue delay.

Any such demand made by the owner on the Bank shall be conclusive and binding notwithstanding any difference between the Owner and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Owner and further agrees that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee.

The Owner shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Owner shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in
any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Owner and the Contractor or any other course or remedy or security available to the Owner. The Bank shall not be released of its obligations under these presents by any exercise by the Owner of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of omission or commission on the part of the Owner or any other indulgences shown by the Owner or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank.

The Bank also agrees that the Owner at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee, the Owner may have in relation to the Contractor’s liabilities.

Notwithstanding anything contained hereinabove, our liability under this guarantee is restricted to Rs.……….. and this guarantee is valid up to …………… and we shall be released and discharged from all liabilities hereunder unless a written claim within 90 days of the expiry of its validity, for payment under, or extension of, this guarantee is lodged on us irrespective of whether or not the original guarantee is returned to us.

Dated this ………… Day of ………………… 200……… at ……………………………

WITNESS

(Signature) (Signature)

(Name) (Name)

(Official Address) (Designation with Bank Stamp)

Attorney as per Power
of Attorney No. …………………
Date …………………

$$ The date will be ninety (90) days after the end of Warranty Period as specified in the Contract.

Note: The stamp papers of appropriate value shall be purchased in the name of issuing Bank.
PROFORMA OF EXTENSION OF BANK GUARANTEE
(To be stamped in accordance with Stamp Act)

Ref. ………………………………………………… Date ……………………………

To
The Executive Engineer (E)
……………… Electrical Division
“Owner”
……………… – …………..

Dear Sirs,

Sub: Extension of Bank Guarantee No. ……………… for Rs. …………….. favouring
yourselfs, expiring on ………………… on account of M/s. ……………… in respect of Contract No. ……………., Dated …………….. (hereinafter called
original Bank Guarantee).

At the request of M/s ………………… …… …., we ……..………………… Bank, branch
office at …………………  and having its Head Office at ……..…………………… 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 Bank Guarantee to which it would be
attached.

Yours Faithfully,

For ………………………………………
Manager/Agent/Accountant
Power of Attorney No. …………………
Dated, ………………………………………

SEAL OF BANK

Note: The non-judicial stamp paper of appropriate value shall be purchased in the name of the Bank which
has issued the Bank Guarantee.
To
The Executive Engineer (E)
............... Electrical Division
“Owner”
............... – .............

Dear Sir,

1. I*/We* have read and examined the following bid documents relating to the tender for the work:-

   a) Notices Inviting Tender

   b) Conditions of Contract (Non-IDA Supply-cum-Erection containing Sections Notice Inviting Tender (NIT)”, “Instructions to Bidders (INB)”, “General Terms & Conditions of Contract (GCC)” and “Erection Conditions of Contract (ECC)”).

   c) Special Conditions of Contract along with Annexure ............... to .................

   d) Drawing Nos. .................................................................................................

   e) Technical Specifications.

2. I*/We* hereby submit our Bid and undertake to keep our Bid valid for a period of six (6) calendar months from the date of bid i.e. up to ................. I*/We* hereby further undertake that during the said period I/We shall not vary/alter or revoke my/our Bid.
This undertaking is in consideration of Department of Power, Arunachal Pradesh agreeing to open my/our* Bid and consider and evaluate the same for the purpose of award of Work in terms of provisions of Clause entitled “Award of Contract”, Section INB, Conditions of Contract in the Bid Documents, Volume-1/3 of Part-III.

Should this Bid be accepted, *I/we* also agree to abide by and fulfill all the terms & conditions of provisions of the above mentioned bid documents.

Signature along with Seal of Company

.................................................................
(Duly authorized to sign the Bid on behalf of the Contractor)

Name: ...........................................................

Designation: ...................................................

Name of Company: ..........................
(in Block Letters)

WITNESS

Signature ..................... Date & Postal Address: ..............................................

Date: .................................

Name & Address: ...........................................................

Telephone No: ..............................................................

Fax No.: ..............................................................

*Strike out whichever is not applicable.
PROFORMA OF APPLICATION FOR PAYMENT

Project : 
Equipment package : Date :
Name of Contractor : Contract No. :
Contract Value : Contract Name:
Unit Reference : Application Serial number:

To
The Executive Engineer (E)
............... Electrical Division
“Owner”
............... – ..............

Dear Sir,

APPLICATION FOR PAYMENT

Pursuant to the above-referred Contract Dated ............., the undersigned hereby applies for payment of the sum of ............... (..........................)
(Specify amount and currency in which claim is made).

2. The above amount is on account of: [TICK (√) whichever is applicable]
   
   Initial advance (Schedule ....)
   Interim payment as advance (Schedule....)
   Progressive payment against dispatch of equipment (Schedule…)
   Progressive payment against receipt of equipment at site (Schedule…)
   Progressive payment against Erection (Schedule....)
   Ocean freight & marine insurance (Schedule....)
   Inland transportation (Schedule....)
   Inland insurance
   Price adjustment
   Extra work not specified in Contract
   (Ref. Contract change order No. ......................................................)
   Other (specify)
   Final payment (Schedule....)

as detailed in the attached Schedule(s) which form an integral part of this application.

3. The payment claimed is as per item(s) No.(s) ................. of the payment schedule annexed to the above-mentioned Contract.
4. The application consists of this page, a summary of claim statement (Schedule….), and the following signed schedule:

1. …………………………………………………………………………………………………
2. …………………………………………………………………………………………………
3. …………………………………………………………………………………………………

The following documents are also enclosed:

1. …………………………………………………………………………………………………
2. …………………………………………………………………………………………………
3. …………………………………………………………………………………………………

Signature of Contractor/
Authorized Signatory

Application for payment will be made to ‘Engineer’ to be designated for this purpose at the time of award of the Contract.

NB:-Proforma for the Schedules for claims will be mutually discussed and agreed to during the finalization of the Contract Agreement.
PROFORMA OF BANK GUARANTEE FOR ADVANCE PAYMENT
(To be stamped in accordance with Stamp Act)

Bank Guarantee No. ..........................

Ref. .......................... Date ..........................

To
The Executive Engineer (E)
....................... Electrical Division
“Owner”

Dear Sir,

In consideration of Department of Power (hereinafter referred to as the ‘Owner’, which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s ……………………… (hereinafter referred to as the “Contractor” which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns), a Contract by issue of Owner’s Letter of Award No. .........................., Dated ................., and the same having been acknowledged by the Contractor, resulting in a Contract bearing No. .........................., Dated ................., valued at Rs. .......................... for the turn key job of…………………………………………………………………………………………………
……………………………………………………
(hereinafter called the ‘Contract’) and the Owner having agreed to make an advance payment to the Contractor for performance of the above Contract amounting Rs. .......................... (Rupees………………………………….) as an advance against Bank Guarantee to be furnished by the Contractor.

We, .......................................................... (Name of the Bank) having its Head Office at ..........................................................(hereinafter referred to as the ‘Bank’, which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner, immediately on demand any, or all monies payable by the Contractor to the extent of ..........................as aforesaid at any time up to ......@...... without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Owner on the Bank shall be conclusive and binding notwithstanding any difference between the Owner and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the guarantee herein contained shall be irrevocable and shall continue to be enforceable till the Owner discharges this guarantee.

The Owner shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time, to vary the advance or to extend the time for performance of the Contract by the Contractor. The Owner shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Owner and the Contractor or any other course or remedy or security available to the Owner. The Bank shall not be released of its obligations under these presents by any exercise by the Owner of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Owner or any other
indulgence shown by the Owner or by any other matter or thing, whatsoever, which under law would, but for this provision have the effect of relieving the Bank.

The Bank also agrees that the Owner at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Owner may have in relation to the Contractor’s liabilities.

Notwithstanding anything contained hereinabove our liability under this guarantee is limited to ………… and it shall remain in force with auto-renewal facility, until the Owner demands for payment or releases this liability by returning the original guarantee with certification and endorsement for release.

Dated this ………. Day of …………. at………………………………………..

WITNESS

(Signature) ................................................ (Signature) ................................................

(Name) ................................................ (Name) ................................................

(Official Address) ................................................ (Designation) ................................................ (with Bank Stamp)

Attorney as per Power of Attorney No. …................................................

Dated, …................................................

@ The date will be ninety (90) days after the date of completion of the Contract.

Note: The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank, which issues the Bank Guarantee.
PROFORMA OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR EQUIPMENT HANDED OVER FOR PERFORMANCE OF ITS CONTRACT
(Entire Equipment(s) consignment in one lot)
(On non-Judicial stamp paper of appropriate Value)

INDEMNITY BOND

THIS INDEMNITY BOND is made this ............... day of .......... 200....... by .................................., a Company registered under the Companies Act, 1956/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 “Department of Power”, having its Registered Office at Vidyut Bhawan, 0-Point, Itanagar-791 111, Government of Arunachal Pradesh, (hereinafter called “Owner” which expression shall include its successors and assigns):

WHEREAS “Owner” has awarded to the Contractor a Contract for ............... vide its Letter of Award/Contract No. ................................. dated ....................... and its Amendment No. .......... (applicable when amendments have been issued) (hereinafter called the “Contract”) in terms of which “Owner” is required to hand over various equipment(s) to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No.7.2 of Section GCC of Part-I II (Vol. 1/3) of Bid document of the said Contract, the Contractor is required to execute an Indemnity Bond in favor of “Owner” for the Equipment handed over to it by “Owner” for the purpose of performance of the Contract/Erection portion of the Contract {hereinafter called the “Equipment(s)”’}.

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various equipment(s) as mentioned in the Contract, valued at Rs. ................ (Rupees ...........................................) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep “Owner” indemnified, for the full value of the Equipment(s). The Contractor hereby acknowledges receipt of the Equipment as per dispatch 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 dispatch title documents in respect of the said Equipment duly endorsed by “Owner” 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 “Owner”.

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment(s) at “Owner” Project Site against all risks, whatsoever, till the Equipment(s) 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 “Owner”. The Contractor undertakes to keep “Owner” harmless against any loss or damage that may be caused to the Equipment(s).

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 utilized 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 “Owner” is and shall remain the exclusive Owner/Owner of the Equipment(s) free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment shall at all times be open to inspection and checking by Engineer-in-Charge/Engineer or other employees/agents authorized by him in this regard. Further, “Owner” shall always be free at all times to take possession of the Equipment(s) in whatever form the Equipment(s) may be, if in its opinion the Equipment(s) are likely to be endangered, mis-utilised 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 direction of demand of “Owner” 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(s) or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Engineer-in-Charge/Engineer of “Owner” as to assessment of loss or damage to the Equipment(s) shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment(s) at its own cost and/or shall pay the amount of loss of “Owner” without demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to “Owner” 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 terms and conditions of this Bond to the satisfaction of “Owner”, 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 to the Indemnity Bond of Proforma-VI

<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 Attorney (authorised representative) as a token of receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR/GR No./ Date of Bill of Lading</td>
<td>Carrier</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For and on behalf of

M/s ..............................

WITNESS
1. 1. Signature ................................... Signature ......................................
   2. Name ....................................... Name ............................................
   3. Address .................................... Designation ......................................
       Authorised representative$

2. 1. Signature ..................................
   2. Name ........................................ (Common Seal in case of Company)
   3. Address ......................................

$ Indemnity Bonds are to be executed by the authorized 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.
PROFORMA OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR 
FOR THE EQUIPMENT(S) HANDED OVER IN INSTALMENTS FOR 
PERFORMANCE OF ITS CONTRACT 

(On non-judicial stamp paper of appropriate value) 

INDEMNITY BOND 

THIS INDEMNITY BOND is made this ................. day of ................. 200........ by ....................................., a Company registered under the Companies Act, 1956/Partnership Firm/Proprietory Concern having its Registered Office at ............................................................... (hereinafter called as ‘Contractor’ or ‘Obligor’ which expression shall include its successors and permitted assigns) in favour of *Department of Power*, having its Registered Office at Vidyut Bhawan, 0-Point, Itanagar-791 111, Government of Arunachal Pradesh, (hereinafter called “*Owner*” which expression shall include its successors and assigns). 

WHEREAS “*Owner*” has awarded to the Contractor a Contract for ......................... vide its Letter of Award/Contract No. ...................... ....., Dated ...................., and Amendment No. ………………. (applicable when amendments have been issued) (hereinafter called the ‘Contract’) in terms of which “*Owner*” is required to hand over various Equipment to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No. 7.2 of Section- GCC of Part-III (Vol. 1/3) of Bid documents of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of “*Owner*” for the Equipment(s) handed over to it by “*Owner*” for the purpose of performance of the Contract/Erection portion of the Contract {hereinafter called the ‘Equipment(s)’}.

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipment(s) as mentioned in the Contract, valued at Rs. ........................................... (Rupees .............................................. ....) to be handed over to the Contractor in instalments from time to time for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep “*Owner*” indemnified, for the full value of the Equipment(s). The Contractor hereby acknowledges receipt of the initial instalment of the equipments as per details in the Schedule appended hereto. Further, the Contractor agrees to acknowledge receipt of the subsequent instalments of the Equipment(s) as required by “*Owner*” 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 dispatch title documents in respect of the said Equipment(s) duly endorsed by “*Owner*” in favour of the Contractor shall be construed as handing over the Equipment(s) purported to be covered by such title documents and the Contractor shall hold such Equipment(s) in trust as a Trustee for and on behalf of “*Owner*”.

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at “*Owner*” project Site against all risks, whatsoever, till the Equipment(s) 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 “*Owner*”. The Contractor undertakes to keep “*Owner*” harmless against any loss or damage that maybe caused to the Equipment(s).

3. The Contractor undertakes that the Equipment(s) 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 “Owner” is and shall remain the exclusive Owner of the Equipment(s) free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment(s) shall at all times be open to inspection and checking by Engineer-in-Charge/Engineer or other employees/agents authorised by him in this regard. Further, “Owner” shall always be free at all times to take possession of the Equipment(s) in whatever form the Equipment(s) may be, if in its opinion the Equipment(s) are likely to be endangered, mis-utilised or converted to use 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 “Owner” 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(s) or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Engineer-in-Charge/Engineer of “Owner” as to assessment of loss or damage to the Equipment(s) shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment(s) at its own cost and/or shall pay the amount of loss to “Owner” without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to “Owner” 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 “Owner”, THEN 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 to the Proforma-VII

<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>
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<td></td>
<td>RR/GR No./Date of Bill of Lading</td>
<td>Carrier</td>
<td></td>
</tr>
</tbody>
</table>

(Please number subsequent schedules)

For and on behalf of

M/s ..........................................................

WITNESS

1. 1. Signature ........................................ Signature ........................................
2. 2. Name ........................................... Name ...........................................

Part-III (Vol. 1/3)  Section-Proforma
3. Address .............................................  Designation .............................................
   Authorised representative$

2. 1. Signature .....................................

2. Name .............................................  (Common Seal in case of Company)

3. Address .............................................

$ Indemnity Bonds are to be executed by the authorized 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.
PROFORMA OF 'AGREEMENT'  
(To be executed on non-judicial stamp paper of appropriate value)

This Agreement made this ....................... day of ...................... two thousand ........ between Department of Power, having its Registered Office at Vidyut Bhawan, 0-Point, Itanagar-791 111, Government of Arunachal Pradesh, (hereinafter called ““Owner””) which expression shall include its administrators, successors, executors and permitted assigns) of the one part and M/s ………………………., a company incorporated under the Companies Act, 1956, having its Registered Office at ............................................., [hereinafter referred to as the ‘Contractor’ or “X” (name of the Contracting Co.) which expression shall include its administrators, successors, executors and permitted assigns] of the other part.

WHEREAS “Owner” is desirous of executing a project of  “………………………………………………………………………………………………  ……………………………………………………………………………………………………” under sponsorship of ……………………  …………………  ………and invited bids for the above work against its NIT No. ……………………

AND WHEREAS ....... "X" .........who had participated in the said tender vide their offer No. ................., Dated ................. was negotiated with, selected and offered a Letter of Award(LOA) No……………………dated ……… for execution of the said project to the ....... "X" ......

AND WHEREAS ....... "X" .........has accepted the said LOA and submitted the Contract Performance Guarantee (CPG) in prescribed form vide. No. .................(FDR No)/ BG No……, accocunt No……., dated…….. Rs………………..(Rupees…………………..) issued from… (Bank Name & Address). , resulting into this contract.

NOW THEREFORE THIS DEED WITNESSETH AS UNDER:

1.0 Article

1.1 Award of Contract

The “Owner” has awarded the Contract to ........... "X" ........... for the work of  “………………………………………………………………………………………………” on the terms and conditions contained in its Letter of Award No. ..........................................., dated .............., and the documents referred to therein. The award has taken effect from aforesaid Letter of Award. The terms and expressions used in this Agreement shall have the same meaning as are assigned to them in the ‘Contract Documents’ referred to in the succeeding Article.

2.0 Contract Documents

2.1 The Contract shall be performed strictly as per the terms and conditions stipulated herein and in the following documents attached herewith (hereinafter referred to as “Contract Documents”).

i) “Owner”’s Bidding Documents in respect of NIT No…………………….. dated.................., issued vide its letter No.
All the aforesaid Contract Documents shall form an integral part of this Agreement, in so far as the same or any part conforms to the Bidding Documents (Part- I, II & III) and what has been specifically agreed to by the “Owner” in its Letter of Award. Any matter inconsistent therewith, contrary or repugnant thereto or any deviations taken by the Contractor in its Proposal (Vol. 1/3 of Part-III) but not agreed to specifically by the “Owner” in its Letter of Award shall be deemed to have been withdrawn by the Contractor. For the sake of brevity, this agreement along with its aforesaid Contract Documents shall be referred to as the ‘Agreement’.

3.0 Conditions & Covenants

3.1 The scope of Contract, Consideration, Terms of Payment, Price Adjustment, if any, Taxes wherever applicable, Insurance, Liquidated Damages, Performance Guarantee and all other terms and conditions are contained in “Owner”’s Letter of Award No. ........................, Dated ................., read in conjunction with other aforesaid Contract documents. The Contract shall be duly performed by the Contractor strictly and faithfully in accordance with the terms of the Agreement.

3.2 The scope of work shall also include supply and installation of all such items which are not specifically mentioned in the Contract documents, but which are needed for successful, efficient, safe & reliable operation of the equipment unless otherwise specifically excluded in the Specifications under ‘Exclusions’ or Letter of Award.

3.3 Time Schedule
3.3.1 Time is the essence of the Contract and schedules shall be strictly adhered to. ‘X’ shall perform the work in accordance with the agreed schedule as given in Bid Document Part-III(Vol-1/3).

3.4 Quality Plans

3.4.1 The Contractor is responsible for the proper execution of the Quality Plans enclosed in the Bid Document Part-III (Vol-1/3). The work beyond the Customer Inspection Points (CIP) will progress only with the “Owner”’s consent. The “Owner” will also undertake quality surveillance and quality audit of the Contractor’s/Sub-Contractor’s works, systems and procedures and quality control activities. The Contractor further agrees that any change in the Quality Plan will be made only with the Owner’s approval. The Contractor shall also perform all quality control activities, inspection and tests agreed with the “Owner” to demonstrate full compliance with the Contract requirements.

3.4.2 The Contractor also agrees to provide the “Owner” with the necessary access, facilities for carrying out inspection, quality audit and quality surveillance of Contractor’s and its Sub-Contractor’s Quality Assurance Systems and conduct of tests in the manufacturing facilities.

These shall include but not limited to the following:

i) Relevant Plant standards, ISS Tests procedures;

ii) Drawings and Designs of the items under the contract;

iii) Detailed audit/tests on Quality Assurance System for manufacturing activities;

iv) Detailed audit/tests on works done during and after the works are done or erections of the items at site.

v) Storage procedures, Safe custody of materials at site and adequacy of storage of items from weathering.

vi) Complete set of log sheets (blank) mentioned in the quality plan.

3.4.3 It is expressly agreed to by the Contractor that the quality tests and inspection by the Owner shall not in any way relieve the Contractor of its responsibilities for quality standards, and performance guarantee and their other obligations under the Agreement.

3.4.4 ‘X’ agrees to submit Quality Assurance Documents package to “Owner” for review and record after completion and within three weeks of dispatch of material.

The package will include the following:

i) Factory test result/inspection reports for testing required by this Contract or applicable codes and standards;

ii) Two copies of inspection reports duly signed by Quality Assurance personnel of both “Owner” and ‘X’ for the agreed Customer Inspection Points;

iii) Report of the rectification works where and if applicable.

3.5 It is expressly agreed to by the Contractor that notwithstanding the fact that the Contract is termed as Turn-Key Contract, where both Supply and Erection upto commissioning are on single source responsibility basis and the Contractor is bound to perform the total Contract in its entirety and non-performance of any part or portion of the Contract such as lacking in erection work, shall be deemed to be a breach of the entire Contract, which shall enable the “Owner” to temporarily withhold payment towards supplies made.
3.6 The Contractor guarantees that the equipment supplied under the Contract shall meet the ratings and performance parameters as stipulated in the Technical Specifications (Volume–3/3 of Part-III) and in the event of any deficiencies found in the requisite performance figures, the “Owner” may at its option reject the equipment package or alternatively accept it on the terms and conditions and subject to levy of the liquidated damages in terms of Contract documents. The amount of liquidated damages so leviable shall be in accordance with the Contract Documents.

3.7 It is further agreed by the Contractor that the Contract Performance Guarantee shall in no way be construed to limit or restrict the “Owner”’s right to recover the damages/compensation due to short-fall in the equipment performance figures as stated in para 3.6 above or under any other clause of the Agreement. The amount of damages/compensation shall be recoverable either by way of deductions from the Contract price, Contract Performance Guarantee or other means as per law.

The Contract Performance Guarantee furnished by the Contractor is irrevocable and unconditional and the “Owner” shall have the powers to invoke it notwithstanding any dispute or difference between the Owner and the Contractor pending before any court tribunal, arbitrator or any other authority.

3.8 This Agreement constitutes full and complete understanding between the parties and terms of the presents. Any modification of the Agreement shall be effected only by a written instrument signed by the authorised representative of both the parties.

4.0 SETTLEMENT OF DISPUTES

It is specifically agreed by and between the parties that all the differences or disputes arising out of the Agreement or touching the subject matter of the Agreement shall be decided by the process of Settlement & Arbitration as specified in Clause 7, 8, 47 and 48 of the General Conditions of Contract (GCC) and the provisions of the Indian Arbitration Act, 1940 and amendments thereafter, shall apply. The Permanent Bench of Guwahati High Court at Itanagar alone shall have exclusive jurisdiction over the same.

5.0 Notice of Default

Notice of default given by either party to the other party under Agreement shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto if delivered against acknowledgment or by telex or by registered mail with acknowledgment due addressed to the signatories at the addresses mentioned herein.

IN WITNESS WHEREOF, the parties through their duly authorised representatives have executed these presents (execution whereof has been approved by the competent authorities of both the parties) on the day, month and year first above mentioned at Itanagar.

( Signature of “X”)                                           (Signature of “Owner”)
(Printed Name)                                         (Printed Name)
**WITNESS:**

<table>
<thead>
<tr>
<th>Contractor’s</th>
<th>Owner’s side</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>2</td>
</tr>
</tbody>
</table>
To
The Executive Engineer (Elect)
................ Electrical Division
................

Subject: Acceptance of Award

Reference: Your LOA No:………………………….

Sir,

With reference to your LOA no……….. Cited above we acknowledge the receipt of the said LOA. Having carefully studied and clear understanding of the details and contents of the award we do hereby accept the Award as required under clause 43 of section INB. Accordingly we have signed, sealed and dated the copy of LOA and is being enclosed herewith for further necessary action.

In accordance with clause 40.0 and 43.0 of Section INB we shall perform the following events as per schedule prescribed as follows:

1. Submission of Contract performance Guarantee: Please specify date
   (Within 30 days from date of LOA issue)
2. Signing of Agreement( (within 45 days of LOA) : Please specify date

In case if you find any of the above dates unsuitable please inform us accordingly.

Yours faithfully

END OF PROFORMA
ENCLOSURES
## CONTENTS

<table>
<thead>
<tr>
<th>Annexure</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Enclosure-1 (Experience of Similar Works for (QR)</td>
<td>121</td>
</tr>
<tr>
<td>II</td>
<td>Enclosure-2 (Additional Affidavit) ref. cl 11 of QR</td>
<td>122</td>
</tr>
<tr>
<td>III</td>
<td>Enclosure-3 Press Notice</td>
<td>123</td>
</tr>
<tr>
<td>IV</td>
<td>Enclosure-4 manual NIT or e-NIT</td>
<td>124-127</td>
</tr>
<tr>
<td>V</td>
<td>Enclosure-5 Broad outline on scope of work</td>
<td>128</td>
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<tr>
<td>VI</td>
<td>Enclosure-6 Work plan and Schedule</td>
<td>129</td>
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<tr>
<td>VII</td>
<td>Enclosure-7 Establishment of site offices</td>
<td>130</td>
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<td>VIII</td>
<td>Enclosure-8 Additional definitions on Commmng&amp; compln</td>
<td>131</td>
</tr>
<tr>
<td>IX</td>
<td>Enclosure-9 Tender Specific Data</td>
<td>132</td>
</tr>
</tbody>
</table>
Refer to Clause 2.0 of QR.

EXPERIENCE OF SIMILAR WORKS:- The minimum qualifying requirement for completed work experience on each of the types of work in aggregate shall be prescribed for each of the packages as per clause-2 of the QR Part-II. (To be segregated, defined, quantified and fixed a higher limit by the competent authority for each package/tender as appropriate and list them at Enclosure-1, at Section Enclosures SCC, ref cl 26 of SCC)

(i) the bidder must have successfully executed at least (details of similar works…) ……………………………during the last 10 (ten) years as on the date of Bid opening and which must be in satisfactory operation for at least 2 (two) years as on the date of Bid opening.

AND/OR (use only one as appropriate)

(ii) the bidder must have successfully DESIGNED/MANUFACTURED/ SUPPLIED/INTEGRATED ……………………………during the last 10 (ten) years as on the date of Bid opening and which must be in satisfactory operation for at least 2 (two) years as on the date of bid opening.

AND/OR

(iii) The bidder must have successfully……………………………………………………

………………………………………………………………………………

The Executive Engineer (E)

………………..Division

…………………………

Approved by:-
Refer clause 11 of QR

All additional affidavits required under clause 11 of the QR shall be listed hereunder:-

a) ……..( Any other issues of importance, EE may add subject to approval of the competent technical authority to approve this tender)…..

b) ……..( The special design requirements/conditions of the apparatus/equipments/fittings which are not expressly described in the TS or the GTP to be enlisted in this by the EE subject to approval of the competent technical authority to approve this tender)…..

The Executive Engineer (E)

……………………Division

…………………………..Approved by:-
Refer section Notice Inviting Tender of Part-III(Vol-1/3) Enclosure-3
(Ref. cl 26 of SCC)

GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF THE EXECUTIVE ENGINEER (ELECT) ..................... DIVISION, .........
DEPARTMENT OF POWER

[As per specimen e-NIT]

Sd/-
The Executive Engineer (E)

(Only to publish the contents between the margin at top and bottom margin lines)

Copy to:-
1) PPS to HCM for information to the Hon’ble Chief Minister.
2) PS to HMP, for information to the Hon’ble Minister (Power).
3) The Hon’ble Parliamentary Secretary (Power), for information
4) PS to Chief Secretary, Govt. of AP, .................., for information.
5) The Secretary (Power), Govt. of AP, .................., for information.
6) The Chief Engineer (Power), TPM Zone, Eastern, Western, & Central Electrical Zone,
7) All Superintending Engineers, Department of Power, Arunachal Pradesh.
8) All Executive Engineers, Deptt. of Power, Arunachal Pradesh.
9) The Director of Information & Public Relations, Naharlagun, with a request to get the
   enclosed Press Notice (NIT) published in any English papers of two(2) national dailies, any
   one of regional papers published from Guwahati and any two of local dailies published from
   Itanagar/Naharlogun on or before ......th ...... 20....
10) Notice Board
11) I. T. Section, O/o the CE(P), TP&M, for uploading of the NIT & other tender documents on
    or before ......th ...... 20....

The Executive Engineer (E)
................................. Division
Department of Power
............. 79.....
GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF THE EXECUTIVE ENGINEER (ELECT) ……………... ELECTRICAL
DIVISION,……………….. DEPARTMENT OF POWER

[ As per specimen NIT, see section NIT of part-III]

The Executive Engineer
(E)
…………………….Division
Department of Power
……………….….. 79…….

No._____________________                 Dtd.______ __

Copy to:-
1. PPS to HCM for information to the Hon'ble Chief Minister.
2. PS to HMP, for information to the Hon’ble Minister (Power).
3. The Hon’ble Parliamentary Secretary (Power), for information
4. PS to Chief Secretary, Govt. of AP, ...................., for information.
5. The Secretary (Power), Govt. of AP, ...................., for information.
6. The Chief Engineer (Power), TPM Zone, Eastern, Western, & Central Zone, ....................
7. All Superintending Engineers, Department of Power, Arunachal Pradesh.
8. All Executive Engineers, Deptt. of Power, Arunachal Pradesh.
9. The Director of Information & Public Relations, Naharlagun, with a request to get the enclosed Press Notice (NIT) published as per request made therein.
10. Notice Board
11. I.T. Section, O/o the CE(P), TP&M, for uploading of the NIT & other tender documents.

The Executive Engineer (E)
............................ Division
Department of Power
.....................- 79......
GOVERNMENT OF ARUNACHAL PRADESH
OFFICE OF THE EXECUTIVE ENGINEER (ELECT) ................. ELECTRICAL
DIVISION .................
DEPARTMENT OF POWER

No. _________________________________             Dtd.________

[ As per specimen e-NIT, see Section NIT, Part-III]

The Executive Engineer
(E)
..............................Division
Department of Power
..............................- 79.......
1. PPS to HCM for information to the Hon'ble Chief Minister.
2. PS to HMP, for information to the Hon'ble Minister (Power).
3. The Hon'ble Parliamentary Secretary (Power), for information
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5. The Secretary (Power), Govt. of AP, ................., for information.
6. The Chief Engineer (Power), TPM Zone, Eastern, Western, & Central Zone, .................
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11. I.T. Section, O/o the CE(P), TP&M, for uploading of the NIT & other tender documents.

The Executive Engineer (E)
......................... Division
Department of Power
.........................- 79......
BROAD OUTLINE ON SCOPE OF WORK:-

(The tender preparing authority shall make a broad outline of the scope of the proposed work under this tender. The work description shall be in one or two pages, containing the objectives, scopes included, excluded etc.).
WORK PLAN AND TIME SCHEDULE:-

The time period required is with reference to initial time i.e after signing of agreement but all must be phased to complete the entire project within …… months. The bidders are to depict each of the following milestones in the PERT.

<table>
<thead>
<tr>
<th>Milestone Activities</th>
<th>Time Period from the date of signing of Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Setting up of Office and Store at …………</td>
<td>…. Month</td>
</tr>
<tr>
<td>B Detailed survey, Design and Propose Deviation of Quantity</td>
<td>……Months</td>
</tr>
<tr>
<td>C Placement of order by the Contractor to the approved vendors.</td>
<td>…. Month</td>
</tr>
<tr>
<td>D Testing of equipments at manufacturer’s premises and dispatch of materials.</td>
<td>…… Months</td>
</tr>
<tr>
<td>E Installation, Commissioning……………………</td>
<td>…… Months</td>
</tr>
<tr>
<td>H User Acceptance Testing</td>
<td>…… Months</td>
</tr>
<tr>
<td>I Maintenance of the System For Five years after commissioning)</td>
<td>……… Months</td>
</tr>
</tbody>
</table>
ESTABLISHMENT OF PROJECT OFFICE

17.1 It shall be mandatory for the contractor to establish project offices at following locations:

i. Site office in Divisional HQ at ………………within …..days of Award.

ii. Project Office at ………………….. within …. months of Award

iii. Project Office in ………………..within …… months of Award.

The Executive Engineer (E)  
……………………Division  
…………………………

Approved by:-
Refer Cl.18 of section SCC of Part-III(Vol-1/3)  Enclosure-8  
(Ref. cl 26 of SCC)

ADDITIONAL DEFINITION OF COMMISSIONING & COMPLETION OF WORKS

( the owner may further elaborate and define the meanings of commissioning of some or few specific items or components in addition to above, as may be required necessary, in the following additional paragraphs )

The Executive Engineer (E)


Approved by:-
### TENDER SPECIFIC DATA

**Name of work:**  

**Package No. 1:**
- 1. Estimated Cost put to tender (Approved D-NIT) **Rs.**
- 2. Estimated percentage of erection cost (Cl-27 of SCC)  **…%**
- 3. Earnest Money or Bid guarantee amount (NIT) **Rs.**
- 4. Minimum Liquid Asset required (Cl 6 of QR) **Rs.**
- 5. Minimum required Turn-Over (Cl 5 of QR) **Rs.**
- 6. e-Tender Evaluation & Processing fee (Cl.3 of INB) **Rs.5000/-**
- 7. m-Tender Evaluation & Processing fee (Cl.3 of INB) **Rs.10000/-**
- 8. Number of years of AMC if it is made inclusive  **….Years**

**Package No. 2:**
- 1. Estimated Cost put to tender (Approved D-NIT) **Rs.**
- 2. Estimated percentage of erection cost (Cl 27 of SCC)  **…%**
- 3. Earnest Money or Bid guarantee amount (NIT) **Rs.**
- 4. Minimum Liquid Asset required (Cl 6 of QR) **Rs.**
- 5. Minimum required Turn-Over (Cl 5 of QR) **Rs.**
- 6. e-Tender Evaluation & Processing fee (Cl.3 of INB) **Rs.5000/-**
- 7. m-Tender Evaluation & Processing fee (Cl.3 of INB) **Rs.10000/-**
- 8. Number of years of AMC if it is made inclusive  **….Years**

---

**The Executive Engineer (E)**  

………………..Division  

…………………………

Approved by:-
SCHEDULES
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Page No.</th>
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<tr>
<td>1</td>
<td>Schedule-1  (Summary Price Proposal)</td>
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<td>Schedule-2  (Summary Price Components)</td>
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<td>Schedule-3  (Abstract of Bid components)</td>
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<td>4</td>
<td>Schedule-4  BOQ, (Item-wise bids )</td>
<td>138-</td>
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</table>
Dear Sirs,

We declare that in terms of Clause 13.0, Section-INB, Part-III (Vol. 1/3) of Bidding Documents, the following are our bid price for the entire scope of work as specified in the Specifications and the Bidding Documents.

A. Bid Price for Goods or Supplies (before State Sales Tax ie VAT or Entry Tax):

Rs. ................... (Rupees ..........................................................)

[Summary price component of the bid price are given in Schedule-2 (E)]

B. Applicable State Sales Tax or VAT and other state levies, payable additionally, in respect of the transaction between Owner and ourselves, if the Contract is awarded to us:

1. VAT or Entry Tax................................. estimated @ ...............
2. Local Cess if any ......................... estimated @ ...............
3. Other state levies if any:
   (i) ........................................... . estimated @ ...............
   (ii) ........................................... estimated @ ...............
   (iii) ................................. estimated @ ...............

4. Total State Levies (1+2+3): .................................................................

[Item wise break up of above is indicated in Schedules-3 & 4]

C. Bid Price for Erection and Services;

Rs……………….(Rupees…………………………………………………………...) ; which is inclusive of the following:-

D. Service Tax ......................... estimated @ ...............

E. Total Bid Price including Taxes & Duties and other levies, if the Contract is awarded to us i.e., sum of A+B+C+D above Rs. ................. (Rupees .................).

Date : (Signature) ...........................................

Place : (Printed Name) ...........................................

(Designation) .............................................

(Common Seal) ...........................................
### Summary Price Components

**Bidder's Name & Address**

To
The Executive Engineer (E)
Electrical Division
Department of Power
- 79...

---

**Summary of Price Component as per the scope identified in accompanying specifications:**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Amount (Rs.)</th>
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<tbody>
<tr>
<td>A.</td>
<td>Total Bid Price of Supplies including Taxes &amp; other levies</td>
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<td>B.</td>
<td>Total Erection Charges (including taxes &amp; other levies)</td>
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<td>C.</td>
<td>Total bid price = A + B</td>
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In Figure:

In Words: (Rupees....)
Schedule-3

ABSTRACT OF BILL OF QUANTITIES

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Description of Sub-Heads of Work</th>
<th>Total Price before VAT</th>
<th>VAT or Entry Tax (State Sales Tax)</th>
<th>Total Price after VAT (State sales Tax)</th>
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GRAND TOTAL COST OF SUPPLY & ERECTION:  Rs.  0.00

Say Rs. (Rupees only)
<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Description of items</th>
<th>Unit</th>
<th>Qty</th>
<th>Unit Price before VAT</th>
<th>Total Price before VAT (=col 4* col 5)</th>
<th>VAT or Entry Tax (State Sales Tax)</th>
<th>Total Price after VAT/Entry Tax (or State Sales Tax) (=col.6+col.7)</th>
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GRAND TOTAL COST OF SUPPLY & ERECTION: Rs. 0.00

(Rupees only)
PART-III
(Vol-2/3)

GUARANTEED TECHNICAL PARTICULARS
(GTP)

[ GTP formats are to be prepared by the EEs as per Technical Specifications prescribed in the tender for each of the items. GTP for most common items used by the Department are maintained, standardized and updated in the IT cell of the CE(P) T.P&M Zone which can be availed by the authorized officers of the Dept. on request. ]

NB:- Fixing of Guaranteed Technical Particulars for each new item, to which standard specifications are absent, shall require prior approval of competent authority who is competent to sanction that project.
GUARANTEED TECHNICAL PARTICULARS (GTP)

CONTENTS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Items</th>
<th>Page No.</th>
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<tbody>
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<td>Cover page</td>
<td>1</td>
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<tr>
<td>2.</td>
<td>Contents</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Sample (GTP for Transformer )</td>
<td>3-8</td>
</tr>
</tbody>
</table>
TRANSFORMER

1. Manufacturer’s Name & Address
2. Rating (MVA)
3. Voltage ratio (kV)
4. Winding connection
5. Vector group
6. Number of phases
7. Frequency (Hz)
8. Type of cooling
9. Rating available at different cooling (%)
10. Impedance Data
   a) Positive sequence impedance between HV-LV at 75º C with 100% rating at
      i) Principal tap
      ii) Maximum tap
      iii) Minimum tap
   b) Zero sequence impedance at principal tap
11. Guaranteed losses
   a) Maximum no load loss on principal tap at rated voltage and frequency (KW)
   b) Maximum load loss at rated current at principal tap at 75º C (KW)
   c) Maximum cooler loss (KW)
12. Cooling Equipment Details
   a) Number of radiator bank and its rating as % of transformer cooling
   b) Type of mounting
   c) Material
   d) Thickness
13. Thermal Data
   a) Temperature rise in top oil over an ambient of 50º C (ºC)
   b) Temperature rise in winding by resistance measurement method over an ambient of 50º C. (ºC)
   c) Thermal time constant (Hours)
14. Withstand time for three phase short circuit at terminals (secs.)
15. **Over excitation withstand time (secs.)**
   i) 125%  
   ii) 140%  
   iii) 150%

16. **Bushings**
   a) High Voltage  
      i) Manufacturer  
      ii) Type  
      iii) Total creepage distance (mm)  
      iv) Protected creepage distance (mm)  
      v) Mounting  
      vi) Rated current (Amps)
   b) Low Voltage  
      i) Manufacturer  
      ii) Type  
      iii) Total creepage distance (mm)  
      iv) Protected creepage distance (mm)  
      v) Mounting  
      vi) Rated current (Amps)

17. **Proposed method of transformer transportation**

18. **Tap changing Equipment rating**
   a) Voltage class & current  
   b) Number of steps  
   c) Range  
   d) Step voltage  
   e) Type  
   f) Rated voltage of drive motor (volts)  
   g) No. of revolutions to complete one step  
   h) Time to complete one step on manual/auto operation (secs.)  
   i) Power required (kW)

19. **Insulation Level**
   a) HV Winding  
      i) Lightning impulse withstand voltage (kVp)  
      ii) Switching Surge withstand voltage (kVp)  
      iii) Power Frequency withstand voltage (kV rms)
b) LV Winding
   i) Lightning impulse withstand voltage (kVp)
   ii) Power Frequency withstand voltage (kV rms)

c) HV Bushings
   i) Lightning impulse withstand voltage (kVp)
   ii) Switching Surge withstand voltage (kVp)
   iii) Power Frequency withstand voltage (kV rms)

d) LV Bushings
   i) Lightning impulse withstand voltage (kVp)
   ii) Power Frequency withstand voltage (kV rms)

e) Neutral Bushings
   i) Lightning impulse withstand voltage (kVp)
   ii) Power Frequency withstand voltage (kV rms)

20. **Approximate dimensions**
   a) Tank (lxbxh) (mm)
   b) Overall dimensions with coolers (lxbxh)
   c) Shipping dimensions (lxbxh)
   d) Height for un-tanking (mm)
   e) Dimensions of largest (mm) package (lxbxh)

21. **Weights of Transformer Components**
   a) Core (kg)
   b) Windings (Kg)
   c) Insulation (Kg)
   d) Tank and fittings (Kg)
   e) Oil (Kg)
   f) Untanking weight (heaviest piece) (Kg)
   g) Total weight (Kg)
   h) Weight of heaviest package (Kg)
   i) Total shipping weight (Kg)
   j) Parts detached for transport (furnish list)

22. **Permissible overload (% of rating and time)**

23. **Clearances**
   a) Minimum clearance between phases and phase to earth
      i) In oil (mm)
      ii) In air (mm)
   b) Minimum clearance of HV winding to tank in oil (mm)
c) Minimum clearance of HV winding of earth in oil (mm)
d) Clearance between Core and Coil (mm)
e) Clearance between coils (mm)
f) Clearance between neutral to ground in air (mm)

24. Conservator
   a) Total volume (Litres)
   b) Volume between highest and lowest levels (lits)

25. Capacitance Values
   a) HV to earth (pF)
   b) LV to earth (pF)

26. a) Type of oil preservation
   b) Material of air cell
   c) Continuous temp. withstand capability of the air cell

27. a) No. of pressure relief device provided
   b) Operating pressure of pressure relief device

28. Oil
   a) Quality of Oil

29. Core
   a) Type of construction (core/shell)
   b) Net core area (mm²)
   c) Core material and grade used
   d) Type of joint between core and yoke
   e) Thickness of stamping (mm)
   f) Percentage silicon content (%)
   g) Maximum flux density in core at rated frequency and at
      i) 90% voltage (wb/sq.m)
      ii) 100% voltage (wb/sq.m)
      iii) 110% voltage (wb/sq.m)

   b) Moisture Content (ppm)
   c) Max. tan-delta value (at 90º C.)
   d) Resistivity (ohm-cm)
   e) Breakdown Strength (kV)
   f) Interfacial tension at 20º C (min.)
   g) Standards applicable

   Before First Filling
   i) ------------------------
   ii) ------------------------
   iii) ------------------------
   iv) ------------------------
   v) ------------------------
   c) ------------------------
30. **Winding**
   a) Type of winding  
b) Current density at rated load  
i) HV (A/sq.mm)  
ii) LV (A/sq. mm)  
c) Conductor area  
i) HV (A/sq.mm)  
ii) LV (A/sq.mm)  
d) Maximum current density under short circuit  
i) HV (A/sq.mm)  
ii) LV (A/sq. mm)  
e) Magnetizing inrush current (Amps)  
f) No load current (Amps) at rated frequency and at  
i) 90% voltage (wb/sq.m)  
ii) 100% voltage (wb/sq.m)  
iii) 110% voltage (wb/sq.m)  
g) Magnetising current at rated frequency and at rated voltage  
h) Leakage reactance  
i) HV (ohms)  
j) LV (ohms)  
i) Leakage resistance  
i) HV (ohms)  
j) LV (ohms)

31. **Tank**
   a) Tank cover –Conventional/Bell Type  
b) Material  
c) Approximate thickness of  
i) Sides (mm)  
ii) Bottom (mm)  
iii) Cover (mm)

32. **Vacuum withstand capability of**
   a) Main tank (torr)  
b) Radiators and accessories (torr)

33. **Pressure withstanding capability of**
   a) Main tank (torr)  
b) Radiators and accessories (torr)
34. **Gasket**
   a) Material
   b) Temperature withstand capability (°C)

35. **Minimum draw bar pull required to move the transformer on level track (kg)**

36. **Size of filter hose (mm)**

37. **Temperature Indicators**
   a) OTI
      i) Manufacturer
      ii) Range
      iii) Accuracy
   b) WTI
      i) Manufacturer
      ii) Range
      iii) Accuracy
   c) RWTI
      i) Manufacturer
      ii) Range
      iii) Accuracy
      iv) Auxiliary supply used

*(Bidder’s Signature)*
GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF POWER
BID DOCUMENT

PART-III
(Volume-3/3)

TECHNICAL SPECIFICATIONS (TS)
FOR
(SUPPLY-CUM-ERECTION)
FOR

Name of work:-

UNDER

Sanction No. & ref:-

NIT No:-

ESTIMATED COST: Rs.

Seal & Sign of EE/SE
# PART-III
(VOL-3/3)

(……. NAME OF WORK….)

## LIST OF CONTENTS

( the EEs shall pick up the required technical specifications from the standard list, mark pages and fill the contents hereunder)

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</table>

NB:- Technical Specifications of items which are not available with any office shall make a reference to CE(P) T,PM Zone office. This office is constantly updating the latest available technology and standardizing the specifications from time to time.
TECHNICAL SPECIFICATION SHALL BE PREPARED BY THE TENDER PREPARING AUTHORITIES FOR EACH TENDER AND ATTACHED HEREUNDER:

TECHNICAL SPECIFICATIONS OF MOST OF THE ITEMS OF WORK ARE AVAILABLE IN THE OFFICE OF THE TPM ZONE FOR REFERENCE OF ALL CONCERNED.

The attached TS is only for showing it as part of the SBD as an example.
Technical Specification for 33/11kV Power Transformers
PART 1: GENERAL

1. SCOPE

This specification covers the design, engineering, manufacture, testing, supply, delivery, offloading and performance requirements of 33/11kV power transformers for use in the primary substations of the Discom’s namely NESCO, WESCO & SOUTHCO of Orissa. The transformers shall be double copper wound, three phase, oil immersed with ONAN cooling and fitted with on-load tap changers for 8.00 MVA Transformer only. The ratings required are 3.15 MVA, 5.0 MVA and 8.0 MVA.

The transformer shall conform in all respects to highest standards of engineering, design, workmanship, this specification and the latest revisions of relevant standards at the time of offer and the Purchaser shall have the power to reject any work or material, which, in his judgement, is not in full accordance therewith.

2. STANDARDS

Except where modified by this specification, the transformers shall be designed, manufactured and tested in accordance with the latest editions of the following standards. The Bidder may propose alternative standards, provided it is demonstrated that they give a degree of quality and performance equivalent to or better than the referenced standards. Acceptability of any alternative standard is at the discretion of the Purchaser. The Bidder shall furnish a copy of the alternative standard proposed along with the bid. If the alternative standard is in a language other than English, an English translation shall be submitted with the standard. In the case of conflict the order of precedence shall be
1) IEC or ISO Standards, 2) Indian Standards, 3) other alternative standards.

<table>
<thead>
<tr>
<th>IEC / ISO</th>
<th>Indian Standard</th>
<th>Subject</th>
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<tbody>
<tr>
<td>IEC 71</td>
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<td>Insulation co-ordination.</td>
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<td>IEC 76 (1 - 5)</td>
<td>2026</td>
<td>Power Transformers.</td>
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<td>IEC 137</td>
<td>2099</td>
<td>Bushings for Alternating Voltages above 1000 volts.</td>
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<td>IEC 214</td>
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<td>On-Load Tap Changers.</td>
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<td>IEC 296</td>
<td>335</td>
<td>Specification for unused mineral oils for transformers and switchgear.</td>
</tr>
<tr>
<td>IEC 354</td>
<td>6600</td>
<td>Loading Guide for oil immersed transformers.</td>
</tr>
<tr>
<td>IEC 437</td>
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<td>Radio Influence Voltage measurement.</td>
</tr>
<tr>
<td>IEC 518</td>
<td></td>
<td>Dimensional standardisation of terminals for high voltage switchgear and control gear.</td>
</tr>
<tr>
<td>IEC 529</td>
<td>2147</td>
<td>Degrees of protection provided by enclosures.</td>
</tr>
<tr>
<td>IEC 542</td>
<td></td>
<td>Application Guide for On-Load Tap Changers.</td>
</tr>
<tr>
<td>IEC / ISO</td>
<td>Indian Standard</td>
<td>Subject</td>
</tr>
<tr>
<td>IEC 551</td>
<td></td>
<td>Measurement of transformer and reactor sound levels.</td>
</tr>
</tbody>
</table>
3. SERVICE CONDITIONS

The service conditions shall be as follows:

- maximum altitude above sea level                           1,000 m
- maximum ambient air temperature                           50°C
- maximum daily average ambient air temperature             35°C
- minimum ambient air temperature                           0°C
- 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                                   150 cm
- maximum wind pressure                                      94.3 kg/m²

Environmentally, the region where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators.

Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

Indoor material and equipment shall be designed and protected for use in buildings, which occasionally may be wet and damp.
4. **SYSTEM CONDITIONS**

The equipment shall be suitable for installation in supply systems of the following characteristics:

- Frequency 50Hz
- Nominal system voltages
  - 33kV
  - 11kV
  - 400/230V
- Maximum system voltages:
  - 33kV System 36.3kV
  - 11kV System 12.1kV
  - LV System 476V
- Minimum LV voltage 340V
- Nominal short circuit levels:
  - 33kV System 25kA
  - 11kV System 12.5kA
- Insulation levels:
  1.2/50 ms impulse withstand (positive and negative polarity):
  - 33kV System 170kV
  - 11kV System 75kV
- Power frequency one minute withstand (wet and dry)
  - 33kV System 70kV
  - 11kV System 28kV
  - LV System 3kV
- Neutral earthing arrangements:
  - 33kV System solidly earthed
  - 11kV System solidly earthed
  - LV System solidly earthed

5. **COMPLIANCE WITH SPECIFICATION**

The transformers shall comply in all respects with the requirements of this specification. However, any minor departure from the provisions of the specification shall be disclosed at the time of tendering in the Non Compliance Schedule in Part 3 of this document.

The mass and dimensions of any item of equipment shall not exceed the figures stated in the Schedules.
6. COMPLIANCE WITH REGULATIONS

All the equipment shall comply in all respects with the Indian Regulations and acts in force. The equipment and connections shall be designed and arranged to minimise the risk of fire and any damage which might be caused in the event of fire.

7. QUALITY ASSURANCE, INSPECTION AND TESTING

7.1. General

To ensure that the supply and services under the scope of this contract, whether manufactured or performed within the Supplier’s works or at his sub-supplier’s premises or at any other place of work are in accordance with this specification, with the regulations and with relevant authorised International or Indian Standards, the Supplier shall adopt suitable quality assurance programmes and procedures to ensure that all activities are being controlled as necessary.

The quality assurance arrangements shall conform to the relevant requirements of ISO 9001 or ISO 9002 as appropriate.

The systems and procedures which the Supplier will use to ensure that the plant complies with the contract requirements shall be defined in the Supplier’s quality plan for the works.

The Supplier shall operate systems which implement the following:

Hold Point “A stage in the material procurement or workmanship process beyond which work shall not proceed without the documented approval of designated individuals or organisations.”

The Purchaser’s written approval is required to authorise work to progress beyond the Hold Points indicated in approved quality plans.

Notification Point “A stage in material procurement or workmanship process for which advance notice of the activity is required to facilitate witness.”

If the Purchaser does not attend after receiving documented notification in accordance with the agreed procedures and with the correct period of notice then work may proceed.

7.2. Quality Assurance Programme

Unless the Supplier’s quality assurance system has been audited and approved by the Purchaser, a Quality Assurance Programme for the Works shall be submitted to the Purchaser for approval a minimum of one month from contract award, or such other period as shall be agreed with the Purchaser. The Quality Assurance Programme shall give a description of the quality system for the works and shall, unless advised otherwise, include details of the following:

- The structure of the organisation
- The duties and responsibilities assigned to staff ensuring quality of work
- The system for purchasing, taking delivery and verification of materials
- The system for ensuring quality of workmanship
- The system for control of documentation
- The system for the retention of records
- The arrangements for the Supplier’s internal auditing
Technical Specification for 33/11kV Power Transformers (APDRP Scheme)

- A list of the administration and work procedures required to achieve and verify Contract’s quality requirements. These procedures shall be made readily available to the Purchaser for inspection on request.

7.3. Quality Plans

The Supplier shall draw up for each section of the work quality plans which shall be submitted to the Purchaser for approval at least two weeks prior to the commencement of work on the particular section. Each quality plan shall set out the activities in a logical sequence and, unless advised otherwise, shall include the following:

- An outline of the proposed work and programme sequence
- The structure of the Supplier’s organisation for the contract
- The duties and responsibilities assigned to staff ensuring quality of work for the contract
- Hold and notification points
- Submission of engineering documents required by the specification
- The inspection of materials and components on receipt
- Reference to the Supplier’s work procedures appropriate to each activity
- Inspection during fabrication/construction
- Final inspection and test

7.4. Non-conforming Product

The Purchaser shall retain responsibility for decisions regarding acceptance, modification or rejection of non-conforming items.

7.5. Sub-suppliers

The Supplier shall ensure that the quality assurance requirements of this specification are followed by any sub-suppliers appointed by him under the Contract.

The Supplier shall assess the sub-supplier’s quality assurance arrangements prior to his appointment to ensure compliance with the appropriate ISO 9000 standard and the specification. Auditing of the sub-supplier’s quality assurance arrangements shall be carried out by the Supplier and recorded in such a manner that demonstrates to the Purchaser the extent of the audits and their effectiveness.

7.6. Inspection and Testing

The Purchaser shall have free entry at all times, while work on the contract is being performed, to all parts of the manufacturer’s works which concern the processing of the equipment ordered. The manufacturer shall afford the Purchaser without charge, all reasonable facilities to assure that the equipment being furnished is in accordance with this specification.

The equipment shall successfully pass all the type tests and routine tests referred to in Clause 41, Part 2 and those listed in the most recent edition of the standards given in Clause 2, Part 1 of this specification.
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The Purchaser reserves the right to reject an item of equipment if the test results do not comply with the values specified or with the data given in the technical data schedule.

Type tests shall be carried out at an independent testing laboratory or be witnessed by a representative of such laboratory or some other representative acceptable to the Purchaser. Routine tests shall be carried out by the Supplier at no extra charge at the manufacturer's works.

Type tests may be dispensed with at the Purchaser's discretion if the Supplier furnishes evidence to the Purchaser's satisfaction that the relevant tests have already been performed on identical equipment. In this case test certificates shall be submitted with the bid for evaluation.

The Purchaser may witness routine and type tests. In order to facilitate this, the Supplier shall give the Purchaser a minimum of four weeks notice that the material is ready for testing. If the Purchaser does not indicate his intention to participate in the testing, the manufacturer may proceed with the tests and shall furnish the results thereof to the Purchaser.

Full details of the proposed methods of testing, including connection diagrams, shall be submitted to the Purchaser by the Supplier for approval, at least one month before testing.

All costs in connection with the testing, including any necessary re-testing, shall be borne by the Supplier who shall provide the Purchaser with all the test facilities which the latter may require, free of charge. The Purchaser shall have the right to select the samples for test and shall also have the right to assure that the testing apparatus is correct. Measuring apparatus for routine tests shall be calibrated at the expense of the Supplier at an approved laboratory and shall be approved by the Purchaser.

The Supplier shall be responsible for the proper testing of the plant or materials supplied by sub-suppliers to the same extent as if the work, plant or materials were completed or supplied by the Supplier.

Any cost incurred by the Purchaser in connection with inspection and re-testing as a result of failure of the equipment under test or damage during transport or offloading shall be to the account of the Supplier.

The Supplier shall submit to the Purchaser five signed copies of the test certificates, giving the results of the tests as required. No materials shall be dispatched until the test certificates have been received by the Purchaser and the Supplier has been informed that they are acceptable.

The test certificates must show the actual values obtained from the tests, in the units used in this specification, and not merely confirm that the requirements have been met. In the case of components for which specific type tests or routine tests are not given in Part 2, or in the quoted standards in Clause 2, of this specification, the Supplier shall include a list of the tests normally required for these components. All materials used in the Contract shall withstand and shall be certified to have satisfactorily passed such tests.

No inspection or lack of inspection or passing by the Purchaser's Representative of equipment or materials whether supplied by the Supplier or sub-supplier, shall relieve the Supplier from his liability to complete the contract works in accordance with the contract or exonerate him from any of his guarantees.

7.7. Guarantee

The Supplier shall guarantee the following:

- Quality and strength of materials used.
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- Satisfactory operation during the guarantee period of FIVE years from the date of commissioning, or 72 months from the date of acceptance of the equipment by the Purchaser following delivery, whichever is the earlier.
- Performance figures as supplied by the tenderer in the schedule of guaranteed particulars.

8. PROGRESS REPORTING

The Supplier shall submit for approval within 4 weeks of the starting date of the contract, an outline of production, inspection, delivery and erection chart. Within a further period of 4 weeks, the Supplier shall provide a detailed programme of the same information in the form to be agreed by the Purchaser. The Supplier shall submit two copies of monthly progress reports not later than the 7th day of the following month. The reports shall show clearly and accurately the position of all activities associated with the material procurement, manufacture, works tests and transport with regard to the agreed contract programme.

The preferred format for presentation of programmes is MS Project Version 4.0. Programmes and monthly updates should be submitted on 3.5” diskettes.

The design aspect of the progress report shall include a comprehensive statement on drawings, calculations and type test reports submitted for approval.

The position on material procurement shall give the dates and details of orders placed and indicate the delivery dates quoted by the manufacturer. If any delivery date has an adverse effect on the contract programme, the Supplier shall state the remedial action taken to ensure that delays do not occur.

The position on manufacture shall indicate the arrival of raw material and the progress of manufacture. Any events that may adversely affect completion in the manufacturer’s works shall also be reported.

All works tests executed shall be listed and test results shall be remarked upon. Any test failure shall be highlighted.

The dispatch of each order shall be monitored on the progress report giving the date by which the equipment will be available for transport, the estimated time of arrival on site and the dates actually achieved.

Delays or test failures in any part of the programme which may affect any milestone or final completion dates shall be detailed by the Supplier who shall state the action taken to effect contract completion in accordance with the contract programme.

9. SPARE PARTS AND SPECIAL TOOLS

The Supplier shall provide for every ten transformers the following mandatory spares:

- One HV Bushing,
- One LV Bushing,
- One complete set of bi-metallic connectors for bushings

The prices of mandatory spares will be taken into account in the evaluation of tenders.
The Bidder shall provide a list of recommended spare parts together with their individual prices. This list shall inter alia include a complete remote transformer control panel as specified in subclause 30.1 of this specification. This list shall identify all essential spares and consumable items for any recommended maintenance for a period of five years after commissioning.

The Purchaser may order all or any of the spare parts listed at the time of contract award and the spare parts so ordered shall be supplied as part of the definite works. The Purchaser may order additional spares at any time during the contract period at the rates stated in the contract document. A spare parts catalogue with price list shall be provided and this shall form part of the drawings and literature to be supplied.

The Bidder shall give an assurance that spare parts and consumable items will continue to be available through the life of the equipment, which shall be 25 years minimum. However, the Supplier shall give a minimum of 12 months notice in the event that the Supplier or any sub-suppliers plan to discontinue manufacture of any component used in this equipment.

Any spare apparatus, parts or tools shall be subject to the same specification, tests and conditions as similar material supplied under the definite work section of the contract. They shall be strictly interchangeable and suitable for use in place of the corresponding parts supplied with the plant and must be suitably marked and numbered for identification.

Spare parts shall be delivered suitably packed and treated for long periods in storage. Each pack shall be clearly and indelibly marked with its contents, including a designation number corresponding to the spare parts list in the operation and maintenance instructions.

A complete set of all the special tools, devices, slings or tackles required for the adjustment and maintenance of the equipment shall be supplied in the quantity listed in the Price Schedule. Each set of tools shall be mounted in a lockable cabinet. These shall also be provided under this contract. Eye bolts which have to be removed after use shall be accommodated in the cabinet.

10. PACKING AND SHIPPING

10.1. Packing

The equipment and any supporting structures are to be transported adequately sealed against water ingress. All accessories and spares shall be packed and securely clamped against movement in robust, wooden, non returnable packing cases to ensure safe transit in rough terrain, cross country road conditions and in heavy rains from the manufacturer's works to the work sites.

Equipment or material liable to deterioration by sea water, moisture, or ingress of foreign matter shall be totally sealed in strong polythene bags and those liable to deterioration due to condensation shall be protected by packs of silica gel or other approved desiccant.

All accessories shall be carefully packed so that they are fully protected during transport and handling operations and in storage. Internal surfaces of loose accessories shall be sealed by means of gaskets and blanking off plates. All parts liable to rust shall receive an anti-rusting coat and shall be suitably protected. It shall be the responsibility of the Supplier to make good any damage caused through insufficient packing.

Each packing case shall be indelibly marked, on two adjacent sides and on the top, with the following:
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- individual serial number;
- purchaser's name;
- contract number;
- destination;
- a colour coded marking to indicate destination;
- supplier's name;
- name and address of supplier's agent in Orissa;
- description and numbers of contents;
- manufacturer's name
- country of origin;
- case measurements;
- gross and net weights in kilograms: and
- all necessary slinging and stacking instructions.

Each crate or container shall be marked clearly on the outside of the case to show TOP and BOTTOM positions with appropriate signs to indicate where the mass is bearing and the correct positions for slings. All component parts which are separately transported shall have permanent identification marks to facilitate correct matching and assembly at site. Welded parts shall be marked before welding.

Six copies of each packing list shall be sent to the Purchaser prior to dispatching the equipment.

10.2. Shipping

The Supplier shall be responsible for the shipping of all plant and equipment supplied from abroad to the ports of entry and for the transport of all goods to the various specified destinations including customs clearance, offloading, warehousing and insurance.

The Supplier shall inform himself fully as to all relevant transport facilities and requirements and loading gauges and ensure that the equipment as packed for transport shall conform to these limitations. The Supplier shall also be responsible for verifying the access facilities specified.

The Supplier shall be responsible for the transportation of all loads associated with the contract works and shall take all reasonable steps to prevent any highways or bridges from being damaged by his traffic and shall select routes, choose and use vehicles and restrict and distribute loads so that the risk of damage shall be avoided. The Supplier shall immediately report to the Purchaser any claims made against the Supplier arising out of alleged damage to a highway or bridge.

All transport accessories, such as riding lugs, jacking pads or blanking off plates shall become the property of the Purchaser.

All items of equipment shall be securely clamped against movement to ensure safe transit from the manufacturer's facilities to the specified destinations.
The Supplier shall advise the storage requirements for any plant and equipment that may be delivered to the Purchaser's stores. The Supplier shall be required to accept responsibility for the advice given in so far as these arrangements may have a bearing on the behaviour of the equipment in subsequent service.

10.3. Hazardous substances

The Supplier shall submit safety data sheets for all hazardous substances used with the equipment. The Supplier shall give an assurance that there are no other substances classified as hazardous in the equipment supplied. No oil shall be supplied or used at any stage of manufacture or test without a certificate acceptable to the Purchaser that it has a PCB content of less than 2mg / kg. The Supplier shall accept responsibility for the disposal of such hazardous substances, should any be found.

The Supplier shall also be responsible for any injuries resulting from hazardous substances due to non-compliance with these requirements.

11. SUBMITTALS

11.1. Submittals required with the bid

The following shall be required with each copy of the bid:

- completed technical data schedule;
- descriptive literature giving full technical details of equipment offered;
- outline dimension drawing for each major component, general arrangement drawing showing component layout and general schematic diagrams;
- type test certificates, where available, and sample routine test reports;
- detailed reference list of customers already using equipment offered during the last 5 years with particular emphasis on units of similar design and rating;
- details of manufacturer's quality assurance standards and programme and ISO 9000 series or equivalent national certification;
- deviations from this specification. Only deviations approved in writing before award of contract shall be accepted;
- list of recommended spare parts and consumable items for five years of operation with prices and spare parts catalogue with price list for future requirements.

11.2. Submittals required after contract award

11.2.1. Programme

Five copies of the programme for production and testing.
11.2.2. Technical Particulars

Within 30 days of contract award five bound folders with records of the technical particulars relating to the equipment. Each folder shall contain the following information:

- general description of the equipment and all components, including brochures;
- technical data schedule, with approved revisions;
- calculations to substantiate choice of electrical, structural, mechanical component size/ratings;
- detailed dimension drawing for all components, general arrangement drawing showing detailed component layout and detailed schematic and wiring drawings for all components;
- detailed loading drawing to enable the Purchaser to design and construct foundations for the transformer;
- statement drawing attention to all exposed points in the equipment at which copper/aluminium or aluminium alloy parts are in contact with or in close proximity to other metals and stating clearly what protection is employed to prevent corrosion at each point;
- detailed installation and commissioning instructions;

At the final hold point for Purchaser approval prior to delivery of the equipment the following shall be submitted;

- inspection and test reports carried out in the manufacturer's works;
- operation and maintenance instructions as well as trouble shooting charts.

11.2.3. Operation and Maintenance instructions

A copy of installation and commissioning instructions and of the operation and maintenance instructions and trouble shooting charts shall be supplied with each transformer.

11.3. Drawings

Within 30 days of contract commencement the Supplier shall submit, for approval by the Purchaser, a schedule of the drawings to be produced detailing which are to be submitted for "Approval" and which are to be submitted "For Information Only". The schedule shall also provide a programme of drawing submission, for approval by the Purchaser, that ensures that all drawings and calculations are submitted within the period specified above.

All detail drawings submitted for approval shall be to scale not less than 1:20. All important dimensions shall be given and the material of which each part is to be constructed shall be indicated on the drawings. All documents and drawings shall be submitted in accordance with the provisions of this specification and shall become the property of the Purchaser.

All drawings and calculations, submitted to the Purchaser, shall be on international standard size paper, either A0, A1, A2, A3 or A4. All such drawings and calculations shall be provided with a contract title block, which shall include the name of the Purchaser and
Consultants and shall be assigned a unique project drawing number; the contract title block and project numbering system shall be agreed with the Purchaser.

Script sizes and thickness of scripts and lines be selected so that if reduced by two stages the alphanumeric characters and lines are still perfectly legible so as to facilitate microfilming.

For presentation of design drawings and circuit documents IEC Publication 617 or equivalent standards for graphical symbols are to be followed.

12. APPROVAL PROCEDURE

The Supplier shall submit all drawings, documents and type test reports for approval in sufficient time to permit modifications to be made if such are deemed necessary and re-submit them for approval without delaying the initial deliveries or completion of the contract work. The Purchaser's representative shall endeavour to return them within a period of four weeks from the date of receipt.

Three copies of all drawings shall be submitted for approval and three copies for any subsequent revision. The Purchaser reserves the right to request any further additional information that may be considered necessary in order to fully review the drawings. If the Purchaser is satisfied with the drawing, one copy will be returned to the Supplier marked with "Approved" stamp. If the Purchaser is not totally satisfied with the drawing, then "Approved Subject to Comment" status will be given to it and a comment sheet will be sent to the Supplier. If the drawing submitted does not comply with the requirements of the specification then it will be given "Not Approved" status and a comment sheet will be sent to the Supplier. In both these cases the Supplier will have to modify the drawing, update the revision column and resubmit for final Approval. Following approval, twenty copies of the final drawings will be required by the Purchaser.

Any drawing or document submitted for information only should be indicated as such by the Supplier. Drawings and documents submitted for information only will not be returned to the Supplier unless the Purchaser considers that such drawing needs to be approved, in which case they will be returned suitably stamped with comments.

The Supplier shall be responsible for any discrepancies or errors in or omissions from the drawings, whether such drawings have been approved or not by the Purchaser. Approval given by the Purchaser to any drawing shall not relieve the Supplier from his liability to complete contract works in accordance with this specification and the condition of contract nor exonerate him from any of his guarantees.

If the Supplier needs approval of any drawing within a period of less than four weeks in order to avoid delay in the completion of supply, he shall advise the Purchaser when submitting the drawings and provide an explanation of the document's late submission. The Purchaser will endeavour to comply with the Contractors timescale, but this cannot be guaranteed.

13. SURFACE TREATMENT

A full description of the corrosion prevention system proposed by the Bidder shall be given in the Schedule and this is subject to acceptance by the Purchaser. This description shall include details of surface preparation, rust inhibition, paint thickness, treatment of fasteners and painting of surfaces in contact with oil.
All machining, drilling, welding, engraving, scribing or other manufacturing activities which would damage the final surface treatment shall be completed before the specified surface treatment is carried out. Any subsequent damage occurring to the surface treatment up to the final delivery and offloading shall be made good by the Supplier.

13.1. Painting

All paints shall be applied on clean, dry surfaces under suitable atmospheric and other conditions in accordance with the paint manufacturer’s instructions. All paints used shall be compatible with each other and capable of being used as a system. The system shall be capable of performance for five years in the environment specified without any need for maintenance.

No consecutive coats of paint shall be of the same shade.

The minimum standards acceptable are:

- Cleaning by shot blasting to Grade Sa 2.5 of ISO 8501-1.
- All sheet steelwork shall be degreased, pickled and phosphated in accordance with IS 6005 - "Code of Practice for phosphating of iron and steel."
- All rough surfaces of coatings shall be filled with an approved two pack filler and rubbed down to a smooth finish.
- Interior surfaces of mechanism chambers, boxes and kiosks, after preparation, cleaning and priming shall be painted with one coat of zinc chromate primer, one coat of phenolic based undercoating, followed by one coat of phenolic based finishing paint to white colour followed by a final coat of anti-condensation white paint of a type and make to the approval of the Purchaser. A minimum overall paint film thickness of 150 microns shall be maintained throughout.
- Exterior steelwork and metalwork, after preparation and priming shall be painted with one coat of zinc chromate primer, one coat of phenolic based undercoating and two coats of micaceous iron oxide paint, then painted with a final coat of phenolic based hard gloss finishing paint of the Light Grey Shade No. 631 of IS 5, to provide an overall minimum paint thickness of 200 microns.

13.2. Galvanising

All galvanising shall be carried out by the hot dip process, in accordance with Specification ISO 1460 or IS 2629. However, high tensile steel nuts, bolts and spring washers shall be electro galvanised to service condition 4. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the galvanic bath which could have a detrimental effect on the durability of the zinc coating.

Before pickling, all welding, drilling, cutting, grinding etc. must be completed and all grease, paint, varnish, oil, welding slag etc. completely removed. All protuberances which would affect the life of galvanising shall also be removed.

The weight of zinc deposited shall be in accordance with that stated in standard BS 729, ISO1460 or IS2629 and shall be not less than 0.61 kg/sq. mtr with minimum thickness of 86 microns for items of thickness more than 5 mm, 0.46 kg/ sq. mtr. (64 microns) for items of
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thickness between 2 mm & 5 mm and 0.33 kg/sq. mtr (47 microns) for items less than 2 mm thick.

Parts shall not be galvanised if their shapes are such that the pickling solution cannot be removed with certainty or if galvanising would be unsatisfactory or if their mechanical strength would be reduced. Surfaces in contact with oil shall not be galvanised unless they are subsequently coated with an oil resistant varnish or paint.

In the event of damage to the galvanising the method used for repair shall be subject to the approval of the Purchaser or that of his representative.

Repair of galvanising on site will generally not be permitted.

The threads of all galvanised bolts and screwed rods shall be cleaned of spelter by spinning or brushing. A die shall not be used for cleaning the threads unless specifically approved by the Purchaser. All nuts shall be galvanised with the exception of the threads which shall be oiled.

Partial immersion of the work shall not be permitted and the galvanising tank must therefore be sufficiently large to permit galvanising to be carried out by one immersion.

After galvanising no drilling or welding shall be performed on the galvanised parts of the equipment excepting that nuts may be threaded after galvanising. To avoid the formation of white rust, galvanised material shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanisation.

The galvanised steel shall be subjected to test as per IS-2633.

14. FASTENERS

All bolts, nuts, screw threads, pipe threads, bolt heads and nuts shall comply with the appropriate Indian Standards for metric threads, or the technical equivalent.

Bolts or studs shall not be less than 6 mm in diameter except when used for small wiring terminals.

All nuts and pins shall be adequately locked.

Wherever possible bolts shall be fitted in such a manner that in the event of failure of locking resulting in the nuts working loose and falling off, the bolt will remain in position.

All ferrous bolts, nuts and washers placed in outdoor positions shall be treated to prevent corrosion by hot dip galvanising except high tensile steel bolts and spring washers which shall be electro-galvanised to service condition four. Appropriate precautions shall be taken to prevent electrolytic action between dissimilar metals.

Where bolts are used on external horizontal surfaces and where water can collect, methods of preventing the ingress of moisture to the threads shall be provided.

Each bolt or stud shall project at least one thread but not more than three threads through the nut, except when otherwise approved for terminal board studs or relay stems. If bolts and nuts are placed so that they are inaccessible by means of ordinary spanners, special spanners shall be provided.

The length of the screwed portion of the bolts shall be such that no screw thread may form part of a shear plane between members.

Taper washers shall be provided where necessary.
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Protective washers of suitable material shall be provided front and back on the securing screws.

15. **COMPLETENESS OF CONTRACT**

All fittings or accessories, although not specifically mentioned herein, but necessary or usual for similar equipment and their efficient performance shall be provided by the supplier without extra charges. The tender shall clearly indicate if any additional equipment or parts would be necessary to give a complete offer and if so, the details and the prices shall be included in the bid.

16. **PADLOCKS**

The Supplier shall provide padlockable handles and non-ferrous padlocks with duplicate keys for the local Transformer tap change control panel, mechanism box or kiosk doors to prevent all unauthorised access and operation.

17. **LABELS**

All apparatus shall be clearly labelled indicating, where necessary, its purpose and service positions.

The material of all labels and plates, their dimensions, legend and the method of printing shall be subject to approval of the Purchaser. The surfaces of all labels and plates shall have a mat or satin finish to avoid dazzle from reflected light.

Colours shall be permanent and free from fading. Labels mounted on black surfaces shall have white lettering. Danger plates shall have white lettering on a red background.

All labels and plates for outdoor use shall be of incorrodible material. Where the use of enamelled iron plates is approved, the whole surface including the back and edges, shall be properly covered and resistant to corrosion.

They shall be engraved in English. Name plates shall be white with black engraved lettering and shall carry all the applicable information specified in the applicable items of the Standards.

No scratching, corrections or changes will be allowed on name plates.

Name plates shall be provided of white background with black engraved lettering carrying all the applicable information specified in the standards and other details as required by the Purchaser. The name plate inscription and the size and lettering shall be submitted to the Purchaser for approval.

18. **OPERATIONAL TRAINING**

Not applicable.
PART 2: TECHNICAL

19. TYPE OF TRANSFORMER

The transformers shall be double copper wound, three phase, oil immersed, 33/11kV, 50 Hz with on-load tap-changer with 8.00 MVA Transformer only & off-load tap-changer for others mounted in the high voltage end.

The transformers shall be naturally cooled, Type ONAN.

20. RATED CAPACITY

The MVA ratings shall be 3.15 MVA, 5 MVA and 8 MVA based on natural cooling. Each transformer shall be capable of supplying its rated power continuously at all tap positions with rated voltage on the low voltage winding. The transformers shall also be capable of delivering rated current at an applied voltage equal to 105% of the rated voltage.

Each transformer shall be capable of supplying its rated power continuously under ambient temperature conditions without the temperature rise of the top oil exceeding 50°C and without the temperature rise of the windings as measured by resistance exceeding 55°C. The ambient temperature conditions are as follows:

- Maximum ambient temperature: 50°C
- Maximum daily average ambient temperature: 35°C
- Maximum yearly weighted average ambient temperature: 32°C

The transformer may be overloaded during emergency up to 150% of its continuous rating in accordance with IEC Publication 354 or IS 6600. Bushings, tap changer and other current-carrying parts shall also be designed for this condition.

21. VOLTAGE RATIO

Each transformer shall be supplied with an on load tap changer (as specified) connected to the high voltage winding. The tap changer shall have 17 tap positions and shall be so arranged as to give variations of transformation ratio in equal steps of 1.25% per step. The total range of the tapchanger shall be from +5.0 percent to -15.0 percent. Tap 5 shall be the principal tap and the transformation ratio at tap 5 shall be 33.00 KV to 11.00 KV.

The no-load voltage ratios shall be as follows:

<table>
<thead>
<tr>
<th>Tap No.</th>
<th>High Voltage</th>
<th>Low Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34.65kV</td>
<td>11.0kV</td>
</tr>
<tr>
<td>5</td>
<td>33.00kV</td>
<td>11.0kV</td>
</tr>
<tr>
<td>17</td>
<td>28.05kV</td>
<td>11.0kV</td>
</tr>
</tbody>
</table>
22. WINDING CONNECTIONS AND VECTOR GROUP

The transformers shall be connected in accordance with IEC Publication 76 or IS 2026 as follows:

HV Winding : Delta connected.
LV Winding : Star connected.
Vector Group : Dyn 11

23. INSULATION LEVELS

The transformers shall be designed and tested to the following insulation levels:

<table>
<thead>
<tr>
<th>Line Terminals</th>
<th>Power Frequency Voltage (rms.)</th>
<th>Lightning Impulse Voltage (peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33kV</td>
<td>70kV</td>
<td>170kV (1.2/50 μ sec.)</td>
</tr>
<tr>
<td>11kV</td>
<td>28kV</td>
<td>75kV (1.2/50 μ sec.)</td>
</tr>
</tbody>
</table>

The windings shall be uniformly insulated and the low voltage neutral point shall be insulated for full voltage.

24. IMPEDANCE VOLTAGE

The impedance on the principal tap (Tap 3) shall be as follows:

<table>
<thead>
<tr>
<th>MVA</th>
<th>Impedance Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.15 MVA</td>
<td>6.25%</td>
</tr>
<tr>
<td>5 MVA</td>
<td>7.15%</td>
</tr>
<tr>
<td>8 MVA</td>
<td>8.35%</td>
</tr>
</tbody>
</table>

The impedance voltage refers to the principal tapping. No negative tolerance on this percentage impedance is allowed. A positive tolerance of +10% is allowed as per IEC 76 / IS 2026.

Transformers of each rating shall have corresponding impedance per tap characteristics such that transformers of the same rating can be operated in parallel.
25. SHORT CIRCUIT PERFORMANCE

The transformer shall be capable of withstanding the thermal and dynamic effects of short circuits, as specified in IEC 76-5 ‘Ability to withstand short circuits’.

Each transformer shall be capable of withstanding for 2 seconds a bolted metallic short circuit on the terminals of either winding with rated voltage on the other winding and the tap-changer in any position.

If short circuit tests have been carried out on the particular design of transformer offered, the test results shall be supplied with the bid.

26. REGULATION

The regulation of each transformer from no-load to continuous rated output at 1.0 power factor and at 0.85 lagging power factor shall be as guaranteed in the Technical Data Schedules.

27. FLUX DENSITY

Each transformer shall be capable of operating continuously with rated current and with system maximum voltage applied to the low voltage winding at a frequency of 96 per cent of rated frequency without exceeding the temperature rise specified in Clause 20.

The limit of flux density at normal voltage and frequency shall be subject to the requirements for losses, harmonics and noise suppression but in any event shall not exceed 1.6 Tesla.

The transformer core shall not be saturated at maximum system voltage i.e. 36.3kV.

28. HARMONIC CURRENTS

The transformers shall be designed with particular attention to the suppression of harmonic voltages, especially the 3rd, 5th and 7th harmonics, so as to eliminate wave form distortion and the possibility of high frequency disturbances, induction effect or of circulating current between neutral points at different transformer stations.

29. PARTIAL DISCHARGE

Each transformer shall be partial discharge free up to 120% of rated voltage as the voltage is reduced from 150% of rated voltage i.e. there shall be no significant rise above background level.

30. ON-LOAD TAP-CHANGERS WITH REMOTE TAP CHANGE CONTROL

Only transformer of capacity 8.00 MVA shall be provided with an on-load tap-changer connected to the high voltage winding. The on-load tap-changer shall be capable of
withstanding the voltages described in Clause 23 and shall comply with the requirements of IEC 214, latest revision.

Its tapping range, number of steps and tap positions shall be as specified in Clause 21.

Adequate access for personnel shall be provided for inspection and maintenance. The guaranteed interval between maintenance periods for the diverter switch shall be 10 years or 50,000 operations. It shall not be possible for oil in the diverter switch compartment to come in contact with the oil in the main transformer tank.

The tap-changer shall be driven by a motor operated mechanism incorporating a stored energy device which shall ensure that once a change of tap begins it is completed and to shall ensure that the mechanism does not fail in an intermediate position on loss of the supply voltage to the motor. The motor shall be rated for 400/230V, 50 Hz and shall operate satisfactorily at any voltage between 85% and 110% of rated voltage.

A tap-changer mechanism box with hinged door and mounted on the transformer tank at a convenient height shall contain all electrical and mechanical parts associated locally with control of the tap-changer. Remote tap-changer controls shall also be provided at a transformer tap change control panel (one per transformer, to be supplied under this contract) in the control room.

Facilities for electrical raise and lower operation (control switch or push button) as well as mechanical operation shall be provided at the tap-change mechanism box. An interlock shall be provided which shall interrupt the electric supply to the drive motor when the manual mechanical operating device is engaged. The motor drive control shall be such that on initiation of a tap-change operation by means of a control switch or push-button the tap-changer shall complete its movement from one service position to an adjacent one irrespective of whether or not the control switch or push-button has been operated continuously during the running time of the motor drive. Another operation shall only be possible when the previous operation has been completed, the control switch or push-button has been released and the control system is again in the rest position.

The tap-changer arrangement shall be such that a command to raise tap-numbers shall result in an increase in the secondary voltage with constant voltage applied to the high voltage winding.

An under and overvoltage monitoring relay fed with line voltage from the owner's voltage transformers on the low voltage side of the transformer and capable of being set in a continuously variable range from 90% to 115% normal voltage (110V) shall be used to give visual and audible signals at the Transformer tap change control panel if the LV voltage lies above or below preset values.

Limit switches shall be provided to prevent over-running of the tap-change mechanism. These shall be directly connected in the motor circuit. In addition mechanical end stops shall be fitted to prevent over-running of the mechanism under any conditions. A counter shall be provided to indicate the number of tap-change operations that have taken place.

A mechanical tap-position indicator shall be provided and it shall be visible from ground level through a window in the door of the mechanism box. Position transmitters e.g. dial switches shall be provided to:

(1) signal tap position to the Transformer tap change control panel in the control room.

(2) signal "out of step" under parallel operating conditions.
Technical Specification for 33/11kV Power Transformers (APDRP Scheme)

A Remote/Local switch shall be provided at the mechanism box to select either remote or local operation. When this switch is turned to the Remote position control shall be passed to the Transformer tap change control panel in the control room. It should be possible to use only one control, i.e., Local or Remote.

It shall be possible to operate a transformer tap-changer independently or in parallel with the tap-changers of other similar transformers in the same substation in either a "master" or "follower" mode. In addition, when operating independently or in parallel in the master mode, it shall be possible to have manual operation by means of control switch, push button or, (in future) automatic operation by means of an automatic voltage regulating relay. Contacts shall be provided for future SCADA control of the tap-changer and for reporting of the tap position and mode of control to the SCADA system.

The parallelising scheme shall use the in step principle and shall have provision for operating singly or in parallel in any combination. It shall be possible for any transformer in a group to be selected as either the master or follower for that group when operating in parallel. Each transformer tap change control panel shall therefore have a manual/automatic control switch or push buttons, independent/master/follower control switch or push buttons as well as "raise" and "lower" control switches or push buttons. Interlock shall be provided to avoid independent operation when the transformers are running in parallel. There should not be any out-of-step during such operation.

The control scheme shall be capable of extension to cater for the total number of transformers to be installed in any future development of the substation. The control mode selected shall be indicated on the front of the Transformer tap change control panel.

Each transformer shall have a miniature circuit breaker (MCB) on the AC distribution cabinet through which the 400/230V, 50 Hz supply to its tap-changer and temperature controls is passed. Separate MCB’s shall be provided at the mechanism box for protection of the motor and control circuits. The control circuits shall operate at 110V single phase, to be supplied from a transformer having a ratio of 230/55-0-55 V, with the centre point earthed through a removable link mounted in the marshalling box or tapchanger mechanism box.

Each tap-changer mechanism box shall be fitted with an anti-condensation space heater (230V AC) controlled by a humidistat with variable range. A lamp for illumination purposes controlled by a door switch shall be provided. Solar gain can give rise to high temperature within a mechanism box. Adequate ventilation shall be provided to ensure that all equipment contained therein shall operate satisfactorily under these conditions.

A terminal block with terminals rated for 10A continuous current, 650V grade of moulded insulating materials shall be provided for panel wiring and external connections. Ten percent spare terminals shall be provided in each mechanism box.

The tap changer mechanism box shall be outdoor, weatherproof type, dust, vermin and damp proof with a degree of protection of IP54 of IEC 529 or IS 13947 equivalent.

30.1. Transformer Tap Change Control Panel

The indoor panel suitable for installation in the owner's control room mentioned above shall contain:

- Raise and Lower pushbuttons or switch,
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- Independent/Master/Follower selector switch.
- Remote tap position indicator.
- Necessary audible and visual alarms.
- Out-of-Step relay with two spare contacts (2 NO and 2 NC).

In addition to the above, the Transformer tap change control panel shall have an audible and visual annunciation system for the following trips and alarms:

- Oil temperature alarm
- Oil temperature trip
- Winding temperature alarm
- Winding temperature trip
- Buchholz alarm
- Buchholz trip
- Surge relay trip (OLTC gear)
- Low oil level alarm
- Tap changer out-of-step alarm
- Failure of DC supply alarm

Two spare windows shall be supplied on each panel.

Indicating lamps shall be panel mounted type with rear terminal connection. Lamps shall be provided with series connected resistors preferably built within the lamp assembly. Lamps shall have screwed translucent lamp covers to diffuse light and shall be continuously rated for 120% of 24 volt DC supply. The DC supply failure lamp shall operate from the AC supply and be rated for 230 volt AC. The wattage of the lamps shall be not more than 5 watts bulbs and lenses shall be interchangeably and easily replaceable from the front of the panel.

The annunciation scheme for the facia windows and alarm bells shall work as follows:

### Annunciation scheme functions

<table>
<thead>
<tr>
<th>Incident</th>
<th>Alarm Bell</th>
<th>Facia Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault occurrence</td>
<td>Ringing</td>
<td>Light Flashing</td>
</tr>
<tr>
<td>Sound Cancel</td>
<td>Off</td>
<td>Light Flashing</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>Off</td>
<td>Steady Light</td>
</tr>
<tr>
<td>Fault cleared and reset</td>
<td>Off</td>
<td>Clear</td>
</tr>
<tr>
<td>Lamp Test</td>
<td>Off</td>
<td>Steady Light</td>
</tr>
</tbody>
</table>

Any new annunciation operating after the operation of the sound cancel shall cause audible and visual alarm even if the process of acknowledging the previous alarm is going on or has yet to be carried out. Resetting facilities for the flasher and audible alarm circuits of the annunciators shall be provided, and provision shall be made for switching of the entire annunciation system. Two spare windows shall be provided.
The control and rely panels shall be metal clad, dust, moisture, rodent and vermin proof with degree of protection not less than IP 41 specified in IEC 529/IS 13947. Panel shall have folded construction and be of unit type. Each panel shall be a free standing structure, in depended floor mounting type and shall be manufactured from cold rolled sheet steel of thickness not less than 2.5 mm. There shall be sufficient reinforcement to provide level surfaces, resistance to vibration and rigidity during transportation, installation and service. The panel shall be painted as specified in the clause on painting in the specification.

Design, material selection and workmanship shall be such as to result in neat appearance inside and outside with no welds, rivets or bolt ends apparent from outside, with all exterior surfaces even and smooth. The equipment on the front of the panel shall be matched to give neat and uniform appearance.

All doors and removable covers shall be gasketed all around with neoprene bonded gaskets. Ventilating louver shall be provided with screens and filters. The screen shall be made of non-corroding metal like brass or, galvanised iron wire mesh.

Transformer tap change control panel shall be supplied with all necessary internal wiring, terminal blocks, relays and alarms to provide the above listed alarm and trip functions.

External wiring from the transformers to the panel and from the panel to the circuit breaker is not included in the scope of supply.

Panel wiring shall be suitably bunched and clamped for neat appearance. The conductors used for wiring purpose shall be PVC insulated 650 V grade semi flexible heat resistant, flame retardant and vermin proof electrolytic copper cable confirming to IEC 227 or IS 1554. The wiring shall be securely supported and taken through PVC troughs. All panel wiring shall be capable of withstanding a voltage of 2 KV AC, 50 Hz for 1 minute.

Terminal blocks of brass studs rated for 10 amps continuous current, 650 volts DC grade covered by moulded insulating material with adequate electrical clearance shall be provided for terminating the panel wiring and outgoing connections. The termination shall be made by crimping lugs or bare conductor with insulating sleeves at the end. The arrangement can be horizontal or vertical as per the standard practice adopted by the manufacturers. All terminal must be numbered and wire terminations provided with numbered ferrules for identification. All numbering and marking including those in wiring diagrams shall follow the guidelines provided in IS 11353. 10% spare terminals shall be provided.

31. COOLING AND TEMPERATURE CONTROL

The banks of cooling radiators shall be detachable from the tank for transport and maintenance. Shut-off valves shall be provided on the tanks of the transformers for this purpose. An air-vent and draining plug shall be provided on each radiator bank. All external surfaces of the radiators shall be hot dip galvanised as specified in Sub-clause 13.2, Part 1 of this document.

Temperature control equipment shall be housed in a local control box mounted on the side of the transformer. A 150mm diameter dial thermometer shall be provided to indicate the temperature of the top oil in the transformer. This thermometer shall be fitted in such a way that it can easily be read from ground level through a window in the door of the control box. The thermometer
shall be fitted with two adjustable contacts, one connected to give an alarm and one to trip associated circuit breakers. It shall also be fitted with a maximum temperature pointer which shall be re-settable by hand.

A similar dial thermometer shall be provided in the control box to indicate winding temperature. This thermometer shall have two sets of adjustable contacts one connected to give an alarm and the other to trip associated circuit breakers and a maximum temperature pointer which shall be re-settable by hand. The minimum range of these contacts shall be 50°C to 100°C for alarm and 60°C to 120°C for trip.

The temperature control box shall be weatherproofed to IP55 of IEC 529 or IS 2147 equivalent. Each box shall have a hinged gasketed door lockable by padlock. Solar gain can give rise to high temperature in a local control box. Adequate ventilation shall be provided to ensure that all equipment contained therein shall operate satisfactorily under these conditions.

A terminal block with 10% spare terminals shall be provided in each temperature control box.

32. TANK AND ACCESSORIES

General

The transformer tank shall be skid mounted type.

The transformer tank shall be designed so that the complete transformer with oil and excluding conservator and radiators can be lifted and transported without permanent deformation or oil leakage.

The tank and cover including the stiffeners shall be designed in such a manner as to leave no external pockets in which water can lodge, or internal pockets where gas/air can collect. All fittings shall be designed so as to prevent entry of air or leakage of oil from the tank.

All pipes, shall be externally welded to the tank wall.

The tank and cover shall be of structural quality, weldable mild steel with a minimum thickness of 3mm. All welding shall be stress relieved. The requirement of post weld heat treatment of tank/stress relieving shall be based on recommendation of BS-5500 table 4.4.3.1.

The tank lid shall not be welded shut, but shall be secured by bolts and provided with suitable oil-tight gasket.

The tank is to withstand vacuum up to 500mm of mercury for 3.15 MVA, 5 MVA and 8 MVA transformers and any pressure of oil developed during operation conditions including short circuits.
The permanent deflection of flat plates after the vacuum has been released shall not exceed the following values:

<table>
<thead>
<tr>
<th>Horizontal length of flat plate (mm)</th>
<th>Permanent deflection (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to and including 750</td>
<td>5</td>
</tr>
<tr>
<td>751 to 1250</td>
<td>6.5</td>
</tr>
<tr>
<td>1251 to 1750</td>
<td>8</td>
</tr>
<tr>
<td>1751 to 2000</td>
<td>9.5</td>
</tr>
<tr>
<td>2001 to 2250</td>
<td>11</td>
</tr>
<tr>
<td>2251 to 2500</td>
<td>12.5</td>
</tr>
<tr>
<td>2501 to 3000</td>
<td>16</td>
</tr>
<tr>
<td>above 3000</td>
<td>19</td>
</tr>
</tbody>
</table>

Surface Treatment

The transformer tank and accessories shall be adequately protected against corrosion. The inside of the tank shall be painted with an approved oil resisting varnish. The outside of the tank shall be painted as specified in Sub-clause 13.1, Part 1 of this document. External surfaces of radiators shall be hot-dip galvanised as specified in Sub-clause 13.2, Part 1 of this document.

Conservator Tank

A conservator tank shall be provided of adequate capacity between lowest and highest visible levels to meet expansion of oil from 0°C to 100°C. A suitable oil level gauge shall be located on the tank so that it can be easily read from ground level. The gauge shall be graduated for temperatures of 0°C, +45°C and +90°C.

Each gauge shall be provided with contacts for separate low oil level alarm and trip signals. The conservator shall be fitted with a filling hole with cap and drain valve. It shall be inclined at about 5 degrees towards the drain valve. The pipe connecting the conservator to the main tank shall project 20mm above the bottom of the conservator for collection of impurities.

Breather

The conservator tank shall be fitted with a breather in which silica gel is the dehydrating agent. The breather shall be a moulded type transparent case of adequate size and so designed that:

- the passage of air through the silica gel does not give rise to any excess pressure rise;
- silica gel crystal of not less than 5mm. size is used;
- the silica gel is sealed from the external atmosphere by means of an oil seal;
- the moisture absorption indicated by a change in colour of the crystals can be easily observed from a distance;
- the breather mounting height facilitates maintenance from ground level without switching out the transformer.

Explosion Vent or Pressure Relief Device

An explosion vent or pressure relief device shall be provided to release any severe build-up of pressure within the tank. The vent shall be designed such that in the event of an explosion, rain,
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sand or any other foreign bodies are prevented from getting into the tank. The vent shall be positioned so as to direct the explosion safely into the oil pit.

Oil Sampling Devices

Oil sampling devices shall be fitted to the main tank. They shall be located suitably for easy access especially during maintenance, one near the bottom of the tank and one near the top.

Oil Filtration

Two 50mm bore filter valves shall be fitted to the tank, one on the top and the other diagonally opposite on the bottom.

Lifting Lugs/Eyes

Lifting lugs shall be provided for supporting the weight of the transformer including core and windings and fittings and with the tank filled with oil.

Jacking Pads

Four jacking pads shall be provided near the corners of the tank of each transformer and approximately 400mm above the lowest part of the tank. These pads shall be designed to take the complete weight of the transformer filled with oil.

Hauling Eyes

Hauling eyes shall be provided on all sides of the transformer.

Earthing Terminals

Earthing terminals shall be provided on the transformer close to each of the four corners of the tank to facilitate easy earthing of the transformer on site.

Oil Valves

In addition to the valves already mentioned, a drain valve shall be provided near the bottom of the tank. All oil valves shall be provided with means for securing them in the open or closed position.

33. CORE AND WINDINGS

33.1. Core

The core shall be constructed from high grade, non-ageing, cold rolled grain oriented silicon steel laminations or superior material.

The core and winding shall be capable of withstanding shocks during transport, installation and service. Provision shall be made to prevent movement of the core and windings relative to the tank during these conditions and also during short circuits.

The design shall avoid the presence of pockets which would prevent the complete emptying of the tank through the drain valve.

33.2. Windings

The winding conductor shall be of electrolytic copper. The insulation shall be free from insulating compounds which are liable to soften, ounce out, shrink or collapse. It shall be non-catalytic and chemically inert in transformer oil during normal service.

The stacks of windings are to receive adequate shrinkage treatment.
The windings and connections are to be braced to withstand shocks during transport, switching, short circuit or other transient conditions.

34. THERMOMETERS
Thermometer pockets shall be provided on all transformer top covers with screwed top to avoid ingress of moisture.

35. TRANSFORMER OIL
The insulation oil shall be mineral oil to the IEC Standard 296 Class 1 or IS 335 whichever is more stringent. The complete first filling shall be of new oil free from inhibitors and additives.

Transformers shall be shipped with oil filled at least to cover the core and coil assembly and the balance, with two percent extra quantity to cover spillage during filling to be supplied in non returnable steel drums.

36. BUCHHOLZ AND GAS PRESSURE RELAYS
A double float Buchholz relay shall be provided in the pipe connection from the main tank to the oil conservator. It shall be provided with isolating valves. The upper float of the Buchholz relay shall operate a contact to give an alarm on accumulation of gases caused by a gradual fault. The lower float shall operate a contact to make a circuit to trip associated circuit breakers in the event of further gas accumulation or a sudden flow of oil caused by an explosive development of gases.

The gas release connection from the Buchholz relay shall be brought down to a gas sampling device accessible from the ground to facilitate sampling with the transformer in service. The test connection from the Buchholz relay may be brought to the gas sampling device if suitable or may be terminated beside it. Isolating valves accessible from ground level shall be provided in both of these connections.

The gas sampling device shall have the following facilities:

(1) Gas connection from the Buchholz relay through an isolating valve on the gas sampling device.

(2) Coupling in the pipe connections to enable the device to be removed from the transformer.

(3) Gas sampling valve at the top with outlet approximately 3mm diameter to make rubber tube connection. The outlet shall have a captive screwed cap.

(4) Oil drain valve at the bottom with blanking plug.

(5) The oil level in the device shall be visible from the front.

An oil surge relay shall be mounted in the pipe leading from the tap-changer head to the oil conservator. The relay shall be actuated by an oil flow caused by a tap-changer fault and its contact shall make a circuit to trip associated circuit breakers and provide annunciation in the control room.
37. TERMINALS

Outdoor bushings shall be provided for the 33 KV and 11 KV terminations. The 11 KV termination shall include a neutral bushing of identical type and rating to the phase bushings. All bushing shall have a minimum creepage distance of 25 mm/ KV. The protected creepage distance shall not be less than 50 % of the total.

All bushings and terminations including the 11 KV neutral shall have a continuous current rating of 200 % of the transformer rating and a 3 second short time rating equal to nominal short circuit current of the system.

Bushing shall be easily replaceable. Cemented in types will not be accepted. Bushing shall conform to IEC 137 and IEC 815/IS 3347 and IS 2099. They shall be sufficiently robust to withstand the normal transport and erection hazards.

33 KV bushing terminals shall be suitable for connection of AAAC conductor using a bimetallic connector. Bidders shall provide detailed drawing of the terminals with their bid.

11 KV bushing terminals shall be suitable for connection of multiple AAAC conductor using a bimetallic connectors. Bidders shall provide detailed drawing of the terminal with their bid.

Terminal Markings

The terminal markings shall be clearly and permanently shown. Painted markings are not acceptable. The windings shall be labelled as follows:

High Voltage : 3 phases and neutral U V W
Low Voltage : 3 phases and neutral u v w

Terminals U, V, W and u, v, w shall be connected to phases R, Y, B, respectively.

38. NOISE LEVEL AND RADIO INFLUENCE LEVEL

The noise level shall be guaranteed by the Supplier and measured in accordance with IEC 551. The guaranteed value shall be stated in the Technical Schedules and the measured noise level shall not exceed this value. Noise levels shall not exceed 52dB.

The maximum radio influence voltage shall be 250μV.

39. LABELS AND RATING PLATES

Labels, plates, markings, and instructions shall be clear and indelible and in the English language. Cast-in or moulded-in words not in English shall be covered with a permanently fixed non-ferrous label inscribed in English.

A rating plate shall be provided in accordance with IEC Publication 76 / IS 2026. In addition a plate showing the location of all valves and air release cocks or plugs shall be provided.
40. **LOSS CAPITALISATION**

Transformer losses shall be capitalised at the following rates:

<table>
<thead>
<tr>
<th>Loss Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Loss</td>
<td>Rs 121,560 per kW</td>
</tr>
<tr>
<td>Copper Loss</td>
<td>Rs 27,399 per kW</td>
</tr>
</tbody>
</table>

Losses will be capitalised at the above rates and added to the Bid Price for the purpose of comparing tenders.

The losses shall be measured during the routine tests. In the event of either the iron or copper loss exceeding its guaranteed value as stated in the Technical Data Schedules the relevant rate above shall be applied to the excess and the resulting amount shall be deducted from the Contract Price.

41. **TESTING**

**General**

Tests shall be carried out on transformers in accordance with IEC Publication 76 / IS 2026, IEC Publication 214 and as specified below.

Prices for type tests should be quoted as separate items.

41.1. **Type Tests**

The following shall be regarded as type tests:

(a) Test of temperature rise. This test shall be carried out on the tap having maximum losses.

(b) Measurements of open-circuit and short-circuit zero-sequence impedances of the HV and LV windings.

(c) Measurement of capacitances.

(d) Short circuit test.

(e) Impulse Test —

   (i) Full-wave impulse voltage withstand test. The test voltage shall be applied to each line and neutral terminal. The applied voltage shall be the relevant lightning impulse voltage specified in the clause on Insulation Levels.
(ii) Chopped-wave impulse voltage withstand test. The test voltage shall be applied to line terminals only. The applied voltage shall be 115% of the relevant lightning impulse voltage specified in the clause on Insulation Levels.

The test sequence to each terminal shall be as follows:

- One reduced full impulse (calibration)
- One 100% full impulse
- Two 115% chopped impulse
- Two 100% full impulse

(g) Noise level measurement, in accordance with IEC Publication 551 using a precision sound level meter conforming to IEC Publication 651. In addition the test shall be repeated with narrow band filters for the harmonic frequencies from 100Hz, up to 350 Hz.

(h) Vacuum test.

(i) Tap-changer tests required by IEC 214 as follows:
- temperature rise of contacts;
- switching tests;
- short-circuit current test;
- transition impedance test;
- mechanical tests;
- dielectric tests.

41.2. Routine Tests

The following shall be regarded as routine tests and shall be carried out on each transformer.

(a) Measurement of winding resistance at principal tap and two extreme taps.

(b) Voltage-ratio measurement and check of vector group.

(c) Measurement of the impedance voltage at principal tap and two extreme taps.

(d) Measurement of the load loss.

(e) Measurement of no-load loss and no-load current, including measurement of harmonics.

(f) Applied voltage test to all auxiliary circuits.

(g) Tests on on-load tap-changer (fully assembled on transformer).
41.3. Routine Test Sequence

The sequence of tests shall be:

(a) Winding resistance measurement, voltage ratio measurement and vector group check.
(b) Separate source voltage withstand test, induced over-voltage withstand test.
(c) Impedance voltage and loss measurements.
(d) Tapchanger test.
(e) Tests on auxiliary circuits.

The following tests on site will be carried out under a different contract after plant is fully assembled:

(a) Ratio and vector group checks.
(b) Insulation resistance (HV-LV, HV-E, LV-E).
(c) Oil tests.
(d) Other necessary pre-commissioning tests.

The Supplier will be held responsible for any discrepancy or defect discovered during these tests and shall rectify immediately on receipt of notification. The Supplier may at his own discretion witness site testing of transformers.

41.4. Rejection.

The purchaser may reject any transformer, if during testing and service the following is found:

(a) Load and/or no-load losses exceed the guaranteed value by 15% or more.
(b) Total losses exceed the guaranteed values by 10% or more.
(c) Impedance differs from the guaranteed value as specified.
(d) Transformer fails any test.
(e) Any deviation from specification is found not considered acceptable.
## PART 3 SCHEDULES

### 42. TECHNICAL DATA SCHEDULE

(Please submit a separate schedule for each size of transformer)

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>UNITS</th>
<th>RIDERS OFFER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33/11kV POWER TRANSFORMERS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transformer Nominal Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>GENERAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacturer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cross-sectional area of conductors:</td>
<td>mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- HV windings</td>
<td>mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- LV windings</td>
<td>mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum current density in windings:</td>
<td>A/mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- HV windings</td>
<td>A/mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- LV windings</td>
<td>A/mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Zero sequence impedance, open circuit</td>
<td>Ohms</td>
<td>Ohms</td>
</tr>
<tr>
<td></td>
<td>- HV windings</td>
<td>Ohms</td>
<td>Ohms</td>
</tr>
<tr>
<td></td>
<td>- LV windings</td>
<td>Ohms</td>
<td>Ohms</td>
</tr>
<tr>
<td></td>
<td>Zero sequence impedance, short circuit</td>
<td>Ohms</td>
<td>Ohms</td>
</tr>
<tr>
<td></td>
<td>- HV windings</td>
<td>Ohms</td>
<td>Ohms</td>
</tr>
<tr>
<td></td>
<td>- LV windings</td>
<td>Ohms</td>
<td>Ohms</td>
</tr>
<tr>
<td></td>
<td>Magnetising current at rated voltage on principal tap</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>
Technical Data Schedule (continued)

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>UNITS</th>
<th>BIDDERS OFFER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winding capacitances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HV winding - Core</td>
<td>μF/ph</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LV winding - Core</td>
<td>μF/ph</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HV winding - LV winding</td>
<td>μF/ph</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total volume of oil</td>
<td>litres</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Volume of oil above level of winding excluding conservator oil</td>
<td>litres</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight of core and windings</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total weight of complete transformer ready for service -</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight of transformer arranged for transport</td>
<td>kg</td>
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<td></td>
<td>Filling medium for transport</td>
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<td></td>
<td>Type of material used for gasket joints</td>
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<tr>
<td></td>
<td>Vacuum withstand capability:</td>
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<tr>
<td></td>
<td>- main tank</td>
<td>kPa</td>
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<td>- conservator</td>
<td>kPa</td>
<td></td>
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<td>- tap-change compartment</td>
<td>kPa</td>
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<td></td>
<td>- radiators</td>
<td>kPa</td>
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Technical Specification for 33/11kV Power Transformers (APDRP Scheme)

Technical Data Schedule (Continued)

<table>
<thead>
<tr>
<th>ITEM NO.</th>
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<th>BIDDERS OFFER</th>
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<tbody>
<tr>
<td></td>
<td>Dimensions of main transport package:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- length mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- width mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- height mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dimensions as installed</td>
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<td></td>
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<tr>
<td></td>
<td>- length overall mm</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>- width overall mm</td>
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<td></td>
<td>- height overall mm</td>
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<tr>
<td>2</td>
<td>STANDARDS</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>In accordance with IEC 76 / IS 2026</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TYPE</td>
<td></td>
<td></td>
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<td></td>
<td>Type</td>
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<td>4</td>
<td>RATED POWER</td>
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<td></td>
<td>Maximum continuous rating on all tap positions at specified service conditions. MVA</td>
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<td></td>
<td>Rating of windings:</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>- HV MVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- LV MVA</td>
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<tr>
<td></td>
<td>Maximum winding hot spot temperature (ambient temperature 45°C) °C</td>
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## Technical Data Schedule (Continued)

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<tr>
<td></td>
<td>Maximum temperature rise in top oil:</td>
<td>°C</td>
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<td>Maximum winding temperature rise measured by resistance:</td>
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<td>VOLTAGE RATIO</td>
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<td>No load voltage ratio:</td>
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<tr>
<td></td>
<td>- Tap 1</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Tap 3</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Tap 9</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>WINDING CONNECTIONS AND VECTOR GROUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Winding connections:</td>
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<td></td>
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<td>- HV</td>
<td></td>
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<td>- LV</td>
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<td></td>
<td>Vector Group</td>
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<td>7</td>
<td>INSULATION LEVELS</td>
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<td></td>
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<tr>
<td></td>
<td>Impulse withstand voltage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- HV winding (1.2/50)</td>
<td>kV peak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- LV winding (1.2/50)</td>
<td>kV peak</td>
<td></td>
</tr>
<tr>
<td>ITEM NO.</td>
<td>DESCRIPTION</td>
<td>UNITS</td>
<td>BIDDERS OFFER</td>
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<tr>
<td>---------</td>
<td>-------------</td>
<td>-------</td>
<td>---------------</td>
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<tr>
<td></td>
<td>- LV neutral</td>
<td>kV peak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Waveshapes for LV neutral</td>
<td>μs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power-frequency test voltage:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- HV winding</td>
<td>kV rms.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- LV winding</td>
<td>kV rms.</td>
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</tr>
<tr>
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<td>- LV neutral</td>
<td>kV rms.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>IMPEDANCE VOLTAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>SHORT CIRCUIT PERFORMANCE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short-circuit withstand capabilities</td>
<td>MVA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 1</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 3</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 9</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>REGULATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regulation at full load (75°C) and unity power factor</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regulation at full load (75°C) and 0.85 power factor lagging</td>
<td>%</td>
<td></td>
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## Technical Data Schedule (Continued)

<table>
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<th>ITEM NO.</th>
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<tbody>
<tr>
<td>11</td>
<td>OVER-FLUXING</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum permissible overfluxing Volts/Hz in % of rated Volts/Hz: for 1 min. for 30 mins. Continuously Flux density at rated voltage on principal tap Maximum flux density in the transformer. State conditions under which it occurs</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>HARMONIC CURRENTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3rd Harmonic as percentage of no load current 5th Harmonic as percentage of no load current 7th Harmonic as percentage of no load current</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>PARTIAL DISCHARGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Background level for partial discharge tests</td>
<td>pC</td>
<td></td>
</tr>
<tr>
<td>ITEM NO.</td>
<td>DESCRIPTION</td>
<td>UNITS</td>
<td>BIDDERS OFFER</td>
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<tr>
<td>---------</td>
<td>--------------------------------------------------</td>
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<tr>
<td>14</td>
<td>ON-LOAD TAP-CHANGER</td>
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<tr>
<td></td>
<td>Tap Changer:</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>- Manufacturer &amp; Type No.</td>
<td></td>
<td>Yes/No</td>
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<tr>
<td></td>
<td>- Located in HV winding</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Range as % of nominal voltage</td>
<td>Step</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Number of steps</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Impulse withstand level</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 50Hz voltage withstand level(1 minute)</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Tap-changer motor rating</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum Current Rating</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method of separating tap change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>selector switch from the main tank oil</td>
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<tr>
<td>15</td>
<td>COOLING AND TEMPERATURE CONTROL</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Cooling:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- radiators on main tank</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of radiators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surface area of each radiator</td>
<td>sq. m</td>
<td></td>
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<tr>
<td>16</td>
<td>TANK AND ACCESSORIES</td>
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<tr>
<td>16.1</td>
<td>SURFACE TREATMENT</td>
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<tr>
<td></td>
<td>Method of surface treatment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Tank</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Radiators etc.</td>
<td></td>
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### Technical Data Schedule (Continued)

<table>
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<tr>
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<td>16.2</td>
<td>CONSERVATOR</td>
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<td>Total volume of conservator</td>
<td>litre</td>
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<td>17</td>
<td>TRANSFORMER OIL</td>
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<tr>
<td></td>
<td>Manufacture and type of transformer oil</td>
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<tr>
<td>18</td>
<td>TERMINALS</td>
<td></td>
<td></td>
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<td>18.1</td>
<td>BUSHINGS</td>
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<td></td>
<td>HV Bushings:</td>
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<tr>
<td></td>
<td>- Manufacturer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Total creepage distances to earth</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Protected creepage distance to earth</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Electrical clearance phase to phase</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Electrical clearance to earth</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Rated current</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Rated voltage</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 1 min. 50Hz dry withstand voltage</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 1 min. 50Hz wet withstand voltage</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Impulse withstand voltage</td>
<td>kV</td>
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</tr>
<tr>
<td></td>
<td>- Rated short-time current</td>
<td>kA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LV Bushings:</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>- Manufacturer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Total creepage distances to earth</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Protected creepage distance to earth</td>
<td>mm</td>
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Technical Data Schedule (Continued)

<table>
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<tbody>
<tr>
<td>1.</td>
<td>- Electrical clearance phase to phase</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Electrical clearance to earth</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Rated current</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Rated voltage</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1 min. 50Hz dry withstand voltage</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1 min. 50Hz wet withstand voltage</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Impulse withstand voltage</td>
<td>kV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Rated short-time current (2 second)</td>
<td>kA</td>
<td></td>
</tr>
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</table>

18.2 NEUTRAL TERMINALS

11kV Neutral Bushing:

- Manufacture
- Type
- Total creepage distances to earth
- Protected creepage distance to earth
- Electrical clearance to earth
- Rated current
- Rated voltage
- 1 min. 50Hz dry withstand voltage
- 1 min. 50Hz wet withstand voltage
- Impulse withstand voltage
- Rated short-time current (2 second)

<table>
<thead>
<tr>
<th>NOISE LEVEL</th>
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Guaranteed noise level in dB (A) to IEC 551:

| dB(A) |
Technical Data Schedule (Continued)

<table>
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<th>ITEM NO.</th>
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<td>INSTALLATION</td>
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<td>Vibration characteristics of supports</td>
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<td>21</td>
<td>GUARANTEED LOSS</td>
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<tr>
<td></td>
<td>Guaranteed no-load loss:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 1</td>
<td>kW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 3</td>
<td>kW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 9</td>
<td>kW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guaranteed load loss:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(75°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 1</td>
<td>kW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 3</td>
<td>kW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tap 9</td>
<td>kW</td>
<td></td>
</tr>
</tbody>
</table>
43. NON COMPLIANCE SCHEDULE

On this schedule the bidder shall provide a list of non compliances with this specification, documenting the effects that such non compliance is likely to have in the equipment's life and operating characteristics. Each non compliance shall be referred to the relevant specification clause.

Where there are no deviations from specifications, the bidder shall so indicate by stating "no deviations" in this schedule.

<table>
<thead>
<tr>
<th>Clause No</th>
<th>Non Compliance</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>
44. **TEST CERTIFICATES SCHEDULE**

On this schedule a list of the test certificates included with the bid shall be provided. This list should include type test certificates and sample routine test reports. Each certificate listed shall be referred to the relevant specification clause and item of equipment to which the test applies.

<table>
<thead>
<tr>
<th>Clause No</th>
<th>Type Test Certificate or Routine Test Report</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Technical Specification for 33/11kV Power Transformers (APDRP Scheme)

1. **SCOPE**

1.1. These specifications cover the design, engineering, manufacturing, shop-testing, pre-delivery inspection, packing, and forwarding, loading at manufacturer’s Works, transportation, transit insurance, supply, delivery, and unloading, storing, and handling at site, erection, installation, testing, and commissioning of 33/11kV Outdoor step down, ONAN cooled Power Transformers of different rating (3.15 MVA, 5 MVA, 8 MVA and 10 MVA) complete with all accessories/fittings and spares as specified herein, to be used in the networks of CESU.

1.2. The equipment offered should have been successfully type tested and the design should have been in satisfactory operation for a period not less than three years as on the date of bid opening. Compliance shall be demonstrated by with the bid,

i) authenticated copies of the type test reports and

ii) performance certificates from the users, specifically from Central Govt./State Govt. or their undertakings.

1.3. The scope of supply should also include the provision of type tests. Rates of type tests shall be given in the appropriate price schedule of the bidding document and will be considered for evaluation. The D.D.G.M., APDRP reserves the right to waive type tests as indicated in the section on Quality Assurance, Inspection and Testing in this specification.

1.4. The Power Transformer shall conform in all respects to the highest standards of engineering, design, workmanship, this specification and the latest revision of relevant standards at the time of tender and the D.D.G.M., APDRP shall have the power to reject any work or material, which, in his judgment, is not in full accordance therewith.

2. **SPECIFIC TECHNICAL REQUIREMENTS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rated MVA (ONAN rating) 3.15 MVA, 5 MVA, 8 MVA and 10 MVA</td>
</tr>
<tr>
<td>2.</td>
<td>No. of phases 3</td>
</tr>
<tr>
<td>3.</td>
<td>Type of installation Outdoor</td>
</tr>
<tr>
<td>4.</td>
<td>Frequency 50Hz (± 5%)</td>
</tr>
<tr>
<td>5.</td>
<td>Cooling medium Insulating Oil (ONAN)</td>
</tr>
<tr>
<td>6.</td>
<td>Type of mounting On Wheel, Mounted on rail</td>
</tr>
<tr>
<td>7.</td>
<td>Rated Voltage</td>
</tr>
<tr>
<td>a)</td>
<td>High Voltage winding 33kV</td>
</tr>
<tr>
<td>b)</td>
<td>Low Voltage winding 11kV</td>
</tr>
<tr>
<td>8.</td>
<td>Highest continuous system voltage</td>
</tr>
<tr>
<td>a)</td>
<td>Maximum system voltage ratio (HV/LV) 36kV/12kV</td>
</tr>
<tr>
<td>b)</td>
<td>Rated voltage ratio (HV/LV) 36kV/11kV</td>
</tr>
<tr>
<td>9.</td>
<td>No. of windings Two winding Transformers</td>
</tr>
<tr>
<td>10.</td>
<td>Type of cooling ONAN (Oil natural / Air natural)</td>
</tr>
<tr>
<td>11.</td>
<td>MVA Rating corresponding to ONAN 100%</td>
</tr>
<tr>
<td>12.</td>
<td>Method of connection:</td>
</tr>
<tr>
<td></td>
<td>HV: Delta</td>
</tr>
<tr>
<td></td>
<td>LV: Star</td>
</tr>
<tr>
<td>13.</td>
<td>Connection symbol Dyn 11</td>
</tr>
<tr>
<td>14.</td>
<td>System earthling Neutral of LV side to be solidly earthed.</td>
</tr>
</tbody>
</table>
Technical Specification for 33/11kV Power Transformers (APDRP Scheme)

15. Percentage impedance voltage on normal tap and MVA base at 750°C corresponding to HV/LV rating and applicable tolerances:

<table>
<thead>
<tr>
<th>%</th>
<th>Impedance</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>3.15 MVA</td>
<td>6.25</td>
</tr>
<tr>
<td>b</td>
<td>5.0 MVA</td>
<td>7.15</td>
</tr>
<tr>
<td>c</td>
<td>8.0 MVA</td>
<td>8.35</td>
</tr>
<tr>
<td>d</td>
<td>10.0 MVA</td>
<td>8.35</td>
</tr>
</tbody>
</table>

16. Intended regular cyclic overloading of Windings

<table>
<thead>
<tr>
<th>Type of Overloading</th>
<th>Temp. Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Anticipated unbalanced loading</td>
<td>Around 10%</td>
</tr>
<tr>
<td>b) Anticipated continuous loading of windings (HV/LV)</td>
<td>110% of rated current</td>
</tr>
</tbody>
</table>

17. Type of tape changer and Range of tapping

<table>
<thead>
<tr>
<th>Type of Tap Changer</th>
<th>Range of Taping</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Type of tape changer</td>
<td>Off-load tap changer for all ratings</td>
</tr>
<tr>
<td>b) Range of tapping</td>
<td>5% to -10% in equal steps of 2.5% each on winding.</td>
</tr>
<tr>
<td>HV</td>
<td>On LV side only</td>
</tr>
</tbody>
</table>

18. Natural terminal to be brought out

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Natural terminal to be brought out</td>
</tr>
</tbody>
</table>

19. Over Voltage operating capacity and duration

<table>
<thead>
<tr>
<th>Operating</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>112.5% of rated voltage (continuous)</td>
</tr>
</tbody>
</table>

20. Maximum Flux Density in any part of the core and yoke at rated MVA, rated voltage i.e. 33kV/11kV and system frequency of 50Hz.

<table>
<thead>
<tr>
<th>Flux Density</th>
<th>Tesla</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6 Tesla</td>
<td></td>
</tr>
</tbody>
</table>

21. Insulation levels for windings:

<table>
<thead>
<tr>
<th>Type of Insulation</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 1.2/50 microsecond wave shape impulse withstand (KVP)</td>
<td></td>
</tr>
<tr>
<td>b) Power frequency voltage withstand (KV-rms)</td>
<td></td>
</tr>
</tbody>
</table>

22. Type of winding insulation

<table>
<thead>
<tr>
<th>Type of Winding</th>
<th>Insulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) HV winding</td>
<td>Uniform</td>
</tr>
<tr>
<td>b) LV winding</td>
<td>Uniform</td>
</tr>
</tbody>
</table>

23. Withstand time for three phase short circuit

<table>
<thead>
<tr>
<th>Withstand Time</th>
<th>Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Seconds</td>
<td></td>
</tr>
</tbody>
</table>

24. Noise level at rated voltage and frequency

<table>
<thead>
<tr>
<th>Noise Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>As per NEMA publication No. TR-</td>
<td></td>
</tr>
</tbody>
</table>

25. Permissible Temperature Rise over ambient Temperature of 50°C

<table>
<thead>
<tr>
<th>Type of Measurement</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Of top oil measured by thermometer</td>
<td>45°C</td>
</tr>
<tr>
<td>b) Of winding measured by resistance</td>
<td>50°C</td>
</tr>
</tbody>
</table>

26. Minimum clearances in air (mm)

<table>
<thead>
<tr>
<th>Type of Clearances</th>
<th>Phase to Phase</th>
<th>Phase to ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) HV</td>
<td>350</td>
<td>320</td>
</tr>
<tr>
<td>b) LV</td>
<td>280</td>
<td>140</td>
</tr>
</tbody>
</table>
28. Terminals
a) HV winding line end
b) LV winding type
26 KV oil filled porcelain communicating type of bushings (Antifog type)
12 KV porcelain type of bushing (Antifog

29. Insulation level of bushing
a) Lightning impulse withstand (KVP)
b) 1 minute Power frequency withstand voltage (KV – rms)
c) Creepage distance (mm) (minimum)
HV 170
70
900
LV 75
28
300
Electrolytic copper

30. Material of HV and LV Conductor
31. Accommodation on tank for outdoor neutral C.T. (For 8 MVA and 10 MVA transformers only)
Yes

32. Neutral side C.T. for owner’s use :
1) Type
2) Quantity
3) Voltage class
4) No. of cores
5) Current ratio(A/A)
6) Turn Ratio
7) Knee point voltage
8) Class of Accuracy
9) Maximum secondary winding resistance at 75°C
10) Location for mounting station
Single phase out door mounted
One in LV side
12KV
One
As per system requirement.
Identical to the turns ratio, provided on HV and LV side
600 volts(min.)
P.S.
5 Ohms
In neutral lead before connection to
earth
1 (one amp.)

33. Maximum current density for HV and LV winding for rated current
2.8 A/mm²

34. Polarisation index i.e. ratio of megger values at 600sec. to 60sec. for HV to earth, LV to earth and HV to LV.
Shall be greater than or equal to 1.5, but less than or equal to ‘5’.

35. Core Assembly
Boltless type

36. Temperature Indicator
a) Oil
b) Winding
One number
One number

37. Maximum permissible no load at rated voltage and rated frequency.
3.15 MVA 4.5 KW
5.00 MVA 6.5 KW
8.00 MVA 8.5 KW
10.00 MVA 10.0 KW
38. Maximum permissible load loss at rated current and at 75°C

<table>
<thead>
<tr>
<th>MVA</th>
<th>kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.15</td>
<td>23.00</td>
</tr>
<tr>
<td>5.00</td>
<td>34.00</td>
</tr>
<tr>
<td>8.00</td>
<td>50.00</td>
</tr>
<tr>
<td>10.00</td>
<td>57.00</td>
</tr>
</tbody>
</table>

2.3. PERFORMANCE

i) Transformer shall be capable of withstanding for two seconds without damage to any external short circuit, with the short circuit MVA available at the terminals.

ii) The maximum flux density in any part of the core and yoke at rated MVA. Voltage and frequency shall be 1.6 Tesla (maximum).

iii) Transformer shall under exceptional circumstances due to sudden disconnection of the load, be capable of operating at the voltage approximately 25% above normal rated voltage for a period of not exceeding one minute and 40% above normal for a period of 5 seconds.

iv) The transformer may be operated continuously without danger on any particular tapping at the rated MVA ± 12.5% of the voltage corresponding to the tapping.

v) The thermal ability withstand short circuit shall be demonstrated by calculation.

vi) Transformer shall be capable of withstanding thermal and mechanical stress caused by any symmetrical and asymmetrical faults on any winding.

2.4. AUXILIARY POWER SUPPLIES

The following power supplies shall be available at site:

i) AC 3-phase, 400 volts, 50Hz. Earthed

ii) AC 1-phase, 230 volts, 50Hz. Earthed

iii) 24 V DC.

2.5. DRAWINGS/ DOCUMENTS INCORPORATING THE FOLLOWING PARTICULARS SHALL BE SUBMITTED WITH THE BID

i) General outline drawing showing shipping dimensions and overall dimensions, net weights and shipping weights, quality of insulating oil, spacing of wheels in either direction of motions, location of coolers, marshalling box and tap changers etc.

ii) Assembly drawings of core, windings etc. and weights of main components parts.

iii) Height of center line on HV and LV connections of transformers from the rail top level.

iv) Dimensions of the largest part to be transported.

v) GA drawings / details of various types of bushing.

vi) Tap changing and Name Plate diagram.

vii) Type test certificates of similar transformers.

viii) Illustrative and descriptive literature of the Transformer.

ix) Maintenance and Operating Instructions.

2.6. MISCELLANEOUS

i) Padlocks along with duplicate keys as asked for various values, marshalling box etc. shall be supplied by the contractor, wherever locking arrangement is provided.

ii) Foundation bolts for wheel locking devices of Transformer shall be supplied by the Contractor.
2.7. **DELIVERY**

The full quantity of the equipments shall be delivered, erected and commissioned at site on turnkey contract basis as per the delivery schedule appended to this specification.

2.8. **SCHEDULES**

All Schedules annexed to the specification shall be duly filled by the bidder separately.

2.9. **ALTITUDE FACTOR**

If the equipment is to be installed in the hilly area, necessary correction factors as given in th Indian Standard for oil temperature rise, insulation level etc. shall be applied to the Standard Technical Parameters given above.

2.10. **NAME PLATE**

Transformer rating plate shall contain the information as given in clause 15 of IS-2026 (part-1). The details on rating plate shall be finalized during the detailed engineering. Further, each transformer shall have inscription of purchaser’s name. the name plate shall also include (i) The short circuit rating, (ii) Measured no load current and no load losses at rated voltage and rated frequency, (iii) measured load losses at 75°C (normal tap only), (iv) D.C. resistance of each winding at 75°C.

3. **SERVICE CONDITIONS**

The service conditions shall be as follows

- Maximum a altitude above sea level: 1,000m
- Maximum ambient air temperature: 50°C
- Maximum daily average ambient air temperature: 35°C
- Minimum ambient air temperature: 5°C
- 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 day per annum (isokeraunic level): 70
- Average number of rainy days per annum: 120
- Average annual rainfall: 1500 mm
- Maximum wind pressure: 260Kg./m²

Environmentally, the region where the equipment will be installed includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators.

Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive, tropical and humid coastal atmosphere.

4. **SYSTEM CONDITIONS**

The equipment shall be suitable for installation in supply systems of the following characteristics.

- Frequency
- Nominal system voltages
- Maximum system voltages

<table>
<thead>
<tr>
<th>System Voltage</th>
<th>33KV System</th>
<th>36.3KV</th>
</tr>
</thead>
</table>

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- Nominal short circuit level: 11KV System 12KV
  (Basing on apparent power)
- Insulation levels:
  - 1.2/50 μ sec impulse withstand voltage: 11KV System 75KV(peak)
  - Power frequency one minute withstand (wet 7 dry) voltage: 33KV System 70KV(rms)
  - Neutral earthing arrangements: 11 KV System Solidly earthed

5. CODES and STANDARDS

5.1. (i) The design, material, fabrication, manufacture, inspection, testing before dispatch, erection, testing commissioning and performance of power transformers at site shall comply with all currently applicable statutory regulations and safety codes in the locality where the equipment will be installed. The equipment shall also conform to the latest applicable standards and codes of practice. Nothing in this specification shall be construed to relieve the Contractor of this responsibility.

5.2. The equipment and materials covered by this specification shall conform to the latest applicable provision of the following standards:

- IS : 5 : Colour for ready mixed paints
- IS : 323 : Three Phase induction Motors
- IS : 335 : New insulating oil for transformers, switch gears
- IS : 1271 : Classified of insulating materials for electrical machinery and apparatus in relation to their stability in services
- IS : 2026(Part I to IV) : Power Transformer
- IS : 2071 : Method of high voltage testing
- IS : 2099 : High voltage porcelain bushings
- IS : 2147 : Degree of protection
- IS : 2705 : Current transformers
- IS : 3202 : Code of practice for climate proofing of electrical equipment
- IS : 3347 : Dimension for porcelain transformer Bushings
- IS : 3637 : Gas operated relays
- IS : 5561 : Fitting and accessories for Power Transformers
- IS : 5561 : Electric Power Connectors
- IS : 6600/BS:CP’10:0 : Guide for loading of oil immersed Transformers
- IS : 10028 : Code of practice for selection, installation and maintenance of transformers, Part. I, II and III
- C.I.P. Publication : Manual on Transformers

If the standard is not quoted for any item, it shall be presumed that the latest version of Indian Standard shall be applicable to that item.
The equipment complying other internationally accepted standards, may also be considered if they ensure performance superior to the Indian Standards.

5.3. DRAWINGS

a) The contractor shall furnish, within fifteen days after issuing of Letter of Award, six copies each of the following drawings/documents incorporating the transformer rating for approval.

i) Detailed overall general arrangement drawing showing front and side elevations and plan of the transformer and all accessories including radiators and external features with details of dimensions, spacing of wheels in either direction of motion, net weight and shipping weights, crane lift for un-tanking, size of lugs and eyes, bushing lifting dimensions, clearances between HV and LV terminals and ground, quantity of insulating oil etc.

ii) Assembly drawings of core and winding and weights of main components / parts.

iii) Foundation plan showing loading on each wheel and jacking points with respect to centre line of transformer.

iv) GV drawings details of bushing and terminal connectors.

v) Name plate drawing with terminal marking and connection diagrams.

vi) Wheel locking arrangement drawings.

vii) Transportation dimensions drawings.

viii) Magnetization characteristic curves of PS class neutral and phase side current transformers if applicable.

ix) Interconnection diagrams.

x) Over fluxing withstand time characteristic of transformer.

xi) GA drawing of marshalling box.

xii) Control scheme/wiring diagram of marshalling box.

xiii) Technical leaflets of major components and fittings.

xiv) A built drawings of schematics, wiring diagram etc.

xv) Setting of oil temperature indicator, winding temperature indicator.

xvi) Completed technical data sheets.

xvii) Details including write-up of tap changing gear.

xviii) HV conductor bushing.

xix) Bushing Assembly

xx) Bi-metallic connector suitable for connection to 100 mm² up to 232 mm² AAAC Conductor.

xxi) GA of LV cable Box.

xxii) Radiator type assembly.
b) All drawings, documents, technical data sheets and certificates, results calculations shall be furnished.

5.4. Any approval given to the detailed drawings by the purchaser shall not relieve the contractor of the responsibility for correctness of the drawing and in the manufacture of the equipment. The approval given by the purchaser shall be general with over all responsibility with contractor.

6. GENERAL CONSTRUCTIONAL FEATURES

6.1. All materials used shall be of best quality and of the class most suitable for working under the conditions specified and shall withstand the variations of temperature and atmospheric conditions without distortion or deterioration or the setting up of undue stress which may impair suitability of the various part for the work which they have to perform.

6.2. Similar parts particularly removable ones shall be interchangeable.

6.3. Pipes and pipe fittings, screws, studs, nuts and bolts used for external connections shall be as per the relevant standards. Steel bolts and nuts exposed to atmosphere shall be galvanized.

6.4. Nuts, bolts and pins used inside the transformers and tap changer compartments shall be provided with lock washer or locknuts.

6.5. Exposed parts shall not have pockets where water can collect.

6.6. Internal design of transformer shall ensure that air is not trapped in any location.

6.7. Material in contact with oil shall be such as not to contribute to the formation of acid in oil. Surface in contact with oil shall not be galvanized or cadmium plated.

6.8. Labels, indelibly marked, shall be provided for all identifiable accessories like Relays, switches current transformers etc. all label plates shall be of non-corroding material.

6.9. All internal connections and fastenings shall be capable of operating under overloads and over-excitation, allowed as per specified stands without injury.

6.10. Transformer and accessories shall be designed to facilitate proper operation, inspection, maintenance and repairs.

6.11. No patching, plugging, shimming or other such means of overcoming defects, discrepancies or errors will be accepted.

6.12. Schematic Drawing of the wiring, including external cables shall be put under the pressure sheet on the inside door of the transformer marshalling box.

6.13. Painting

6.13.1. All paints shall be applied in accordance with the paint manufacturer's recommendations. Particular attention shall be paid to the following:

   a. Proper storage to avoid exposure as well as extremes of temperature.
   b. Surface preparation prior to painting.
   c. Mixing and thinning.
   d. Application of paints and the recommended limit on time intervals between coats.
   e. Shelf life for storage.
6.13.1.1. All paints, when applied in normal full coat, shall be free from runs, sags, wrinkles, patchiness, brush marks or other defects.

6.13.1.2. All primers shall be well marked into the surface, particularly in areas where painting is evident, and the first priming coat shall be applied as soon as possible after cleaning. The paint shall be applied by airless spray according to the manufacturer’s recommendations. However, wherever airless spray is not possible, conventional spray be used with prior approval of purchaser.

6.13.1.3. The supplier shall, prior to painting project nameplates, lettering gauges, sight glassed, light fittings and similar such items.

6.13.2. Cleaning and Surface Preparation

6.13.2.1. After all machining, forming and welding has been completed, all steel work surfaces shall be thoroughly cleaned of rust, scale, welding slag or spatter and other contamination prior to any painting.

6.13.2.2. Steel surface shall be prepared by Sand/ Shot blast Clean or Chemical cleaning by Seven tank process including Phosphating to the appropriate quality.

6.13.2.3. The pressure and Volume of the compressed air supply for the blast cleaning shall meet the work requirements and shall be sufficiently free from all water contamination prior to any painting.

6.13.2.4. Chipping, scraping and steel wire brushing using manual or power driven tools cannot remove firmly adherent mill-scale and shall only be used where blast cleaning is impractical.

6.13.3. Protective Coating

As soon as all items have been cleaned and within four hours of the subsequent drying, they shall be given suitable anticorrosion protection.

6.13.4. Paint Material

Followings are the type of paints that may be suitably used for the items to be painted at shop and supply of matching paint to site;

i) heat resistant paint (Hot oil proof) for inside surface.
ii) For external surfaces one coat of Thermo setting Paint or 2 coats of Zinc Chromate followed by 2 coats of Synthetic Enamel paint. The color of the finishing coats shall be dark admiral grey conforming to No.632 or IS 5:1961.

6.13.5. Painting Procedure

6.13.5.1. All painting shall be carried out in conformity with both specification and with the paint manufacturer’s recommendations. All paints in any one particular system, whether shop or site applied, shall originate from one paint manufacturer.

6.13.5.2. Particular attention shall be paid to the manufacturer’s instructions on storage, mixing, thinning and pot life. The paint shall only be applied in the manner detailed by the manufacturer e.g. brush, roller, conventional or airless spray and shall be applied under the manufacturer’s recommended condition. Minimum and maximum time intervals between coats shall be closely followed.
6.13.5.3. All prepared steel surface should be primed before visible rusting occurs or within 4 hours whichever is sooner. Chemical treated steel surfaces shall be primed as soon as the surface is dry and while the surface is warm.

6.13.5.4. Where the quality of film is impaired by excess film thickness, (wrinkling, mud cracking or general softness) the supplier shall remove the unsatisfactory paint coatings and apply another. As a general rule, dry film thickness should not exceed the specified minimum dry film thickness by more than 25%. In all instances, where two or more coats of the same paints are specifies, such coatings may or may not be of contrasting colors.

6.13.5.5. Paint applied to items that are not be painted, shall be removed at supplier's expense, leaving the surface clean, unstained and undamaged.

6.13.6. Damages to Paints Work

6.13.6.1. Any damage occurring to any part of the painting scheme shall be made good to the same standard of corrosion protection and appearance as that originally employed.

6.13.6.2. Any damaged paint work shall be made as follows:
a) The damaged area, together with an area extending 25mm around its boundary, shall be cleaned down to bare metal.

b) A priming coat shall immediately applied, followed by a full paint finish equal to that originally applied and extending 50mm around the perimeter of the originally damaged.

6.13.6.3. The repainted surface shall present a smooth surface. This shall be obtained by carefully chamfering the paint edges before and after priming.

6.13.7. Dry Film thickness

6.13.7.1. To the maximum extent practicable, the coats shall be applied as a continuous film of uniform thickness and free of pores. Over-spray, skips, runs, sags and drops should be avoided. The different coats may or may not be same color.

6.13.7.2. Each coat of paint shall allowed to hardened before the next is applied as per manufacture's recommendations.

6.13.7.3. Particular attention must be paid to full film thickness at edges.

6.13.7.4. The requirement for the dry film thickness (DFT) of paint and the material to be used shall be as given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Paint Type</th>
<th>Area to be painted</th>
<th>No. of Coats</th>
<th>Total Dry Film Thickness (Min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Powder Paint (2) Thermo setting powder</td>
<td>Inside outside</td>
<td>01</td>
<td>20 Micron</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>01</td>
<td>60 Micron</td>
</tr>
<tr>
<td>2.</td>
<td>Liquid paint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Zinc Chromate(Primer)</td>
<td>Out side</td>
<td>02</td>
<td>45 micron</td>
</tr>
<tr>
<td></td>
<td>b) Synthetic</td>
<td>Out side</td>
<td>02</td>
<td>35 micron</td>
</tr>
<tr>
<td></td>
<td>c) Enamel(Finish Coat)</td>
<td>inside</td>
<td>01</td>
<td>35 micron</td>
</tr>
<tr>
<td></td>
<td>Hot Oil paint</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. DETAILED DESCRIPTION

7.1. Tank
7.1.1. The transformer tank and cover shall be fabricated from high grade low carbon plate steel of tested quality. The tank and the shall be of welded construction.

7.1.2. Tank shall be designed to permit lifting by crane or jacks of the complete transformer assembly filled with oil. Suitable lugs and bosses shall be provided for this purpose.

7.1.3. All brans, flanges, lifting lugs, braces and permanent parts attached to the tank shall be welded and where practicable, they shall be double welded.

7.1.4. The main tank body of the transformer, excluding tap changing compartments and radiators. Shall be capable of withstanding pressure of 760mm. of Hg.

7.1.5. Inspection hole(s) with welded flange(s) and bolted cover(s) shall be provided on the tank cover. The inspection hole(s) shall be of sufficient size to afford easy access to the lower ends of the bushings, terminals etc.

7.1.6. All bolted connections to the tank shall be fitted with suitable oil-tight gaskets which shall give satisfactory service under the operating conditions for complete life of the transformer. Special attention shall be given to the methods of making the hot oil-tight joints between the tank and the cover as also between the tank cover and the bushings and all outlets to ensure that the joint can be remade satisfactorily and with ease, with the help of semi-skilled labour. Where compressible gaskets are used, steps shall be provided to prevent over-compression.

7.1.7. Suitable guides shall be provided for positioning the various parts during assembly or dismantling. Adequate space shall be provided between the cores and windings and the bottom of the tank for collection of any sediment.

7.2. Tank Cover

The transformer top shall be provided with a detachable tank cover with bolted flanged gasket joint. Lifting lugs shall be provided for removing the cover. The surface of the cover shall be suitable sloped so that it does not retain water.

7.3. UNDER CARRIAGE

7.3.1. The transformer tank shall be supported on steel structure with detachable plain rollers completely filled with oil. Suitable channels for movement of roller with transformer shall be space accordingly, rollers wheels shall be provided with suitable rollers bearings, which will resist rust and corrosion and shall be equipped with fittings for lubrication. It shall be possible to swivel the wheels in two directions, at right angle to or parallel to the main axis of the transformers.

7.4. CORE

7.4.1. Stage level inspection for core construction shall be carried out by the owner.

7.4.2. Each lamination shall be insulated such that it will not deteriorate due to mechanical pressure and the action of hot transformer oil.

7.4.3. The core shall be constructed either from high grade, non-aging Cold Rolled Grain Oriented (CRO) silicon steel laminations conforming to grade M4 or better like H1B or laser grade. The maximum flux density in any part of the cores and yoke at normal voltage and frequency shall not be more than 1.6 Tesla. The Badder shall provide saturation curve of the core material, proposed to be used.
7.4.4. The bidder should offer the core for inspection and approval by the purchaser during the manufacturing stage. Bidder’s call notice for the purpose should be accompanied with the following documents as applicable as a proof towards use of prime core material:

a) Invoice of the supplier
b) Mills test certificate
c) Packing list
d) Bill of lading
e) Bill of entry certificate to customs

Core material shall be directly procured either from the manufacturer or through their accredited marketing organization of repute, but not through any agent.

7.4.5. The laminations shall be free of all burrs and sharp projections. Each sheet shall have an insulting coating resistant to the action of hot oil.

7.4.6. The insulation structure for the core to clasp plates, shall be such as to withstand 2000 V DC voltage for one minute.

7.4.7. The complete core and coil shall be so assembled that the axis and the plane of the outer surface of the core assembly shall not deviate from the vertical plane by more than 25mm.

7.4.8. All steel sections used for supporting the core shall be thoroughly shot or sand blasted, after cutting, drilling and welding.

7.4.9. The finally assembled core with all the clamping structures shall be free from deformation and shall not vibrate during operation.

7.4.10. The core clamping structure shall be designed to minimize eddy current loss.

7.4.11. The framework and clamping arrangements shall be securely earthed.

7.4.12. The core shall be carefully assembled and rigidly clamped to ensure adequate mechanical strength.

7.4.13. Oil ducts shall be provided, where necessary, to ensure adequate cooling inside the core. The welding structure and major insulation shall not obstruct the free flow of oil through such ducts.

7.4.14. The design of magnetic circuit shall be such as to avoid static discharges, development of short circuit paths within itself or to the earth clamping structure and production of flux component at right angle to the plane of the laminaion, which may cause local heating. The supporting framework of the cores shall be so designed as to avoid the presence of pockets, which would prevent complete emptying of the tank through the drain valve or cause trapping of air during filling.

7.4.15. The construction is to be of boltless core type. The core shall be provided with lugs suitable for lifting the complete core and coil assembly. The core and coil assembly shall be so fixed in the tank that shifting will not occur during transport or short circuits.

7.5. INTERNAL EARTHING

7.5.1. All internal metal parts of the transformer, with the exception of individual laminations and their individual clamping plates shall be earthed.

7.5.2. The top clamping structure shall be connected to the tank by a copper strap. The bottom clamping structure shall be earthed by one or more the following method.
a) By connection through vertical tie-rods to the top structure.
b) By direct metal to metal contact with the tank base.
c) By a connection to the structure on the same side of the core as the main earth connection to the tank.

7.5.3. The magnetic circuit shall be connected to the clamping structure at one point only and this shall be brought out of the top cover of the transformer tank through a suitably rated insulator. A disconnecting link shall be provided on transformer tank to facilitate disconnections from ground for IR measurement purpose.

7.5.4. Coil clamping rings of metal at earth potential shall be connected to the adjacent core clamping structure on the same side as the main earth connections.

7.6. WINDING

7.6.1. Winding shall be subjected to a shrinking and seasoning process, so that no further shrinkage occurs during service. Adjustable devices shall be provided for taking up possible shrinkage in service.

7.6.2. All low voltage windings for use in the circular coil concentric shall be wound on a perforated insulating cylinder for mechanical protection of the winding in handling and placing around the core.

7.6.3. Winding shall not contain sharp bends which might damage the insulation or produce high dielectric stresses. No strip conductor wound on edge shall have width exceeding six times the thickness.

7.6.4. Materials used in the insulation and assembly of the windings shall be insulable, non catalytic and chemically inactive in the hot transformer oil and shall not soften or the otherwise affected under the operating conditions.

7.6.5. Varnish application on coil windings may be given only for mechanical protection and not for improvement in dielectric properties. In no case varnish or other adhesive be used which will seal the coil and prevent evacuation of air and moisture and impregnation by oil.

7.6.6. Winding and connections shall be braced to withstand shocks during transport or short circuit.

7.6.7. Permanent current carrying joints in the windings and leads shall be welded or brazed. Clamping bolts for current carrying parts inside oil shall be made of oil resistant metal which shall not be affected by acidity in the oil steel bolts, if used, shall be suitably treated.

7.6.8. Terminal of all winding shall be brought out of tank through bushings for external connections.

7.6.8.1. The completed core and coil assemble shall be dried in vacuum at not more than 0.5mm. of mercury absolute pressure and shall be immediately impregnated with oil after the drying process to ensure the elimination of air and moisture within the insulation. Vacuum may be applied in either vacuum over or in the transformer tank.

7.6.8.2. The winding shall be so designed that all coil assemblies of identical voltage ratings shall be interchangeable and field repairs to the winding can be made readily without special equipment. The coil shall have high dielectric strength.

7.6.8.3. Coils shall be made of continuous smooth high grade electrolytic copper conductor, shaped and braced to provide for expansion and contraction due to temperature changes.

7.6.8.4. Adequate barriers shall be provided between coils and core 7 between high and low voltage coil. Lead turn shall have additional protection against abnormal line disturbances.
7.6.8.5. The insulation of winding shall be designed to withstand voltage stress arising from surge in transmission lines due to atmospheric or transient conditions caused by switching etc.

7.6.8.6. Tapping shall not be brought out from inside the coil or from intermediate turns and shall be so arranged as to preserve as far as possible magnetic balance of transformer at all voltage ratios.

7.6.8.7. Magnitude of impulse surges transferred from HV to LV windings by electro magnetic induction and capacitance coupling shall be limited to BIL of LV winding.

7.7. **INSULATING OIL**

7.7.1. The insulating oil for the transformer shall be of EHV grade, generally conforming to IS:335. No inhibitors shall be used in the oil.

7.7.2. The quantity of oil required for the first filling of the transformer and full specification shall be stated in the bid. The bidder shall quote the price of transformer complete with first filling of oil plus 10% extra. However, the rate of transformer oil in Rupees per litre shall be quoted separately also. The transformer oil shall be supplied in non-returnable drums.

7.7.3. The design and materials used in the construction of the transformer shall be such as to reduce the risk of the development of acidity in the oil.

7.7.4. The contractor shall warrant that oil furnished is in accordance with the following specifications.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Appearance</td>
<td>The oil shall be clear and transparent and free from suspended matter or sediment.</td>
<td>IS: 1448</td>
</tr>
<tr>
<td>02</td>
<td>Density at 20°C</td>
<td>0.89 g/cm³ Max.</td>
<td>IS: 1448</td>
</tr>
<tr>
<td>03</td>
<td>Kinematic Viscosity at 27°C</td>
<td>27 CST Max.</td>
<td>IS: 1448</td>
</tr>
<tr>
<td>04</td>
<td>Interfacial tension at 27°C</td>
<td>0.03 N/m.</td>
<td>IS: 6104</td>
</tr>
<tr>
<td>05</td>
<td>Flash point</td>
<td>136°C</td>
<td>IS: 1448</td>
</tr>
<tr>
<td>06</td>
<td>Pour point max.</td>
<td>-6°C</td>
<td>IS: 1448</td>
</tr>
<tr>
<td>07</td>
<td>Neutralization Value (Total Acidity) Max.</td>
<td>0.03mg KOH/gm.</td>
<td>IS: 335</td>
</tr>
<tr>
<td>08</td>
<td>Electric strength Breakdown (voltage) Min.</td>
<td>72.5 KV</td>
<td>IS: 6792</td>
</tr>
<tr>
<td>09</td>
<td>Dielectric dissipation factor tan delta at 90°C</td>
<td>0.03 Max.</td>
<td>IS: 6262</td>
</tr>
<tr>
<td>10</td>
<td>Min specific resistance/resistivity) at 90°C</td>
<td>35X10 ohm cm (min)</td>
<td>IS: 6103</td>
</tr>
<tr>
<td>11</td>
<td>Oxidation stability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Neutralization value after oxidation</td>
<td>0.40mg KOH/g</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Total sludge after oxidation</td>
<td>0.10% by weight max.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Presence of oxidation Inhibitor</td>
<td>The oil shall not contain anti oxidant Additives.</td>
<td>IS: 335</td>
</tr>
<tr>
<td>15</td>
<td>Water content Max:</td>
<td>Less than 25ppm.</td>
<td>IS: 2362</td>
</tr>
</tbody>
</table>
7.8. VALVES

i) Valves shall be of forged carbon steel up to 50mm size and of gun metal or of cast iron bodies with gun metal fittings for sizes above 50mm. They shall be of full way type with screwed ends and shall be opened by turning counter clockwise when facing the hand wheel. There shall be no oil leakage when the valves are in closed position.

ii) Each valve shall be provided with an indicator to show the open and closed positions and shall be provided with facility for padlocking in either open or closed position. All screwed valves shall be furnished with pipe plugs for protection. Padlocks with duplicate keys shall be supplied along with the valves.

iii) All valves except screwed valves shall be provided with flanges having machined faced drilled to suit the applicable requirements, oil tight blanking plates shall be provided for each connection for use when any radiator is detached and for all valves opening to atmosphere. If any special radiator valve tools are required the contractor shall supply the same.

iv) Each transformer shall be provided with following valves on the tank:

a) Drain valve so located as to completely drain the tank.

b) Two filter valves on diagonally opposite corners of 50mm size.

c) Oil sampling valves not less than 8mm at top and bottom of main tank.

d) One 15mm. air release plug.

e) Valves between radiators and tank.

Drain and filter valves shall be suitable for applying vacuum as specified in the specifications.

7.9. ACCESSORIES

7.9.1. Bushing

i) All porcelain used in bushings shall be homogeneous, non-porous, uniformly glazed to brown colour and free from blisters, burns and other defects.

ii) Stress due to expansion and contraction in any part of the bushing shall not lead to deterioration.

iii) Bushing shall be designed and tested to comply with the applicable standards.

iv) Liquid oil filled bushings shall be equipped with liquid level indicators and means for sampling and draining the liquid. The angle of inclination to vertical shall not exceed 30 degree.

v) Oil in oil-filled bushings shall meet the requirements of the transformer oil standards.

vi) Bushing rated for 400A and above shall have non-ferrous flanges 7 hardware.

vii) Fittings made of steel or malleable iron shall be galvanized.

viii) Bushing shall be so located on the transformers that full flashover strength will be utilized. Minimum clearances as required for the BIL shall be realized between live parts and live parts to earthed structures.

ix) All applicable routine and type tests certificates of the bushings shall be furnished for approval.
x) Bushing shall be supplied with bi-metallic terminal connector/ clamp/ washers suitable for fixing to bushing terminal and the PURCHASER'S specification conductors. The connector/ clamp shall be rated to carry the bushing rated current without exceeding a temperature rise of 55°C over an ambient of 50°C. The connector/clamp shall be designed to be corona free at the maximum rated line to ground voltage.

xi) Bushing of identical voltage rating shall be interchangeable.

xii) The insulation class of high voltage neutral bushing shall be properly coordinated with the insulation class of the neutral of the low voltage winding.

xiii) Each bushing shall be so coordinated with the transformer insulation that all flashover will occur outside the tank.

7.9.2. Protection and Measuring Devices

i) Oil Conservator Tank

a) The Conservator tank shall have adequate capacity between highest and lowest visible levels to meet the requirement of expansion of the total cold oil volume in the transformer and cooling equipment.

b) The conservator tank shall be bolted into position so that it can be removed for cleaning purposes.

c) The conservator shall be fitted with magnetic oil level gauge with low level electrically insulated alarm contact.

d) Plain conservator fitted with silica gel breather.

ii) Pressure Relief Device.

The pressure relief device provided shall be of sufficient size for rapid release of any pressure that may be generated in the tank and which may result in damage of the equipment. The device shall operate at a static pressure of less than the hydraulic test pressure of transformer tank. It shall be mounted direct on the tank. A pair of electrically insulated contact shall be provided for alarm and tripping.

iii) Buchholz Relay

A double float type Buchholz relay shall be provided. Any gas evolved in the transformer shall collect in this relay. The relay shall be provided with a test cock suitable for a flexible pipe connection for checking its operation. A copper tube shall be connected from the gas collector to a valve located about 1200mm above ground level to facilitate sampling with the transformer in service. The device shall be provided with two electrically independent potential free contacts, one for alarm on gas accumulation and the other for tripping on sudden rise of pressure.

iv) Temperature Indicator

a) Oil temperature Indicator (OTI)

The transformers shall be provided with a mercury contact type thermometer with 150mm dial for top oil temperature indication. The thermometer shall have adjustable, electrically independent potential free alarm and trip contacts. Maximum reading pointer and resetting device shall be
mounted in the local control panel. A temperature sensing element suitably located in a pocket on
top oil shall be furnished. This shall be connected to the OTI by means of capillary tubing.
Accuracy class of OTI shall be ± 1% or better. One No electrical contact capable of operating
at 5 A AC at 230 volt supply.

b) **Winding temperature indicator (WTI)**

A device for measuring the hot spot temperature of the winding shall be provided. It shall comprise
the following.

i) Temperature sensing element
ii) Image Coil.
iii) Mercury contacts
iv) Auxiliary CTS. If required to match the image coil, shall be furnished and mounted in the
local control panel.
v) 150mm dial local indicating instrument with maximum reading pointer mounted in local
panel and with adjustable electrically independent ungrounded contacts, besides that required
for control of cooling equipment, one for high winding temperature alarm and one for trip.
vi) Calibration device.

vii) Two number electrical contact each capable of operating at 5 A ac at 230 Volt supply.

7.9.3. **Oil preservation Equipment**

7.9.3.1. **Oil Sealing**

The oil preservation shall be diaphragm type oil sealing in conservator to prevent oxidation and
contamination of oil due to contact with atmospheric moisture.

The conservator shall be fitted with a dehydrating filter breather. It shall be so designed that.

i) Passage of air is through a dust filter and silica gel
ii) Silica gel is isolate from atmosphere by an oil seal.
iii) Moisture absorption indicated by a change in colour of the crystals of the silica gel can be
easily observed from a distance.
iv) Breather is mounted not more than 1400mm above rail top level.

7.10. **MARSHALLING BOX**

i) Sheet steel, weather, vermin and dust proof marshalling box fitted with required glands,
locks, glass door, terminal Board, heater with switch, illumination lamp with switch, water-tight
hinged and padlocked door of a suitable construction shall be provided with each transformer to
accommodate temperature indicators, terminal blocks etc. the box shall have sloping roof and
the interior and exterior painting shall be accordance with the specification. Padlock along with
duplicate key shall be supplied for marshalling box. The degree of protection shall be IP-55 or
better.

ii) The schematic diagram of the circuitry inside the marshalling box be prepared and fixed
inside the door under a prospene sheet.

iii) The marshalling box shall accommodate the following equipment:

a) Temperature indicators.
b) Space for accommodating control & protection equipment in future for the cooling fan (for ONAF type cooling may be provided in future).

c) Terminal blocks and gland plates for incoming and outgoing cables.
All the above equipments except c) shall be mounted on panels and back of panel wiring shall be used for inter connection. The temperature indicators shall be so mounted that the dials are not more than 1600 mm from the ground level and the door (s) of the compartment(s) shall be provided with glazed window of adequate size. The transformer shall be erected on a plinth which shall be 2.5 feet above ground level.

iii) To prevent internal condensation a metal clad heater with thermostat shall be provided. The heater shall be controlled by a MCR of suitable rating mounted in the box. The ventilation louvers suitably padded with felt shall also be provided. The louvers shall be provided with suitable felt pads to prevent ingress of dust.

iv) All incoming cables shall enter the kiosk from the bottom and the gland plate shall not be less than 450 mm from the base of the box. The gland plate and associated compartment shall be sealed in suitable manner to prevent the ingress of moisture from the cable trench.

v) The control connection, wiring etc shall be as per clause 3.15 of this specification.

7.11 OFFLOAD TAPCHANGER.

i) The transformers shall be provided with off-load taps.

ii) The Transformer with off load tap changing gear shall have taps running from + 5% to – 10% in 6 equal steps of 2.5% each on HV winding for voltage variation

iii) The tap changing switch shall be located in a convenient position so that it can be operated from ground level. The switch handle shall be provided with locking arrangement along with tap position indication thus enabling the switch to be locked in position.

iv) Suitable arrangement shall be provided to for local electrical & local manual operation. Provisions in the circuit shall be kept for gang operation of the tap changer with the tap changers of the transformers which may be added in parallel to this transformer in future.

v) An out of step device shall be provided for each transformer which shall be arranged to prevent further tap changing when transformer in a group operating in parallel control are operated out of step.

7.12 FITTINGS AND ACCESSORIES;

The following fittings and accessories shall be provided on the transformers:

i) Conservator with isolating valves oil filling hole with cap and drain valve. The conservator vessel shall be filled with constant oil pressure diaphragm oil sealing system.

ii) Magnetic type oil level gauge (150 mm dia) with low oil level alarm contacts.

iii) Prismatic/toughened glass oil level gauge.

iv) Silica gel breather with oil seal and connecting pipe complete with first fill of activated silicagel or Aluminium mounted at a level of 1300 mm above ground level.

v) A double float type Buchholz relay with isolating valve. Bleeding pipe and a testing cock the test cock shall be suitable for a flexible (pipe connection for checking its operation). A 5 mm dia Copper pipe shall be connected from the test cock to a valve located at a suitable height above ground level to facilitate sampling of gas with the transformer in service. Interconnection between gas collection box and relay shall also be provided. The device shall be provided with
two electrically independent ungrounded contacts one for alarm on gas accumulation and the other for tripping on sudden oil surge. These contacts shall be wired up to transformer marshalling box. The relay shall be provided with shut of valve on the conservator side as well as on the tank side.

vi) Pressure relief devices (including pressure relief valve) and necessary air equalizer connection between this and the conservator with necessary alarm and trip contacts.

vii) Air release plugs in the top cover.

viii) Inspection cover access holes with bolted covers for access to inner ends of bushing etc.

ix) Winding temperature (a hot spot) indicating device for local mounting complete in all respects. Winding temperature indicator shall have three set of contacts to operate at different settings.
   a) To provide winding temperature high alarm.
   b) To provide temperature too high trip.

x) Dial thermometer with pocket for oil temperature indicator with one set of alarm and one set of trip contacts and maximum reading pointer.

xi) Lifting eyes or lugs for the top cover core and coils and for the complete transformer.

xii) Jacking pads.

xiii) Haulage lugs.

xiv) Protected type mercury/alcohol in glass thermometer and a pocket to house the same.

xv) Top and bottom filter valves on diagonally opposite ends with pad locking arrangement on both valves.

xvi) Top and bottom sampling valves.

xvii) Drain valve with pad locking arrangement.

xviii) Rating and connection diagram plate.

xix) Two numbers tank ear thing terminals with associated nuts and bolts for connections to purchaser’s grounding strip.

xx) Bi-directional flagged rollers with locking and bolting device.

xxi) Marshalling Box (MB).

xxii) Shut off valve on both sides of flexible pipe connections between radiator bank and transformer tank.

xxiii) Cooling Accessories:

   a) Requisite number of radiators provided with:
      - One shut off valve on top,
      - One shut off valve at bottom
      - Air release device on top
      - Drain and sampling device at bottom
      - Lifting lugs.

   b) Air release device and oil drain plug on oil pipe connectors:

xxiv) Terminal marking plates for current transformer and main transformer.

   a) Off load tap changer.

xxv) Oil preservation equipment.

xxvi) Oil temperature indicator.
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Note: (i) The fittings listed above are indicative and any other fittings which are generally required for satisfactory operation of the transformer are deemed to be included in the quoted price of the transformer.

(ii) The contacts of various devices required for alarm and trip shall be potential free and shall be adequately rated for continuous making and breaking current duties as specified.

7.13 CONTROL CONNECTIONS AND INSTRUMENT AND WIRING AT TERMINAL BOARD AND FUSES:

i) Normally no fuses shall be used anywhere instead of fuses MCB’s (both in AC & DC circuits) shall be used. Only in cases where a MCB can not replace a fuse due to system requirements a HRC fuse can be accepted.

ii) All wiring connections, terminal boards, fuses MCB’s and links shall be suitable for tropical atmosphere. Any wiring liable to be in contact with oil shall have oil resisting insulation and the bare ends of stranded wire shall be seated together to prevent seepage of oil along the wire.

iii) Panel connections shall be neatly and squarely fixed to the panel. All instruments and panel wiring shall be run in PVC or non-rusting metal cleats of the compression type. All wiring to a panel shall be taken from suitable terminal boards.

iv) Where conduits are used, the runs shall be laid with suitable falls, and the lowest parts of the run shall be external to the boxes. All conduit runs shall be adequately drained and ventilated conduits shall not be run at or below ground level.

v) When 400 volt connections are taken through junction boxes or marshalling boxes, they shall be adequately screened and 400 volts Danger Notice must be affixed to the cut side of the junction boxes or marshalling box. Proper colour code for Red Yellow Blue wires shall be followed.

vi) All box wiring shall be in accordance with relevant I.S.I. All wiring shall be of stranded copper (48 strands) of 1100 volt grade and size not less than 2.5 sq.mm.

vii) All wires on panels and multi core cables shall have ferrules, for easy identifications, which bear the same number at both ends, as indicated in the relevant drawing.

viii) At those points of interconnection between the wiring carried out by separate contractors, where a change of number cannot be avoided double ferrules shall be provided on each wire. The change of numbering shall be shown on the appropriate diagram of the equipment.

ix) The same ferrule number shall not be used on wires in different circuits on the same panels.

x) Ferrules shall be of white insulating material and shall be provided with glossy finish to prevent the adhesion of dirt. They shall be clearly and durably marked in black and shall not be affected by dampness or oil.

xi) Stranded wires shall be terminated with tinned brass Courtney terminals, claw washers or crimped tubular lugs. Separate washers shall be seated to the size of the wire terminated. Wiring shall in general, be accommodated on the sides of the box and the wires for each circuit shall be separately grouped. Back of panel wiring shall be arranged so that access to the connecting items of relays and other apparatus is not impeded.

xii) All circuits in which the voltage exceeds 125 volts, shall be kept physically separated from the remaining wiring. The function of each circuit shall be marked on the associated terminal boards.

xiii) Where apparatus is mounted on panels, all metal cases shall be separately earthed by means of stranded (48 no.) copper wire of size having a cross section of not less than 2 sq. mm where strip
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is used, the joints shall be sweated. The copper wire shall have green colored insulation for earth connections.

xiv) All wiring diagram for control and relay panel shall preferably be drawn as viewed from the back and shall shown the terminal boards arranged as in services.

xv) Terminal block rows should be spaced adequately not less than 100 mm apart to permit convenient access to external cables and terminations.

xvi) Terminal blocks shall be placed with respect to the cable gland ( at a minimum distance of 200mm) as to permit satisfactory arrangement of multi core cable tails.

xvii) Terminal blocks shall have pairs of terminals for incoming and outgoing wires. Insulating barriers shall be provided between adjacent connections. The height of the barriers and the spacing between terminals shall be such as to give adequate protection while allowing easy access to terminals. The terminals shall be adequately protected with insulating dust proof covers. No live metal shall be exposed at the back of the terminal boards. CT terminals shall have shunting facilities. The terminals for CTs should have provision to insert banana plugs and with isolating links.

xviii) All interconnecting wiring as per the final approved scheme between accessories of transformer and marshalling box is included in the scope of this specification and shall be done by the Transformer supplier.

xix) The schematic diagram shall be drawn and fixed under a transparent perspex plate on the inner side of the marshalling box cover.

xx) To avoid condensation in the Marshalling Box a space heater shall be provided with an MCB and thermostat.

xii) Suitable MV, CFl light shall be provided in the Marshalling Box for lightning purpose.

7.14 RADIO INTERFERENCE AND NOISE LEVEL;

Transformers shall be designed with particular care to suppress at least the third and fifth harmonic voltages so as to minimize interference with communication circuits. Transformer noise level when energized at normal voltage and frequency shall be as per NEMA stipulations.

8. INSPECTION AND TESTING;

(i) The Contractor shall carry out a comprehensive inspection and testing programme during manufacture of the transformer. An indicative in inspection is given under Clause No.4.1. This is however not intended to form a comprehensive programme as it is contractor’s responsibility to draw up and carry out such a programme duly approved by the purchaser.

(ii) The contractor shall carry out type tests and routine tests on the transformers.

(iii) Only one no of transformer of each rating will be subjected to type test. The charges for conducting each of type tests shall be included in the bid price and no separate type test charges shall be paid. The purchaser reserves the right to conduct any or all type tests at CPRI/National Govt. Approved Laboratory, if the type tests were not conducted earlier on transformers of the same rating and design.

(iv) The pre shipment checks shall also be carried out by the contractor.
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(v) The requirements on site tests are as listed in the specifications.

(vi) Certified test report and oscillograms shall be furnished to the purchaser consultants for evaluation as per the schedule of distribution of documents. The contractor shall also evaluate the test results and rectify the defects in the equipment based on his and the purchaser’s evaluations of the tests without any extra charges to the purchaser. Manufacturer’s test certificate in respect of all associated auxiliary and ancillary equipment shall be furnished.

(vii) The bidder shall state in his proposal the testing facilities available at his works. In case full testing facilities are not available the bidder shall state the method proposed to be adopted so as to ascertain the transformer characteristics corresponding to full capacity.

8.1 INSPECTION:

i) Tank and conservator:

a) Inspection of major welds.
b) Crack detection of major strength weld seams by dye penetration test.
c) Check for correct dimensions between wheels demonstrate turning of wheels through 90° and further dimensional check.
d) Leakage test of the conservator.

ii) Core:

a) Sample testing of core materials for checking specific loss properties magnetization characteristics and thickness.
b) Check on the quality of varnish if used on the stampings.
c) Check on the amount of burrs.
d) Visual and dimensional check during assembly stage.
e) Check on completed core for measurement of iron loss determination of maximum flux density.
f) Visual and dimensional checks for straightness and roundness of core thickness of limbs and suitability of clamps.
g) High voltage DC test (2KV for one minute) between core and clamps.

iii) Insulating material.

a) Sample check for physical properties of materials.
b) Check for dielectric strength.
c) Check for the reaction of hot oil on insulating materials.

iv) Winding:

a) Sample check on winding conductor for mechanical and conductivity.
b) Visual and dimensional checks on conductor for scratches, dent mark etc.
c) Sample check on insulating paper for PH value, electric strength.
d) Check for the bonding of the insulating paper with conductor.
e) Check and ensure that physical condition of all materials taken for windings is satisfactory and free of dust.
f) Check for absence of short circuit between parallel strands.

v) Checks before drying process:

a) Check condition of insulation on the conductor and between the windings.
b) Check insulation distance between high voltage connections between high voltage connection cables and earth and other live parts.
c) Check insulating distances between low voltage connections and earth and other parts.
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d. Insulating test for core earthing.

v) Check during drying process:
   b) Check for completeness of drying.

vii) Assembled Transformer:
   a. Check completed transformer against approved outline drawing; provision for all fittings, finish level etc.
   b. Jacking test on the assembled Transformer.

viii) Oil:

   All standard test in accordance with IS: 335 shall be carried out on Transformer oil sample before filling in the transformer.

ix) Test report for bought out items:

   The contractor shall submit the test reports for all bought out / sub contracted items for approval.
   a) Buchholz relay.
   b) Sudden pressure rise relay on Main Tank.
   c) Winding temperature indicators (for TX capacity > 10 MVA)
   d) Oil temperature indicators.
   e) Bushings
   f) Bushing current transformers in neutral (if provided)
   g) Marshalling box
   h) Oil load tap changer
   i) Any other item required to complete the works.
   j) Porcelain, bushings, bushing current transformers, wherever provided, winding coolers, control devices, insulating oil and other associated equipment shall be tested by the contractor in accordance with relevant IS. If such requirement is purchased by the contractor on a sub contract he shall have them tested to comply with these requirements.

8.2 FACTORY TESTS:

   i) All standards routine tests in accordance IS: 2026 with dielectric tests corresponding as per latest amendments to IS:2026 shall be carried out.
   ii) All auxiliary equipment shall be tested as per the relevant IS. Test certificates shall be submitted for bought out items.
   iii) High voltage withstand test shall be performed on auxiliary equipment and wiring after complete assembly.

   iv) Following additional routine tests shall also be carried out on each transformer.

      a) Magnetic circuit test
         Each core shall be tested for 1 minute at 2000 volt DC
      b) Oil leakage test on transformer.

8.2.1 Type test:

   The transformer shall be subjected to the following type tests particularly short circuit and impulse withstand tests at CPR/NI National Govt. approved laboratory at the discretion of the purchaser if these
tests were not conducted on the transformers of the offered design and rating at the cost of the manufacturer.

1. Tan delta measurement and capacitance of each winding to earth (with all other windings earthed) and between all windings connected together to earth.
3. Temperature rise test.
5. Tank vacuum test.
6. Tank pressure test.
7. Lightning impulse withstand test for line and neutral terminal.

The above type tests will be conducted by the supplier at their own cost if the design/test result of the type tested transformer differs from those of the offered transformer as per their bid.

8.2.2. STAGE INSPECTION

The supplier shall offer the core, windings & tank of each transformer for inspection by the purchaser's representative(s) during stage inspection. All the measurements like diameter, window height, leg centre, stack height, stack thickness, thickness of laminations etc for core assembly, conductor size, insulation thickness, I.D., O.D., winding height, major & minor insulations for both H.V. & L.V. windings, length, breadth, height & thickness of plates of Transformer tank, the quality of fittings & accessories will be taken / determined. The supplier can offer for final inspection of the transformers subject to clearance of the stage inspection report by the purchaser.

8.2.3. Routine Tests

Transformer routine tests shall include tests stated in latest issue of IS: 2026 (Part – 1). These tests shall also include but shall not be limited to the following:

(i) Measurement of winding DC resistance.
(ii) Voltage ratio on each tapping & check of voltage vector relationship.
(iii) Impedance voltage at all tappings.
(iv) Magnetic circuit test as per relevant IS or CBIP manual or latest standard being followed.
(v) Load losses at normal tap & extreme taps.
(vi) No load losses & no load current at rated voltage & rated frequency, also at 10% to 121% of rated voltage in steps.
(vii) Absorption index i.e. insulation resistance for 15 seconds & 60 seconds (r 60/ r 15) & polarization index i.e. Insulation Resistance for 10 minutes & one minute (R 10 min / R 1 min).
(viii) Induced over voltage withstand test.
(ix) Separate source voltage withstand test.
(x) Tan delta measurement & capacitance of each winding to earth (with all other windings earthed) & between all windings connected together to earth.
(xi) Measurement of zero sequence impedance.

(xiii) Auxiliary circuit tests

(xiv) Oil BDV tests

(xv) Measurement of neutral unbalance current which shall not exceed 2% of the full rated current of the transformer.

(xvi) Magnetic balance test

(xvii) Leakage test.

Six (6) set of certified test reports & oscillographs shall be submitted for evaluation prior to dispatch of the equipment. The contractor shall also evaluate the test result & shall correct any defect indicated by his & Purchaser’s evaluation of the tests without charge to the Purchaser.

8.4 TANK TESTS

(a) Oil leakage test:
The tank & oil filled compartments shall be tested for oil tightness completely filled with air or oil of viscosity not greater than that of insulating oil conforming to IS : 335 at the ambient temperature & applying a pressure equal to the normal pressure plus 35 KN/m² measured at the base of the tank. The pressure shall be maintained for a period of not less than 12 hours of oil & one hour for air & during that time no leak shall occur.

(b) Pressure test
Where required by the purchase, one transformer tank of each size together with its radiator, conservator vessel & other fittings shall be subjected to a pressure corresponding to twice the normal head of oil or to the normal pressure plus 35 KN/m² whichever is lower, measured at the base of the tank & maintained for one hour.

(c) Vacuum Test
One transformer tank of each size shall be subjected to the vacuum pressure of 60 mm of mercury. The tanks designed for full vacuum shall be tested at an internal pressure of 3.33 KN/m² (25 mm of mercury) for one hour. The permanent deflection of flat plates after the vacuum has been released shall not exceed the value specified in C.B.I.P. manual on Transformer (Revised 1999) without affecting the performance of the transformer.

8.5 PRE-SHIPMENT CHECK AT MANUFACTURERS WORKS

i) Check for proper packing & preservation of accessories like radiators, bushings, explosions vent, dehydrating breather, rollers, bushholz relay, control cubicle connecting pipes & conservator etc.

ii) Check for proper provision of bracing to arrest the movement of core & winding assembly inside the tank.

iii) Gas tightness test to conform tightness.

8.6 INSPECTION AND TESTING AT SITE
The Engineer authorized from CESU along with the contractor's site engineer shall carry out detailed inspection covering areas right from the receipt of material up to commissioning stage. An indicative program of inspection as envisaged by the Engineer is given below.

8.6.1. receipt & Storage Checks
   i)        Check & record conditions of each package visible parts of the transformers etc. for any damage.
   ii)       Check & record the gas pressure in the transformer tank as well as in the gas cylinder.
   iii)      Visual check of core & coils before filling up with oil & also check condition of core & winding in general.

8.6.2. Installation Checks
   i)        Inspection & performance testing of accessories like tap changer etc.
   ii)       Check choking of the tubes of radiators
   iii)      Test on oil samples taken from main tank top & cooling system. Samples should be taken only after the oil has been allowed to settle for 24 hours.
   iv)       Check the whole assembly for tightness, general appearance etc.
   v)        Oil leakage tests.

8.6.3. Pre-Commissioning Tests

After the transformer is installed, the following pre-commissioning tests & checks shall be done before putting the transformer in service.

   i)        Dry out test
   ii)       Megger test
   iii)      DC Resistance measurement of windings
   iv)       Ratio test on all taps
   v)        Phase relationship test (Vector grouping test)
   vi)       Buchholz relay alarm & surge operation test
   vii)      Low oil level (in conservation) alarm
   viii)     Temperature Indicators
   ix)       Marshalling kiosk
x) Protective relays

xi) Magnetising current

xii) Tests on OLTC

8.6.4. The following additional checks shall be made:

i) All oil valves are incorrect position closed or opened as required

ii) All air pocket are cleared

iii) Thermometer pocket are filled with oil

iv) Oil is at correct level in the bushing, conservator, diverter switch & tank etc.

v) Earthing connections are made.

vi) Colour of Silica gel is blue

vii) Bushing arcing horn is set correctly & gap distance is recorded

viii) CT polarity & ratio is correct.

8.7. PERFORMANCE

The performance of the transformer shall be measured on the following aspects.

i) The transformer shall be capable of being operated without danger on any tapping at the rated KVA with voltage variations & ±10% corresponding to the voltage of the tapping.

ii) Radio interference & Noise level

iii) The transformer shall be designed with particular attention to the suppression of third & fifth harmonics so as to minimize interference with communication circuits.

8.8. FAULT CONDITIONS

a) The transformer shall be capable of withstanding for two(2) seconds without damages any external short circuit to earth

b) Transformer shall be capable of withstanding thermal & mechanical stresses conveyed by symmetrical or asymmetrical faults on any winding. This shall be demonstrated through calculation as per IS : 2026.

c) Transformer shall accept, without injurious heating, combined voltage & frequency fluctuation which produce the 125% over fluxing condition for one minute.

Certified test report & oscillograms shall be furnished to the Purchaser / Consultant for evaluation as per the schedule of distribution of documents. The Contractor shall also evaluate the test results & rectify the defects in the equipment based on his & the Purchaser's evaluations of the tests.
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without any extra charges to the Purchaser. Manufacturer’s test Certificates in respect of all associated auxiliary & ancillary equipment shall be furnished.

The bidder shall state in his proposal the testing facilities available at his works. In case full testing facilities are not available, the bidder shall state the method proposed to be adopted so as to ascertain the transformer characteristics corresponding to full capacity testing.

8.9. WITNESSING OF TESTS AND EXCESSIVE LOSSES

i) The purchaser & or his representative reserve the right to witness any or all test or to accord waiver at its soil discretion.

ii) The Purchaser reserves the right to reject the transformer if losses exceed the maximum specified as per Clause No 2 SPECIFIC TECHNICAL REQUIREMENTS (STANDARD CONDITIONS), item-37 & 38 of this specification or if temperature rise of oil & winding exceed the values specified at item-26 of the above clause.

9. CAPITALISATION OF LOSSES AND LIQUIDATED DAMAGES FOR EXCESSIVE LOSSES

9.1. LOSSES:

Transformer with lower losses shall be preferred. The bidder shall indicate the values of load and no load losses of the transformer in his bid.

9.2. CAPITALISATION OF LOSSES

for total cost evaluation, the capitalized cost of losses will be taken into account as specified in S.C.C. of this bid document.

However, Liquidated damages for non-performance for transformers shall be recovered from the contractor in case he is unable to achieve the quoted guaranteed figures at the rate equivalent to the double of the rate considered for loss evaluation or else the transformer(s) will be rejected outrightly.

10. SPARE PARTS

In case the manufacturer goes out of production of spare parts, then he shall make available the drawings of spare parts & specification of materials at no extra cost to the Purchaser to fabricate or procure spare parts from other sources.

10.1. Mandatory spare Parts

The suppliers shall provide the following mandatory spares for each of Transformer supplied.

1. H.V. & L.V. bushing - 1 No.
2. Bimetallic connector – 1 complete set.

10.2. INSTRUCTIONS MANUAL

Eight sets of the instruction manuals shall be supplied at least four (4) weeks before the actual dispatch of equipment. The manuals shall be in bound volumes & shall contain all the drawings & information required for erection, operation & maintenance of the transformer

The manuals shall include amongst other, the following particular:
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a) Marked erection prints identifying the components, parts of the transformer as dispatched with assembly drawings.

b) Detailed dimensions, assembly & description of all auxiliaries.

c) Detailed views of the core & winding assembly, winding connections & tapings tap changer construction etc. These drawings are required for carrying out overhauling operation at site.

d) Salient technical particulars of the transformer.

e) Copies of all final approved drawings.

f) Detailed O&M instructions with periodical check lists & Performa etc.

10.3. COMPLETENESS OF EQUIPMENT

All fitting & accessories, which may not be specifically mentioned in the specification but which are necessary for the satisfactory operation of the transformer, shall be deemed to be included in the specification & shall be furnished by the supplier without extra charges. The equipment shall be complete in all details whether such details are mentioned in the specification or not, without any financial liability to the Purchaser under any circumstances.

TOOLS AND TACKLES

All the necessary tools & tackles required for normal operation & maintenance of the transformers shall be supplied by the Contractor.

COMMISSIONING

The equipment shall be commissioned as per CBIP manual, IS: 10028 & manufacturer's recommendations. All the related drawings & manuals shall be pre-requisite for release of final payment.

NON COMPLIANCE SCHEDULE

On this schedule the bidder shall provide a list of non compliance with this specification, documenting the effects that such non compliance is likely to have on the equipment's life & operating characteristics. Each Non Compliance shall refer to the relevant clause of the specification.

Where there are no deviations from specification, the bidder shall so indicate by stating “No deviations” in this schedule.

TEST CERTIFICATES SCHEDULE

On this schedule a list of the test certificates included with the bid shall be provided. The list should include type test certificates & sample routine test reports. Each certificate listed shall be referred to the relevant specification clause & item of equipment to which the test applies.