Two Part DCB Tender is invited through e-tendering system by Dy. General Manager (T) CM, Room No. 504, 5th Floor, Shakti Sadan, Kotla Road, New Delhi-02 from the experienced companies/ contractors, in the relevant business for the following works:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Tender No.</th>
<th>Name of Work</th>
<th>Earnest Money Deposit (EMD) (Rs.)</th>
<th>Tender Fee</th>
<th>Work completion period</th>
<th>Schedule Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>T17R220136</td>
<td>DCB Tender of Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.</td>
<td>Rs.1,46,68,407.59/- (Rs. One crore forty six lacs sixty eight thousand four hundred seven and fifty nine paise only)</td>
<td>Rs. 10,000/- (Rs. Ten Thousand Only)</td>
<td>16 months</td>
<td>Date and Time of Start of downloading of the bidding document 09.01.2018 13:00 Hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date and Time of Close of downloading of the bidding document 02.02.2018 10:30 Hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date and time of start of submission of bids 09.01.2018 13:00 Hrs</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Date and Time of Close of submission of bids 02.02.2018 10:30 Hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date and Time of opening of Techno-Commercial part of bids (Part-I) 02.02.2018 11:30 Hrs</td>
</tr>
</tbody>
</table>

Note- Complete Tender documents can be downloaded from the websites of Delhi Govt. https://www.govtprocurement.delhi.gov.in (Tender ID: 2017_DTL_142721_1) and to be submitted through e-Tendering Process only. The cost of tender document i.e.Rs.10,000/- in the form of Pay Order/DD payable in favour of Delhi Transco Limited is to be submitted along with the offer and the detail of the same (D.D./P.O. No., Amount, Name of the Bank ) should be mentioned on the face of envelop.

Designation/ Deptt.-DGM (T) CM,  
Address with Fax No: Room No. 504, 5th Floor, Shakti Sadan,  
Kotla Road, New Delhi-02.  
Ph. No. 23230026 & Fax No.23234640

Date: 08.01.2018
BIDDING DOCUMENT

FOR

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)

VOLUME - I, II & III

TENDER NO: T17R220136
BIDDING DOCUMENT

FOR

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)
VOLUME - I
CONDITIONS OF CONTRACT
<table>
<thead>
<tr>
<th>S. No.</th>
<th>CONTENTS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>SECTION</td>
<td>INVITATION TO BID (INV)</td>
</tr>
<tr>
<td>2.</td>
<td>SECTION</td>
<td>INSTRUCTIONS TO BIDDERS (INB)</td>
</tr>
<tr>
<td>3.</td>
<td>SECTION</td>
<td>CONDITIONS OF CONTRACT (CC)</td>
</tr>
<tr>
<td>4.</td>
<td>SECTION</td>
<td>FORM &amp; PROCEDURE (F&amp;P)</td>
</tr>
</tbody>
</table>
SECTION - INV

INVITATION TO BID

DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)

VOLUME - I
CONDITIONS OF CONTRACT
SECTION – I
INVITATION TO BID (INV)
(DOMESTIC COMPETITIVE BIDDING)

WEB NOTIFICATION

Tender is invited in Two-part Bid system (i.e. Technical bid and Price bid) through e-procurement portal of Delhi Govt. by DGM (T) CM, Room No.-504, Fifth Floor, Shakti Sadan, Kotla Road, New Delhi – 110002, from eligible bidders who have registered with e-procurement portal of GNCTD and have obtained digital signature.

<table>
<thead>
<tr>
<th>Tender Name</th>
<th>Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tender Enquiry No.</td>
<td>T17R220136</td>
</tr>
<tr>
<td>Bid Security (BS) in Rs.</td>
<td>Rs.1,46,68,407.59/- (Rs. One crore forty six lacs sixty eight thousand four hundred seven and fifty nine paisa only)</td>
</tr>
<tr>
<td>Tender Fee</td>
<td>Rs. 10,000/- (Rs. Ten Thousand Only) Non Refundable</td>
</tr>
<tr>
<td>Bid Validity</td>
<td>180 days from the date of bid opening.</td>
</tr>
<tr>
<td>Estimated Amount (in Rs.)</td>
<td>Rs. 73,34,20,379.43/- (Rs. Seventy three Crore thirty four Lac twenty thousand three hundred seventy nine and forty three paisa Only)</td>
</tr>
<tr>
<td>Completion Period</td>
<td></td>
</tr>
<tr>
<td>S.No</td>
<td>Activities</td>
</tr>
<tr>
<td>Completion of Delivery at site</td>
<td>Completion of Erection testing &amp; Commissioning</td>
</tr>
</tbody>
</table>

Taking Over by the Employer upon successful Completion of:

(I) Transformer Pkg.:

a) 2x160MVA, 220/66/11kV, 3-Ph, Transformers at Najafgarh S/S | 9 months | 12 months |
160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

General requirements for invitation of bids are as under:

1.0 **DELHI TRANSCO LIMITED** invites tenders for the aforesaid package, in Two-part Bid system (i.e. Techno-Commercial and Price bid) through e-procurement portal from eligible bidders who are registered at **e-procurement portal of Delhi Govt. website** i.e. [http://govtprocurement.delhi.gov.in](http://govtprocurement.delhi.gov.in) and have obtained digital signature.

1.1 Bidding Documents are available for downloading date and time mentioned in the web notification.

1.2 All bids must be accompanied by Tender Cost of amount mentioned in the web notification.

For details please visit web site [www.dtl.gov.in](http://www.dtl.gov.in) (unique No:………………………….) Tender can only be submitted on e-tendering portal of Delhi Govt. website [http://govtprocurement.delhi.gov.in](http://govtprocurement.delhi.gov.in) or may contact office of DGM (T) CM, Room No. -504, Fifth Floor, Shakti Sadan, Kotla Road, New Delhi – 110002, Ph. 011-23230026, Fax No. 011-23234640, Email : sc.jangir@dtl.gov.in

**TENDER No. T17R220136**

**Invitation for Bids (INV) in Two Parts for the scope of work:-**

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

<table>
<thead>
<tr>
<th><strong>PARTiculars</strong></th>
<th><strong>Number of Transformers</strong></th>
<th><strong>Delivery Schedule</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>b)</strong> 1x160MVA, 220/66/11kV, 3-Ph, Transformers at Kanjhiwala S/S</td>
<td>9 months</td>
<td>12 months</td>
</tr>
<tr>
<td><strong>c)</strong> 2x160MVA, 220/66/11kV, 3-Ph, Transformers at Gopalpur S/S</td>
<td>11 months</td>
<td>14 months</td>
</tr>
<tr>
<td><strong>d)</strong> 2x160MVA, 220/66/11kV, 3-Ph, Transformers at Budella GIS S/S</td>
<td>13 months</td>
<td>16 months</td>
</tr>
<tr>
<td><strong>e)</strong> 2x160MVA, 220/66/11kV, 3-Ph, Transformers at Sanjay Gandhi Transport Nagar GIS S/S</td>
<td>13 months</td>
<td>16 months</td>
</tr>
</tbody>
</table>

**Note:** The delivery schedule has been envised by employer to accommodate the facilities as per specific site requirement. However, for the purpose of LD, final commissioning date as per schedule specified in the CC for respective facility shall be the benchmark.
1.3 The submission of bids date and time has been mentioned in the web notification. Bids shall be received up to date and time mentioned in the web notification and Techno- Commercial Bid (Part-I) shall be opened on the same day at 11:30 Hrs through e-procurement portal of Delhi Govt. website i.e. http://govtprocurement.delhi.gov.in in the presence of Bidder’s representative who chose to attend at the address given below:-

Office of DGM (T) CM  
Delhi Transco Limited, Room No.-504, Fifth Floor,  
Shakti Sadan, Kotla Road  
New Delhi – 110002  
Phone Number: 011-23230026, Fax No. 011-23234640  
Email: sc.jangir@dtl.gov.in

1.4 In case any of the above dates are declared holiday/ closing day, these shall be extended to next working day.

1.5 The complete Bidding Documents including tender drawings are available on DTL website https://www.delhitransco.gov.in and Delhi Govt. website http://govtprocurement.delhi.gov.in

1.6 The Qualifying Requirements are given in the bidding document of the subject package. In addition to submission of scanned copies of mandatory documents through e-procurement portal, the bidder shall also submit (03) three copies of the bid in Book Bound form, clearly marking each “Original Bid” and “Copy of bid” including, the signed hard copies of all relevant pre-qualification documents being submitted in support of Bid (all Forms, Annexures etc. Experience certificate, supporting documents copies, type test reports, Guaranteed Technical Particulars and any other documents required as per the bidding document etc.) atleast one hour before the time of bid opening in the office of DGM (T) CM, Room No.-504, Fifth Floor, Shakti Sadan, Kotla Road, New Delhi – 110002 . In the event of any discrepancy between original and copy of the hard bid, the original shall govern. Also in the event of any discrepancy between online bidding documents and the hard copy of the bid, the online bid shall govern. The Price Bid (Part-II) shall not be submitted in hard copy and shall only be uploaded on e-portal of Delhi Govt. website.

1.7 All bids must be accompanied by Bid Security amount mentioned in the web notification as per cl. No. 23 of Section INB, Volume-I of the bidding document. The Scanned copy of Bid Security is to be submitted with online bid; however, the Bid Security in original shall be submitted in the office of DGM (T) CM, Room No.-504, Fifth Floor, Shakti Sadan, Kotla Road, New Delhi – 110002 , atleast one hour before the time of bid opening, failing which the bids shall be rejected.

1.8 The Techno- Commercial Bid (Part-I) so opened shall be evaluated and the date of opening of the Price Bid (Part-II) of the techno-commercially successful bidders shall only be communicated to all techno commercially successful bidders.

1.9 Delhi Transco Limited shall not be responsible for any postal delays in respect of request for issuance of bidding documents and/or dispatch of bidding documents and/or submission of bids.

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

2.1 All correspondence/communication regarding the NIT shall be made to: DGM (T) CM, Room No.-504, Fifth Floor, Shakti Sadan, Kotla Road, New Delhi – 110002 , Ph. 011-23230026, Fax No. 011-23234640, Email: sc.jangir@dtl.gov.in.
3.0 Integrity Pact must be submitted along with the bid in physical form at the address given at para 1.7 above.

3.1 Under the Integrity Pact Program (IPP), Sh. ............... shall be the Independent External Monitors (IEM) for the subject tender. Correspondence, if any, to the IEMs be addressed to the following:

Sh. ...............  
...................

(Subhash Jangir)  
DGM (T) CM
SECTION-INB
INSTRUCTION TO BIDDERS

A. INTRODUCTION

1.0 GENERAL INFORMATION

1.1 Delhi Transco Limited (hereinafter called ‘DTL’/ ‘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 “Bids can be submitted by firms from within India including company (ies) registered and incorporated in India as per Companies Act, 2013 barring foreign bidders/MNCs not registered and incorporated in India and those bidders with whom business is banned by DTL.”

2.0 QUALIFYING REQUIREMENTS OF BIDDERS

2.1 The Qualifying Requirements for the Bidders are given in Annexure-A (CC) to this Volume i.e., Conditions of Contract, Volume-I of the Bidding Documents.

2.2 The above stated requirements are a minimum and the Owner 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 the Owner, the qualification data is incomplete or the Bidder is found not qualified to satisfactorily perform the contract.

3.0 COST OF BIDDING

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

3.2 Tender fee shall be of the amount as specified in web notification in the form of DD/ Pay Order in favour of Delhi Transco Limited payable at New Delhi. The tender fee shall be submitted in the envelope of bid security as prescribed in the bidding documents. Tender fee shall be non refundable.

B. THE BIDDING DOCUMENTS

4.0 CONTENTS OF BIDDING DOCUMENT

4.1 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 Document is a compilation of the following sections:

Volume - I: Conditions of Contract
i) Invitation to Bid – Section INV
ii) Instructions to Bidders - Section INB
iii) Conditions of Contract - Section CC
iv) Forms and Procedures (F&P)
5.0 UNDERSTANDING OF BID DOCUMENTS

5.1 A prospective Bidder is expected to examine all instructions, forms, terms, specifications and all other information in the Bid documents and fully inform himself as to all the conditions and matters which may in any way affect the scope of work or the cost thereof. Failure to furnish all information required 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 A prospective Bidder finding discrepancies or omissions, in specifications and document or is in doubt as to the true meaning of any part; they shall at once make a request, in writing or by electronic media (hereinafter, the term cable is deemed to include Electronic Data Interchange (EDI) or telefax) at the Employer's mailing address indicated below interpretation/clarification, to the Owner. The owner, 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 the owner in writing. The Employer will respond in writing to any request for clarification or modification of the bidding documents that it receives within 15 days after appearing in the web site. Written copies of the owner’s response (including an explanation of the query but without identifying its source) will be uploaded on the website as the part of bidding documents.

Address of Employer, telephone, facsimile numbers & E-mail address:

Office of DGM (T) CM
Delhi Transco Limited, Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002 (INDIA)
Phone Number: 011-23230026, Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in

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

6.3 The Bidder is advised to visit and examine the site, where the facilities are to be installed and its surroundings and obtain for itself on its own responsibility, all information that may be necessary, for preparing the bid and entering into a contract for supply and installation of the facilities. The costs of visiting the site shall be at the Bidder's own expense.

6.4 The Bidder and any of its personnel or designated representative will be granted permission by the facilities incharge to enter upon its premises and lands for the purpose of such
inspection, but only upon the express condition that the Bidder, its personnel and designated representative will release and indemnify the facilities in charge and its personnel and designated representative from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.

7.0 AMENDMENT TO BIDDING DOCUMENT

7.1 At any time prior to the deadline for submission of bids, the owner may, for any reason, whether as its own initiative or in response to a clarification requested by a prospective Bidder, modify the bidding document by amendment(s).

7.2 Each Amendment will be posted on owners as well as on Delhi Govt. website. The owner will not be responsible for checking the website by the bidder for the same in time or otherwise. It will be considered that the information contained therein will have been taken into account by the Bidder in its bid.

7.3 In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the owner may, at its discretion, extend the deadline for the submission of bids.

7.4 Such amendments, clarification, 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

8.1 The bid prepared by the bidder and all correspondence and documents relating to the bid, exchanged by the owner and the bidder 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 specification. The owner 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 the owner. Neither any change in the time schedule of the contract nor any financial adjustments arising thereof shall be permitted by the owner, which are based on the lack of such clear information or its effect on the cost of the Works to the Bidder.

10.0 DOCUMENTS COMPRISING THE BID

10.1 The bidder shall complete the Bid form inclusive of Price Schedules, Technical Data requirements etc. furnished in the Bidding Documents, indicating for the goods to be supplied and services to be rendered, a brief description of goods and services, quantity and prices.
10.2 The bidder shall also submit documentary evidence to establish that the Bidder meets the Qualification Requirements (QR) as detailed in Conditions of Contract (CC).

10.3 The Tender fee and Bid Security shall be furnished in a separate cover in accordance with clause 3.2 & 23.0 of Section INB.

Each Bidder shall submit with its bid the following Attachments:

(a) **Attachment 1: Bid Security**
A bid security furnished in accordance with INB Clause 23.

(b) **Attachment 2: Power of Attorney**
A power of attorney, duly authorized by a Notary Public, indicating that the person(s) signing the bid has the authority to sign the bid and thus that the bid is binding upon the Bidder during the full period of its validity in accordance with INB Clause 25.

(c) **Attachment 3: Bidder's Eligibility and Qualifications**
In the absence of prequalification, documentary evidence that the Bidder is eligible to bid in accordance with Annexure-A, Section CC and is qualified to perform the contract if its bid is accepted.

The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall establish to the Employer's satisfaction that the Bidder has the financial, technical, production, procurement, shipping, installation and other capabilities necessary to perform the contract, and, in particular, meets the experience and other criteria outlined in the Annexure-A, Section CC.

Qualification requirements for bidders are enclosed as Annexure-A, Section CC.

(d) **Attachment 4: Subcontractors Proposed by the Bidder**

The Bidder shall include in its bid details of all major items of supply or services, that it proposes to purchase and shall give details of the name and nationality of the proposed Subcontractor, including vendors, for each of those items. Bidders are free to list more than one Subcontractor against each item of the facilities. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

Vendors hired by the erector or the manufacturer or the lead player, shall be selected on considerations of quality and economy and DTL reserves the right to seek information in relation to any such vendor proposed to be hired by the erector or manufacturer or lead player. Subletting of either whole or part of the contract by the contractor, hired by DTL shall not be permissible.

The Employer reserves the right to delete any proposed Subcontractor from the list prior to award of contract, and after discussion between the Employer and the Contractor, attachment-4 to the form of Contract Agreement shall be completed, listing the approved Subcontractors for each item.

(e) **Attachment 5: Commercial Deviations**
In order to facilitate evaluation of bids, deviations, if any, from the Terms & Conditions Commercial Deviations Specifications shall be listed in Attachment 5 for Techno commercial Bid.
(f) **Attachment 6: Deviation on Important condition.**
In order to facilitate evaluation of bids, deviations on Important Condition shall be listed in Attachment 6 for important condition of Bid.

(g) **Attachment 7: Technical Deviation.**
In order to facilitate evaluation of bids, deviations, if any on technical specifications shall be listed in Attachment 7 for Techno commercial Bid.

(h) **Attachment 8: Additional Information**
In order to facilitate evaluation of bids, if any additional Information on technical/commercial specifications shall be listed in Attachment 8 for Techno commercial Bid.

(i) **Attachment 9: Bought-out & Sub-Contracted Item**

(j) **Attachment 10: Work Completion Attachment**

(k) **Attachment 11: List of Special Tools & Tackles**

(l) **Attachment 12: Information regarding ex-employees of Employer in Bidder’s firm.**

(m) **Attachment 13: Deleted.**

(n) **Attachment 14: Price Adjustment Data**

(o) **Attachment 15: Guarantee Declaration**

(p) **Attachment 16: Integrity Pact**
*Integrity Pact (submission of Hard Copy in ‘Original’)*
The Bidder shall complete the accompanying Integrity Pact, which shall be applicable for bidding as well as contract execution, duly signed on each page by the person signing the bid and shall be returned by the Bidder in two (2) originals alongwith the Techno - Commercial Part in a separate envelope, duly superscripted with ‘Integrity Pact’. “The Bidder shall submit the Integrity Pact on a non judicial stamp paper of Rs. 100/-.

The required format for Integrity Pact shall be as per Attachment 16.

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

Integrity Pact must be submitted in physical form at the address given at INB 25.1 at or before the schedule time and date of opening of Techno-commercial part of the bid.

Bidder’s failure to submit the Integrity Pact duly signed in Original alongwith the Bid or subsequently pursuant to INB Sub-Clause 27.6 shall lead to outright rejection of the Bid.

(q) **Attachment 17: UNDERTAKING FOR ANTI PROFITEERING MEASURE**

(r) **Attachment 18: Checklist**
*(Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment)*

*It shall be the sole responsibility of bidder to provide the information based on the documents submitted by them.*
11.0 SCOPE OF THE PROPOSAL

11.1 The scope of the work covered under this transformer package shall be on the basis of a single Bidder’s responsibility, completely covering all the equipment specified under the section Project, Volume-II. It will include the following:-

a) Complete manufacture including shop testing.
b) Providing Engineering drawing, data, operational manual, etc for the Owner’s approval.
c) Packing and transportation from the manufacturer’s works to the site.
d) Receipt, storage, preservation and conservation of equipment at the site.
e) Pre-assembly, if any, erection, testing and commissioning of all equipment.
f) Reliability tests and performance and guarantee tests on completion of commissioning and
g) Furnishing of spares, if applicable.

The complete scope of work is defined in section project, Volume-II of this tender document.

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

a) **Price Basis and payments & Price Adjustment:** Clause 14 & 15, Section INB, Volume-I, and Conditions of Contract.
b) **Bid Security:** Clause 23.0, Section INB, Volume-I, conditions of contract.
c) **Contract Performance Guarantee:** Clause 43.0, Section INB, Volume-I, Conditions of Contract.
d) **Liquidated damage:** Sub-Clause 28.5, Section CC, Volume-I, Conditions of Contract.
e) **Guarantee:** Clause 13.0, Section CC, Volume-I, Conditions of Contract.
f) **Payment:** Clause 12.0, Section CC, Volume-I, Conditions of Contract.

However, the Bidders, wishing to propose deviations to any of the above provisions, must provide in the Commercial Deviations Attachment of Bid Form in their bid along with the cost of withdrawal of such deviations. If the deviation to any of these provisions is not priced, the bid will be rejected. The evaluated cost of the bid shall include, in addition to the cost described Price schedule, the cost of withdrawal of the deviations from the above provisions to make the bid fully compliant with these provisions.

Bidders are also required to quote the price for Commercial, contractual and Technical obligations outlined in the bidding document. If a Bidder wishes to make a deviation, such deviation shall be listed in deviation Attachment of Volume-III. The Bidder shall also provide additional price, if any, for withdrawal of the deviations. If the deviation to any of these provisions is not priced, the bid will be rejected.

At the time of Award of Contract, if so desired by the owner, the Bidder shall withdraw these deviations listed in commercial deviation Attachment of Bid Form in their Bid at the cost of withdrawal stated by him in the bid. In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid, his bid will be rejected and his bid security forfeited.

The owner’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 may be treated as incomplete and hence rejected
12.0 BID PRICE

12.1 The Bidder shall quote in the appropriate Attachment of Bid form lump-sum price for the entire scope of works (covered under the Bidding document) and also the unit rates of the goods and services.

12.2 The Bid price under the contract shall be on a firm price basis, unless otherwise specified in the conditions of contract.

12.3 The Bidder shall also furnish the price break-up in the appropriate Attachments of bid form to indicate the following:

i. Ex-works price of the equipment/materials (including tools and tackles etc.)
ii. Charges for transportation and insurance for delivery of the equipment/materials up to their final destinations.
iii. Lump-sum charges towards unloading, storage, insurance, erection, testing & commissioning, exclusive of taxes and duties as per GST.
iv. Price break-up for spares, if applicable, in line with clause 17.0 of this section.
v. Taxes and duties and any other levies legally payable on the transactions between the owner and the Bidder.
vi. Any other charges as per the requirement of conditions of contract/Technical specifications.

12.4 Bidder can effect reductions in the prices already filled up in Price Schedules by way of discounts. Bidder can offer the discount either on lump sum basis or percent basis, which can be made applicable either on the total price or one or more of the price schedule(s).

The Bidder may note that in case they chooses to offer multiple discounts, all discounts shall be applicable simultaneously on the base prices of respective items on which the bidder has offered the discount(s) i.e., all the discounts shall be considered together on the Quoted Prices of such items (as quoted by the bidder without discount).

12.5 Examination of the bid shall be in accordance to Clause 34 of Section INB.

13.0 ALTERNATE PROPOSALS

13.1 Based on their experience, capabilities, patented research, and development works etc., the bidder may, in addition to a base proposal, offer alternate 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 bidding documents and only such base proposal shall be considered for the purposes of evaluation of the 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.

14.0 PRICE BASIS AND PAYMENTS

14.1 The bidders shall quote in their proposals lump-sum price for the entire scope of works covered under section Project, Volume-II as required in the Bid Forms on a firm price basis unless otherwise specified in the Conditions of Contract. Bidders quoting a system of pricing other than that specified run the risk of rejection.

14.2 Bidder shall indicate bid prices in Indian Rupees only.
15.0 **PRICE ADJUSTMENT**

Unless otherwise specified in the accompanying Conditions of Contract, the Bidder shall quote fixed price quotation for the ex-works price of the equipment/materials and erection price components. Price shall remain firm for all equipment/materials and erection works and no price adjustment, whatsoever, shall be applicable for the price component of the items.

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 The Owner’s requirements of completion schedule for the works are mentioned in the accompanying conditions of contract.

16.3 The completion schedule as stated in the Conditions of Contract shall be one of the major factors in consideration of the bids.

16.4 The Owner 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 the Owner as per the requirement of Clause 18.0, Section CC, Vol-I.

17.0 **SPARE PARTS**

17.1 In case where it is mandatory for the bidders to quote for certain identified spare parts, the same are included in the accompanying Technical Specifications. In such cases the item wise price breakdown of such spares on an Ex-works basis shall be indicated in the bid. The Bidder shall further indicate item wise price break-up on FOR site basis. In respect of Customs duties and Taxes, the provisions of Clause 14.0 above shall be applicable. The above prices shall not be included in the lump-sum price but indicated separately in the Attachments and shall not be subject to escalation. The prices quoted for these spares will be taken into account for evaluation. The owner, however, reserves the right to vary the quantity of any of the spare and/or to delete any items of spares altogether or add new items of spares during award/detailed engineering stage limited to a period of six (6) months from date of contract unless such period is specified otherwise in conditions of contract at the unit rate agreed to in the contract or to be agreed mutually in case unit rates are not identified in the Bid/Contract.

17.2 In addition the Bidder shall provide in the form of Attachment given in Bid Forms, the complete list of recommended spare parts for three (3) years operation of the equipment covered under the Proposal. In the list of recommended spare parts, the bidder shall identify the unit-wise population of each of the items recommended and anticipated normal life of the spare. Such list will also indicate the prices on FOR destination site basis for each item. No other basis of prices will be quoted. The prices of these spare parts shall be on firm price basis and shall remain valid till 120 days after the date on which the validity of the main bid expires. The prices of the spare parts thus quoted shall not be taken into consideration for the purpose of evaluation. Other relevant terms and conditions of these documents shall also be applicable to such spare parts.
17.3 Spare parts list will be used by the owner to decide about the spares to be procured against his spares requirement for equipment quoted. The quantities of the spares to be procured shall be decided by the owner and the Bidder shall furnish all those spares ordered.

17.4 In case where no mandatory spares are indicated, the Bidder shall comply with the requirement indicated in Clause 17.2 through 17.3 above.

18.0 CONTRACT QUALITY ASSURANCE

18.1 The Bidder shall include in his Proposal the Quality Assurance Programme containing the overall quality management and procedures, which he proposes to follow in the performance of the works during various phases as detailed in relevant clause of the General Technical Conditions.

18.2 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.

19.0 INSURANCE

19.1 The Bidder’s insurance liabilities pertaining to the scope of works are detailed out in Clauses titled ‘Insurance’ in Conditions of Contract (CC) of this Volume- I. Bidder’s attention is specifically invited to these clauses. Bid price shall include all the cost in pursuance of fulfilling all the insurance liabilities under the Contract.

20.0 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 package. The Bidder shall indicate all the above items in the Proposal sheets in the form of an Attachment given there in 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 Conditions of Contract and /or Technical Specifications, Volume-II.

21.0 ERECTION TOOLS & TACKLES

The Bidder, under a separate Attachment, 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 Attachment, it shall be deemed to have been included in the Bidder’s proposed scope of supply.

22.0 BRAND NAMES

22.1 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 the owner to determine its acceptability. The Owner shall be
the sole judge on the acceptability or otherwise of such alternative material/equipment.

22.2 The Bidder shall note that standards for workmanship, material and equipment and reference
to brand names or catalogue numbers designated by the Owner 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
the Owner’s satisfaction that the substitutions are substantially equivalent or superior to those
designed in the Technical Specifications.

23.0 BID SECURITY

23.1 The Bidder shall furnish, as part of its bid, Bid Security for an amount as specified in the web
notification.

23.2 The Bid Security is required to protect the Owner against the risk of Bidders, conduct, which
would warrant the guarantee forfeiture, pursuant to Clause 23.7. The Bid Security shall be
made payable to the Owner without any condition whatsoever.

23.3 The Bid Security shall be denominated in Indian Rupees only and shall be in one of the
following forms:

[a]. Crossed Bank draft in favour of Delhi Transco Limited New Delhi, payable at New
    Delhi, from a Scheduled Commercial Bank.

[b]. A cheque certified by the Banker as good for payment drawn in favour of Delhi
    Transco Limited, New Delhi payable at New Delhi on a Scheduled Commercial Bank.

[c]. An irrevocable Bank Guarantee issued by a Scheduled Commercial Bank in favour of
    Delhi Transco Limited, New Delhi & BG (Bank Guarantee) should be valid for
    minimum 225 days from date of opening of tender. Performa for the Bank Guarantee
    is enclosed as Annexure-2, Section Forms & Procedure to this Volume-I.

The format of the bank guarantee shall be in accordance with the form of bid
security included in the bidding documents. Bid security shall remain valid for a
period of forty-five (45) days beyond the original bid validity period, and beyond
any extension subsequently requested under INB Sub-Clause 24.2.

The detail of DTL’s Bank account is as under:

<table>
<thead>
<tr>
<th>Name</th>
<th>Delhi Transco Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Bank with Address</td>
<td>SBI Chandni Chowk Delhi.</td>
</tr>
<tr>
<td>Current Account No.</td>
<td>10820056547</td>
</tr>
<tr>
<td>Codes</td>
<td>RTGS/IFSC No : SBIN0000631</td>
</tr>
<tr>
<td></td>
<td>MICR No : 110002018</td>
</tr>
</tbody>
</table>

23.4 Any bid not secured in accordance with paras 23.1 and 23.3 above will be rejected by the
Owner as non-responsive.
23.5 Unsuccessful Bidder’s Bid Security will be discharged /returned as promptly as possible after a decision with regard to finalization of the tender or after the expiry of the period of bid validity prescribed by the Owner.

23.6 The successful Bidder’s Bid Security will be discharged upon the Bidders, executing the Contract and furnishing the Performance Guarantee pursuant to Clause 43.0 of INB.

23.7 The Bid Security may be forfeited:

a) If a Bidder withdraws/modifies his bid during the period of bid validity specified by the Bidder on the Bid Form or extension thereof; or

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

c) If a Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to Clause 34.2, Section-INB; or

d) If, as per the Qualifying Requirements the Bidder has to submit a Deed of Joint Undertaking and bidder fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant (s) or registered with the Indian Embassy/ High Commission in that country, before opening of price bid; “This clause is not applicable for this tender”. or

e) In case of a successful Bidder, if the Bidder fails to sign the Contract; or

f) In case of a successful Bidder, if the Bidder fails to furnish the Performance Guarantee.”

23.8 The Scanned copy of Bid Security is to be submitted with online bid, however, the Bid Security shall be submitted in separate sealed envelope in one original and two copies in the office of DGM (T) CM, 5th Floor, Shakti Sadan, Kotla Road, New Delhi at least one hour before the time of bid opening. Any bid not accompanied by the required bid security in accordance with provisions of this clause will be rejected by the Owner and shall not be opened.

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

24.0 PERIOD OF VALIDITY OF BIDS

24.1 Bids shall remain valid for 180 days after the date of bid opening prescribed by the Owner unless otherwise specified in the accompanying Conditions of Contract. A bid valid for a shorter period will be rejected by the Owner as non-responsive.

24.2 In exceptional circumstances the Owner may solicit the Bidder’s consent to an extension of the period of validity. The request and the response thereto shall be made in writing (including cable or telex). The bid security provided under Clause 23.0 shall also be extended by the same period as the extension in the validity of the Bid. A Bidder may refuse the request without forfeiting his bid security. A Bidder granting the request will not be required or permitted to modify its bid.
D. SUBMISSION OF BIDS

25.0 FORMAT OF BID

25.1 The online offer complete in all respects will be submitted at e-procurement portal of Delhi Govt. website i.e. http://govtprocurement.delhi.gov.in. In addition to submission of scanned copies of mandatory documents through e-procurement portal, the bidder shall also submit (03) three copies of the bid in Book Bound form, clearly marking each “Original Bid” and “Copy of bid” including, the signed hard copies of all relevant pre-qualification documents being submitted in support of Bid (all Forms, Annexures etc. Experience certificate and supporting documents copies, type test reports, Guaranteed Technical Particulars, any other documents required as per the bidding document, etc.) and un priced schedule at least one hour before the time of bid opening in the office of DGM (T) CM, Delhi Transco Limited, Room No.-504, 5th Floor, Shakti Sadan, Kotla Road, New Delhi-110002. In the event of any discrepancy between original and copy of the hard bid, the original shall govern. Also in the event of any discrepancy between online bidding documents and the hard copy of the bid, the online bid shall govern. The Price Bid (Part-II) shall not be submitted in hard copy and shall only be uploaded on e-portal of Delhi Govt. website.

25.2 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.

25.3 The Bidders must submit the qualifying data in (03) three copies, as required in this Instruction to Bidders in a separate envelop sealed and enclosed in the envelope submitting Proposals, super scribed as under:

QUALIFYING DATA FOR SUPPLY AND ERECTION OF:
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

25.4 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 initialed by the persons or persons signing the bid.

25.5 Documents to be uploaded on e-procurement portal of Delhi Government while bidding:

The following scanned copies of documents are required to be uploaded:

a) Tender Fee and Bid Security
b) GST Registration No.
c) PAN and TIN No.
d) EPF Registration No.
e) Registration Certificate of the Company issued from the Competent Authority.
f) Details of technical experience along with performance certificates as per NIT.
g) Financial details as per NIT
h) Bid form, attachments and annexure’s as per NIT
i) Price bid (Only Online)
j) Other documents as per NIT
26.0 SIGNATURE OF BIDS

26.1 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 signature.

26.2 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).

26.3 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.

26.4 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.

26.5 Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the bid.

26.6 The Bidder’s name stated on the Proposal shall be exact legal name of the firm.

26.7 Bids not conforming to the above requirements of signing may be disqualified.

27.0 SEALING AND MARKING OF BIDS

27.1 The Bidders shall seal the original and each copy of the bid in an inner and an outer envelope, duly marking the envelopes as “Original” and “Copy”.

27.2 The inner and outer envelopes shall be:

a). Addressed to the Owner at the following address:
   Office of DGM (T) CM
   Delhi Transco Limited, Room No.-504, Fifth Floor,
   Shakti Sadan, Kotla Road
   New Delhi – 110002
   Phone Number: 011-23230026, Fax No. 011-23234640
   Email: sc.jangir@dtl.gov.in

b). bear the name of package, the specification number, Details of Bid Guarantee, Validity of Bid, Name of the Bidder with address and the words “DO NOT OPEN BEFORE date and
time of opening as mentioned in web notification”, to be completed with the time and date specified in the Invitation of Bid, pursuant to INB Sub-Clause 27.2. Other Annexure’s/Performa’s/Attachments shall be enclosed in envelope on which above contents shall be super scribed. The Price Bid (Part-II) shall not be submitted in hard copy, and shall be submitted online only however un priced schedules shall be submitted along with techno commercial bid Part I.

27.3 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”.

27.4 If the outer envelope is not sealed and marked as required by para 27.2 above, the Owner will assume no responsibility for the bid’s misplacement or premature opening or its secrecy, but this disclosure will not constitute grounds for bid rejection.
27.5 The Bid Security and tender fee must be submitted in a separate sealed envelope on which the contents shall be super scribed.

27.6 The Bidder shall submit the sealed bids in Two Part System i.e. PART-I (TECHNO-COMMERCIAL BID- ONLINE AND IN HARD COPY) and PART-II (PRICE BID- ONLINE ONLY). The Integrity Pact shall be submitted in two (2) originals in separate sealed envelope alongwith bid having marking as “Integrity Pact”. The separate envelopes containing original & copies of PART-I (TECHNO-COMMERCIAL BID)”, and BID SECURITY and Integrity Pact shall then be sealed in an outer envelope.

PART-I (TECHNO-COMMERCIAL BID) - All supporting documents, Attachments, Annexures, Performa, Un-priced Schedules, Bid Form (un-priced) and Bid document except price bid.

PART-II (PRICE BID) - Price Schedules & Bid Form only. (ONLINE ONLY)

28.0 DEADLINE FOR SUBMISSION OF BIDS

28.1 The Bidders are required to submit the bid through e-procurement portal of Delhi Govt. website i.e. http://govtprocurement.delhi.gov.in not later than the time & date mentioned in the Invitation of Bid. In addition to submission of scanned copies of mandatory documents through e-procurement portal, the bidder shall also submit (03) three copies of the bid in Book Binded form, clearly marking each “Original Bid” and “Copy of bid” including. the signed hard copies of all relevant pre-qualification documents being submitted in support of Bid (all Forms, Annexures etc. Experience certificate, supporting documents copies, type test reports, Guaranteed Technical Particulars and any other documents required as per the bidding document, etc.) atleast one hour before the time of bid opening in the office of DGM (T) CM, Room No.-504, Fifth Floor, Shakti Sadan, Kotla Road, New Delhi – 110002 . In the event of any discrepancy between original and copy of the hard bid, the original shall govern. Also in the event of any discrepancy between online bidding documents and the hard copy of the bid, the online bid shall govern. The Price Bid (Part-II) shall not be submitted in hard copy and shall only be uploaded on e-portal of Delhi Govt. website. Bidders have the option of sending the hard copy of 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 the Owner to collect the Proposals from airlines, cargo agents etc. shall be entertained by the Owner.

28.2 Hard Copy of the bids must be received by the Owner at the address specified under para 27.2, not later than the time & date mentioned in the Invitation of Bid. In the event of the specified date for submission of Bids, being declared a holiday for the Owner, the Bid will be received upto the appointed time on the next working day.

28.3 The Owner may, at its discretion, extend this deadline for the submission of bids by amending the Bidding Documents, in which case all rights and obligations of the Owner and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

29.0 LATE BIDS

29.1 Any bid received by the Owner after the time & date fixed or extended for submission of bids prescribed by the Owner, will be rejected and/or returned unopened to the Bidder.
30.0 MODIFICATION AND WITHDRAWAL OF BIDS

30.1 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 the Owner prior to the deadline prescribed for submission of bids.

30.2 The Bidder’s modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions of Clause 27.0 clearly identified as such, in two inner envelopes duly marked "Bid Modifications-Original" and "Bid Modifications-Copies." The inner envelopes shall be sealed in an outer envelope, which shall be duly marked "Bid Modifications." The Bidder shall submit one (1) no. original and two (2) no. copies of the same.

Other provisions concerning the marking and dispatch of bid modifications shall be in accordance with INB Sub-Clauses 27.2, 27.3 and 27.4.

30.3 No bid may be modified subsequent to the deadline for submission of bids.

30.4 A Bidder wishing to withdraw its bid shall notify the Owner in writing prior to deadline prescribed for bid submission. Notice of withdrawal shall

   a) be addressed to the Owner named in Clause. No. 27.2(a) of INB
   b) bear the name of the package, tender/ specification number, and the words “Bid Withdrawal Notice”

Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid.

30.5 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 Guarantee.

31.0 INFORMATION REQUIRED WITH THE PROPOSAL

31.1 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.

31.2 The above information shall be provided by the Bidder in the form of separate sheets, drawings, catalogues, etc. in (03) three copies.

31.3 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 by the Owner. Any major departure from these drawings and descriptive material submitted will not be permitted during the execution of the Contract without specific written permission of the Owner.

31.4 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.
31.5 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.

31.6 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.

31.7 In case the ‘Proposal’ information contradicts specification requirements, the specification requirements will govern, unless otherwise brought out clearly in the Technical Commercial Deviations Attachment.

E. BID OPENING AND EVALUATION

32.0 OPENING OF BIDS BY OWNER

32.1 The Owner will open the Part-I (Techno Commercial Bid) bids in the presence of Bidders’ representatives (up to 2 persons) who choose to attend at the date and time for opening of bids 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. The Bidders’ representatives who are present shall sign in a register as well as performa evidencing their attendance. In the event of the specified date for submission of Bids, being declared a holiday for the Owner, the Bid will be received up to the appointed time on the next working day. First the Tender fee & Bid Security will be checked and in case Tender fee & Bid Security is not found of required amount or not in acceptable mode, the offer of that particular bidder shall be considered invalid. On the date of opening as notified, Bidders whose Tender fee & Bid Security will be found in order, only their Techno Commercial offer will be opened on the date of opening.

32.2 Envelopes marked “WITHDRAWAL” shall be opened first and the name of the Bidder shall be read out. Bids for which an acceptable notice of withdrawal has been submitted pursuant to INB clause 30.0 shall not be opened.

32.3 The Bidders’ names, bid prices, modifications, bid withdrawals and the presence or absence of the requisite Bid security, Integrity pact and such other details as the Owner, at its discretion, may consider appropriate will be announced at the opening. Subsequently, all envelopes marked “MODIFICATION” shall be opened and the submissions therein read out in appropriate detail. No bid shall be rejected at bid opening except for late bids pursuant to INB Clause 29.0.

Any bid not accompanied by an acceptable Tender fee & Bid Security shall be rejected by the Owner as being non responsive, pursuant to INB clause 34.4.

32.4 No electronic recording devices will be permitted during bid opening.

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

33.0 CLARIFICATION OF BIDS

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

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

34.2 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, or between sub-totals and total price, the unit or sub-total 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 Security forfeited in accordance with Cl.No.23.7 of INB.

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.

34.3 Prior to the detailed evaluation of PART-I (TECHNO-COMMERCIAL BID), the Owner will determine whether each bid is acceptable quality, is generally complete and is substantially responsive 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, objections, conditions or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with the bidding documents, the Owner's rights or the successful Bidder's obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids. The PART-II (PRICE BID) of only those bidders whose TECHNO-COMMERCIAL BID are of acceptable quality shall be opened ONLINE ONLY, thereafter. However technically acceptable party shall be informed for the opening of the Price Bid (Part-II).

34.4 A bid determined as not substantially responsive will be rejected by the Owner and may not subsequently be made responsive by the Bidder by correction of the non-conformity. The Owner’s determination of a bid’s responsiveness is to be based on the contents & compliance of the complete provisions of TECHNO-COMMERCIAL bid itself without recourse to extrinsic evidence.

34.5 The Owner 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.

35A Detailed Technical & Commercial Evaluation (Part-I)

35A.1 The Owner will carry out a detailed evaluation of the Techno-Commercial (Part-I) offer to determine whether the Technical/Commercial aspects are in accordance with the requirements set forth in the bidding documents. In order to reach such a determination, the Owner will examine and compare the technical/commercial aspects of the bids on the basis of the information supplied by the bidders, taking into account the following factors:

(a) overall completeness and compliance with the Techno-Commercial Specifications
and Drawings; deviations from the Technical Specifications as identified in Attachment-7 to the bid; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non-responsiveness.

(b) achievement of specified performance criteria by the facilities & Qualifying Requirements as provided in Annexure-A of CC. The evaluation will also take into account the Bidder's financial, technical and production capabilities.

(c) type, quantity and long term availability of mandatory and recommended spare parts and maintenance services.

(d) any other relevant factors, if any, listed in the Bid, or that the Owner deems necessary or prudent to take into consideration.

(e) The bidder has to quote the complete scope of work for the subject package covered under the specifications as stated in the bid document. Bids covering partial scope of work will be treated incomplete and shall be rejected.

(f) Conditional discount(s)/ rebate(s), if any, offered by the bidder shall not be taken into consideration for evaluation. It shall however, be considered in case of award. Discount(s)/ rebate(s) offered by the bidder shall be indicated either on lumpsum basis or percent basis. Bidder shall also indicate in his bid, the price component on which the percentage discount is to be applied. In case the price component(s) on which the percentage discount is applicable is not indicated in the bid, then the discount will be adjusted in the total bid price [i.e. proportionately on each price component], in the event of award. However, if lumpsum discount is offered, the same shall be adjusted in full from the ex-works price component (by proportionately reducing ex-works price of individual items), in case of award.

(g) The cost of withdrawal of deviations shall also be considered for the purpose of evaluation of Bid.

35A.2 When alternative technical proposal have been permitted and offered in Section-INB to the bid, the Owner will make similar evaluation of the alternatives, which will be treated in the technical and commercial evaluations as if they were base bids. Where alternatives are not permitted, but have in any event been offered, they shall be ignored.

35A.3 Bid stipulating commissioning dates beyond that specified under the Attachment 10 of Clause 10.0 titled “Work Completion Schedule Attachment” in this Volume will run the risk of rejection.

35A.4 If the vendor has quoted higher than the scheduled delivery period, the bids will be treated as non-responsive. No credit will be given for the earlier delivery/completion.

35A.5 Performance & Productivity Equipment

Bidder shall state the guaranteed performance or efficiency in response to the Technical specifications. Goods offered shall have minimum performance specified in Technical specification to be considered responsive. Bids offering Goods with a performance less than the specified may be rejected.
35B Evaluation of Price Bids (Part-II)

35B.1 The Owner will carry out a detailed evaluation of the Price Bids Part (Part-II) of the bidders found techno-commercially successful. The comparison will be as follows:

35B.1.1 Bidders have to quote for the complete scope of work for package as stated in Technical Specifications, Volume-II of the Bidding Documents. Bids for individual items or incomplete services shall be treated as incomplete and are liable to be rejected.

35B.1.2 Conditional discount/rebate, if any, offered by the Bidder shall not be taken into consideration for evaluation. It shall, however, be considered in case of award. Discount(s)/ rebate(s) offered by the bidder shall be indicated either on lumpsum basis or percent basis. Bidder shall also indicate in his bid, the price component on which the percentage discount is to be applied. In case the price component(s) on which the percentage discount is applicable is not indicated in the bid, then the discount will be adjusted in the total bid price [i.e. proportionately on each price component], in the event of award. However, if lumpsum discount is offered, the same shall be adjusted in full from the ex-works price component (by proportionately reducing ex-works price of individual items), in case of award.

35B.1.3 Deleted

35B.1.4 Bids shall be evaluated on the basis of lump sum price for the entire scope of work under the package. The lump sum price shall include:

(i) F.O.R. destination price of equipment/materials, including special tools & tackles and spares (if any) under the package.

(ii) Charges for erection, which shall include unloading, handling, storage, insurance, erection, testing & commissioning of the complete equipment/materials under the package and all associated civil works.

35B.1.5 DTL's evaluation of a bid, in addition to the lump sum price as per Clause 35B.1.4, will take into account (i) the applicable taxes, duties & levies payable/reimbursable by the Employer as per provisions of Clause 14.0 of CC, Volume I, (ii) the "Cost Compensation for Deviations/Cost of withdrawal of Deviations" which will be added to bid price as indicated under Clause 36.0, Section-INB, Conditions of Contract, Volume-I of the Bidding Documents, using pricing information available to the Owner. The comparison of bids shall be in the manner indicated in Clause 37.0, Section INB, Conditions of Contract, Volume-I of the Bidding Documents and in the Technical Specifications, Volume-II of the Bidding Documents.

35B.1.6 The Bidder is required to assess the quantities, based on the scope of work as per the Technical Specifications, Volume-II of the Bidding Documents and design of the Bidder, for certain items in the Price Schedule and quotes their prices accordingly. In case, in the opinion of the Bidder, based on the design, some additional items are required, they shall indicate the same and include these
prices in the lump sum Bid Price of the package. The prices for these additional items shall be considered for evaluation purpose.

35B.1.7 The prices of all such item(s) against which Bidder has not quoted rates/ amount (viz., items left blank or against which ‘-‘ is indicated) in the schedules will be deemed to have been included in other item(s).

35B.1.8 Deleted

35B.1.9 Deleted

35B.1.10 Examination of the bid shall be in accordance to Clause 35 of Section INB.

The Owner's comparison will also include the costs resulting from application of the evaluation procedures described in INB Sub-Clause 35.B.3. Overall landed bid price inclusive of all taxes and duties (as quoted by the bidder) shall be treated as final bid price for evaluation and comparison purposes. A clarification will be sought from the vendor in situation where the rates of taxes quoted by the bidder are higher than the prevailing rate of taxes at the time of bid opening. If the tax/rates taken into consideration by the bidder is higher than the prevailing rates/taxes, the value taken for comparison will be as per prevailing rates/taxes on the date of opening of bids, after obtaining clarification from the bidder in this regard.

35B.2 The Owner's evaluation of a bid will take into account, in addition to the bid prices indicated in Price Schedules, the following costs and factors that will be added to each Bidder's bid price in the evaluation using pricing information available to the Owner, in the manner and to the extent indicated in INB Sub-Clause 35.B.3 and in the Technical Specifications:

(a) the cost of all quantifiable deviations and omissions from the contractual and commercial conditions and the Technical Specifications as identified in Attachment-5 to 7 to the bid.

(b) compliance with the time Attachment called for in Attachment-10 of Bid price Attachment and evidenced as needed in a milestone Attachment provided in the bid.

(c) Performance and Productivity of the equipments offered

Bidder shall state the guaranteed performance or efficiency in response to Technical Specifications. Equipment offered shall have minimum performance specified in Technical Specifications to be considered responsive. Bids offering Equipments with a performance less that of specified may be rejected.

35B.3 Pursuant to INB Sub-Clause 35.B.2, the following evaluation methods will be followed:

(a) Contractual and commercial deviations

The evaluation shall be based on the evaluated cost of fulfilling the contract in compliance with all commercial, contractual and technical obligations under this bidding document. In arriving at the evaluated cost, the price of withdrawal of deviations shown in relevant Attachment of the bid, price and other Attachments, will be used. If the deviation to any of the provisions is not priced, the bid will be rejected.

At the time of award of contract, if so desired by the Owner, the bidder will withdraw the deviations listed in relevant deviation Attachments of bid in their bid at the cost of withdrawal stated by him in the bid. In case the bidder does not withdraw the deviations proposed by him in the bid, his bid will be rejected and his Bid Security will be forfeited.
(b) Time Attachment (program of performance)

The plant and equipment covered by this bidding are required to be shipped and installed, and the facilities shall have the pre-commissioning completed within the period named in the Bid after the effective date specified in the Contract Agreement. Bidders are required to base their prices on the time Attachment given in Attachment -10 of Bid Form to the form of Contract Agreement (Time Attachment) or, where no time Attachment is given, on the completion date(s) given in the Bid. No credit will be given for earlier completion. Bid offering completion beyond the named period is liable to be rejected.

(c) If the vendor has quoted higher than the scheduled delivery period, the bids will be treated as non-responsive.

Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an "Evaluated Bid Price." Bid prices quoted by Bidders shall remain unaltered.

36.0 DEFINITIONS AND MEANINGS

36.1 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 completed 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) ‘Cost Compensation for Deviations’ shall mean the Rupee value of deviations, which shall be provided by the Bidder with proper justification in his Bid.


36.2 Calculation of Differential Price & Cost Compensation for Deviations, if applicable:

36.2.1 The Differential Price (if applicable) to be added to the Bid Price of each during evaluation and comparison shall be derived as under:

\[
\text{Differential Price (DP)} = n_1 F_1 + n_2 F_2 + \ldots + n_n F_n
\]

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 specification; \( n_1, n_2, \ldots, n_n \) 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 Conditions of Contract.

37.0 COMPARISON OF BIDS

37.1 Lump-sum price includes all taxes and levies covering both supply of material as well as erection, installation and commissioning. However, while submitting the invoices/bills/running bills, for making payments, bifurcation between taxable amount and applicable taxes should be enumerated on each and every invoices/bills/running bills.
37.2 For comparison purposes all the evaluated bid prices shall be in Indian Rupees as under:-

\[
W = M + DP + D
\]

Where,

- \( W \) = Total Comparison Price
- \( M \) = Bid price in Indian Rupees (Ex-works value of equipment + Components of erection cost + mandatory spares, taxes and duties and other Components, if any).
- \( DP \) = Differential price (if applicable) in Indian Rupees calculated according to para 36.2.1 above.
- \( D \) = Cost compensation for deviations.

37.3 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.

38.0 CONTACTING THE OWNER

Bid shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award/rejection is made by the Owner 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, the Owner and/or his employees/representatives on matters related to the bids under consideration. The owner, 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 CRITERIA

39.0 AWARD CRITERIA

39.1 The Owner 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. The owner shall be the sole judge in this regard.

39.2 The Employer may request the Bidder to withdraw any of the deviations listed in Attachment 5 to 7 of the winning bid, at the price shown for the deviation in Attachment 5 to 7 to the bid. Bidder would be required to comply with all other requirements of the Bidding Documents except for those deviations which are accepted by the Employer.

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

39.4 The mode of contracting with the successful bidder will be as briefly indicated below:

In the case of successful Bidder, the award shall be made as follows:

(i) First Contract: Supply of equipment and materials on the ex-works basis.
(ii) Second Contract: Transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials in respect of all the equipments supplied under the "First Contract" and any other services specified in the Contract Documents.

Both contracts will contain a cross fall breach clause specifying that breach of one will constitute breach of the other.
40.0 OWNER’S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

40.1 The Owner reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Owner’s action. DELHI TRANSCO LIMITED reserves the right to waive minor deviations if they do not materially affect the capability of the Bidder to perform the contract.

41.0 NOTIFICATION OF AWARD

41.1 Prior to the expiration of the period of bid validity and extended validity period, if any, the Owner will notify the successful Bidder in writing by registered letter or by cable or telex or fax or e-mail, that its bid has been accepted which shall be confirmed in writing by bidder. However if confirmation is not received from the bidder the notification shall be deemed to have been accepted by the bidder after expiry of the period mentioned in the notification.

41.2 The notification of award will constitute the formation of the Contract.

41.3 Upon the successful Bidder’s furnishing of Contract performance Guarantee (CPG) pursuant to Clause 43.0 the Owner will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to Clause 23.0.

42.0 SIGNING OF CONTRACT

42.1 At the same time as the Owner notifies the successful Bidder that its bid has been accepted, the Owner will send the Bidder the detailed Letter of Award, incorporating all agreements between the parties.

42.2 Within seven (07) days of receipt of the detailed Letter of Award, the successful bidder shall sign and date the same and return it to the Owner, failing which all the terms & conditions of the Letter of Award shall be binding upon the successful bidder and it shall be treated as a binding Contract between Delhi Transco Limited and the successful bidder.

42.3 The Bidder will prepare the Contract Agreement as per the Performa enclosed at 5, Section- Forms & Procedure to this Volume-I and the same will be signed within 30 (thirty) days from the date of Notification of Award.

43.0 CONTRACT PERFORMANCE GUARANTEE

43.1 Within twenty-eight (28) days after receipt of the notification of award, the successful Bidder, to whom the work is awarded, shall be required to furnish a Performance Guarantee from (a) a Public Sector Bank or (b) a scheduled Indian Bank having paid up capital (net of any accumulated losses) of Rs. 100 crores or above (the latest annual report of the Bank should support compliance of capital adequacy ratio requirement) or (c) any foreign Bank or subsidiary of a foreign Bank having its branch in India with overall international corporate rating or rating of long term debt not less than A- (A minus) or equivalent by reputed rating agency, in the form attached as Annexure-II, Section- Forms & Procedure to this Volume-I in favour of the Owner. The guarantee amount shall be equal to ten percent (10%) 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. The guarantee shall be valid up to 90 days after the end of Warranty Period.
43.2 The Performance Guarantee shall cover additionally the following guarantees to the Owner:

a) The successful Bidder guarantees the successful and satisfactory operation of the equipment furnished and erected under the Contract, as per the 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 the Owner fully remedy free of expenses to the Owner such defects as developed under the normal use of the said equipment within the period of guarantee specified in the relevant clause of the Terms and Conditions in this Volume I/Conditions of Contract.

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

43.4 The Performance Guarantee will be returned to the Contractor without any interest at the end of guarantee period, unless otherwise specified in the Conditions of Contract.

44.0 Corrupt or Fraudulent Practices

44.1 DTL requires that Bidders/Suppliers/Contractors, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the DTL:

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

(i) "corrupt practice" means the 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 Employer/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 Borrower of the benefits of free and open competition;

(b) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

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

44.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 42.2 of the Conditions of Contract.
SECTION – CC

CONDITIONS OF CONTRACT

DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)

VOLUME – I
CONDITIONS OF CONTRACT
SECTION - III

Condition of Contract (CC)

A. Contract and Interpretation:

1.0 Definitions:

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

"Contract" means the Contract Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term "the Contract" shall in all such documents be construed accordingly.


"CC" means the Conditions of Contract hereof.

"Day" means calendar day of the Gregorian Calendar.

"Month" means calendar month of the Gregorian Calendar.

"Employer/Owner" means the person named as below and includes the legal successors or permitted assigns of the Employer/Owner.

Delhi Transco Ltd.
Shakti Sadan
New Delhi-110002
Fax No. – 011-23234640
Tel. No. -011-23230026

"Project Manager" means the person appointed by the Employer in the manner provided in CC Sub-Clause 17.1 (Project Manager) hereof and named as such in the CC to perform the duties delegated by the Employer.

The Project Manager is: [Name, address, telephone, cable, email-id and facsimile numbers]

"Contractor" means the person(s) whose bid to perform the Contract has been accepted by the Employer and is named as such in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

The Contractor is: [Name, address, telephone, cable and facsimile numbers ]

"Contractor's Representative" means any person nominated by the Contractor and named as such in the CC and approved by the Employer in the manner provided in CC Sub-Clause 17.2 (Contractor's Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

The Contractor's Representative is: [Name, address, telephone, cable and facsimile numbers]

"Subcontractor," including vendors, means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant and Equipment, is subcontracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns.

"Arbitrator" means the person or persons appointed by agreement between the Employer and the Contractor to make a decision on or to settle any dispute or difference between the Employer and the Contractor referred to him or her by the parties pursuant to CC Sub-Clause 6.2 (Arbitrator) hereof.

"Contract Price" means the sum specified in Article 2.1 (Contract Price) of the Contract
Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

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

"Plant and Equipment" means permanent plant, equipment, machinery, apparatus, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under CC Sub-Clause 7.3 hereof), but does not include Contractor's Equipment.

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

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

"Site" means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.

“Effective Date” means the date from which the Time for Completion shall be determined as stated in Article 3 (Effective Date for Determining Time for Completion) of the form of Contract Agreement.

“Taking Over” means the Employer's written acceptance of the Facilities under the Contract, after successful Trial – Operation for the specified period in accordance with the Contract.

"Time of completion" means the time within which completion of the Facilities as whole (or of a part of the Facilities where a separate Time for completion of such part has been prescribed) and Taking Over by the employer is to be attained in accordance with the stipulations in the CC and the relevant provisions of the Contract.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Activities</th>
<th>Duration in months from the date of Notification of Award</th>
<th>Completion of Delivery at site</th>
<th>Completion of Erection testing &amp; Commissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>(l)</td>
<td>Transformer Pkg. :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Najafgarh S/S</td>
<td>9 months</td>
<td>12 months</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>1x160MVA, 220/66/11kV, 3-Ph, Transformers at Kanjhawala S/S</td>
<td>9 months</td>
<td>12 months</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Gopalpur S/S</td>
<td>11 months</td>
<td>14 months</td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Budella GIS S/S</td>
<td>13 months</td>
<td>16 months</td>
<td></td>
</tr>
<tr>
<td>e)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Sanjay Gandhi Transport Nagar GIS S/S</td>
<td>13 months</td>
<td>16 months</td>
<td></td>
</tr>
</tbody>
</table>

Note: The delivery schedule has been envised by employer to accommodate the facilities as per specific site requirement. However, for the purpose of LD, final commissioning date as per schedule specified in the CC for respective facility shall be the benchmark.
The successful Bidder shall be required to prepare detailed Network(s) and project implementation plans & programmes and finalize the same with the Employer as per requirement specified in Technical Specifications, which shall form a part of the Contract.

Note: No credit will be given for the earlier delivery/ completion and offers with delivery/completion beyond the completion period will be treated as unresponsive.

"Completion" means that the Facilities (or a specific part thereof where specific parts are specified in the CC) have been completed operationally and structurally and put in a tight and clean condition, and that all work in respect of Pre-commissioning of the Facilities or such specific part thereof has been completed and Commissioning has been attained as per Technical Specifications followed by successful Trial – Operation, as provided in CC Clause 24.0 (Completion of Facilities) & 25.0 (Commissioning and Operational Acceptance) hereof.

"Pre-commissioning" means the testing, checking and other requirements specified in the Technical Specifications that are to be carried out by the Contractor in preparation for Commissioning as provided in CC Clause 24 (Completion) hereof.

"Commissioning" means operations of the facilities or any part thereof to be carried out by the Contractor as provided in CC Sub-Clause 25.1 (commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

"Guarantee Test(s)" means the test(s) specified in the Technical Specifications to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Technical Specifications in accordance with the provisions of CC Sub-Clause 25.2 (Guarantee Test) hereof.

"Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of CC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with CC Clause 25 (Commissioning and Operational Acceptance) hereof.

"Defect Liability Period" means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in CC Clause 27 (Defect Liability) hereof.

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

3. Interpretation
3.1 Language

3.1.1 All Contract Documents, all correspondence and communications to be given, and all other documentation to be prepared and supplied under the Contract shall be written in English, and the Contract shall be construed and interpreted in accordance with that language.

3.1.2 If any of the Contract Documents, correspondence or communications are prepared in any language other than the governing language under CC Sub Clause 3.1.1 above, the English translation of such documents, correspondence or communications shall prevail in matters of interpretation.

3.2 Singular and Plural
The singular shall include the plural and the plural the singular, except where the context otherwise requires.
3.3 **Headings**
The headings in the CC are included for ease of reference, and shall neither constitute a part of the Contract nor affect its interpretation.

3.4 **Persons**
Words importing persons or parties shall include firms, corporations and government entities.

3.5 **Incoterms**
Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties there under shall be as prescribed by Incoterms.

Incoterms means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1er, 75008 Paris, France.

3.6 **Entire Agreement**
Subject to CC Sub-Clause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

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

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

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

3.9 **Joint Venture or Consortium**
If the Contractor is a joint venture or consortium of two or more firms, all such firms shall be jointly and severally bound to the employer for the fulfillment of the provisions of the Contract and shall designate one of such firms to act as a leader with authority to bind the joint venture or consortium. The composition or the constitution of the joint venture or consortium shall not be altered without the prior consent of the Employer.

3.10 **Non-Waiver**
3.10.1 Subject to CC Sub-Clause 3.10.2 below, no relaxation, forbearance, delay or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.10.2 Any waiver of a party's rights, powers or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

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

3.12 **Country of Origin**
"Origin" means the place where the materials, equipment and other supplies for the Facilities are mined, grown, produced or manufactured, and from which the services are provided.
4. **Notices**

4.1 Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing, and shall be sent by personal delivery, airmail post, special courier, cable, telegraph, telex, facsimile, email id or Electronic Data Interchange (EDI) to the address of the relevant party set out in the Special Conditions of Contract, with the following provisions.

Employer’s address for notice purposes: [Name, address and telephone, cable, email-id and facsimile numbers]

Contractor’s address for notice purposes: [Name, address and telephone, cable, email-id and facsimile numbers]

4.1.1 Any notice sent by cable, telegraph, telex, facsimile, email id or EDI shall be confirmed within two (2) days after despatch by notice sent by airmail post or special courier, except as otherwise specified in the Contract.

4.1.2 Any notice sent by airmail post or special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of despatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped and conveyed to the postal authorities or courier service for transmission by airmail or special courier.

4.1.3 Any notice delivered personally or sent by cable, telegraph, telex, facsimile, email id or EDI shall be deemed to have been delivered on date of its despatch.

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

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

5. **Governing Law**

5.1 The courts at Delhi shall have the exclusive jurisdiction on all matters. The contract shall be governed and interpreted in accordance with the laws of the employer’s country, i.e India.

6. **Settlement of Disputes**

6.1. **Adjudicator**

Not applicable.

6.2 **Arbitration**

6.2.1 If at any time any question, dispute or difference shall arise between the Employer and the Contractor in connection with or arising out of the Contract or the carrying out of the Works either party shall be entitled to refer the matter to be finally settled by arbitration in accordance with the following provisions:

6.2.2 The arbitration shall be conducted by three arbitrators. One each to be nominated by the Contractor and the Employer and the third to be appointed 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.

6.2.3 The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration & Conciliation Act, 1996 or any statutory modification thereof. The venue of arbitration shall be New Delhi, India.

6.2.4 The arbitration shall be conducted at New Delhi, India. The language of arbitration shall be English.

6.2.5 The Arbitrator(s) shall have full power to open up review and revise:
6.2.6 The award given by the Arbitrator(s) under the Sub-clauses 6.2.1 & 6.2.3 shall be a speaking award.

6.2.7 Works to Continue
Performance of the Contract shall continue during arbitration proceedings unless the Employer shall order suspension. If any such suspension is ordered the reasonable costs incurred by the Contractor and occasioned thereby shall be added to the Contract Price. No payments due or payable by the Employer shall be withheld on account of pending reference to arbitration.

6.2.8 Time Limit for Arbitration
Formal notice of arbitration must be given to the other party, and where required to the appropriate arbitration body no later than 90 days after the issue of the Final Certificate of Payment.

6.2.9 Law and Procedure

6.2.9.1 Applicable Law
The law, which is to apply to the Contract and under which the Contract is to be construed, shall be Indian law.

6.2.9.2 Procedural Law
The law governing the procedure and administration of any arbitration instituted pursuant to Clause 6.0 shall be Indian law.

B. Subject Matter of Contract

7. Scope of Facilities

7.1. Unless otherwise expressly limited in the Technical Specifications, the Contractor’s obligation cover the provision of all Plant and Equipment and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Pre-commissioning and delivery) of the Plant and Equipment and the installation, completion, commissioning and performance testing of the facilities in accordance with the plans, procedures, specifications drawings, codes and any other documents as specified in the Technical specifications. Such specifications include, but are not limited to, the provision of supervision and engineering services the supply of labour, materials, equipment, spare parts (as specified in CC sub-clause 7.3 below) and accessories, Contractor's Equipment; construction utilities and supplies, temporary materials, structures and facilities, transportation (including without limitation, unloading and hauling to, from and at the Site); and storage except for those supplies, works and services that will be provided or performed by the Employer, as set forth in Appendix-6 (Scope of Works and Supply by the Employer) to the Contract Agreement.

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

7.3 In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the CC. However, the identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedules, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price thereof and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.
The Contractor shall ensure the availability of spare parts for the supplied items for a minimum period of fifteen (15) years from operational acceptance by the Employer.

7.4 The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the plant and equipment. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order and opening the letter of credit.

7.5 In the event of termination of production of spare parts:

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

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

8. Time for Commencement and Completion

8.1 The Contractor shall commence work on the Facilities within the period specified in the CC and without prejudice to CC Sub-Clause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in Appendix 4 (Time Schedule) to the Contract Agreement.

The contractor shall commence work on the facilities from the Effective Date of Contract for determining Time for completion as specified in the contract.

8.2. The Contractor shall attain Completion of the Facilities (or of a part where a separate time for Completion of such part is specified in the Contract) within the time stated in the CC or within such extended time to which the Contractor shall be entitled under CC Clause 40 (Extension of Time for Completion) hereof.

9. Contractor's Responsibilities

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

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

9.3 The Contractor shall acquire in its name all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located that are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under CC Sub-Clause 10.3 hereof and that are necessary for the performance of the Contract.

9.4 The Contractor shall comply with all laws in force in the country where the Facilities are installed and where the Installation Services are carried out. The laws will include all national, provincial, municipal or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to CC Sub-Clause 10.1 hereof.

9.5 Any Plant, Material and Services that will be incorporated in or be required for the Facilities and
other supplies shall have their origin as specified under CC Sub-Clause 3.12 (Country of Origin).

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

10. **Employer’s Responsibilities**

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

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

10.3 The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the site is located which such authorities or undertakings require the Employer to obtain them in the Employer’s name, are necessary for the execution of the Contract (they include those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract), including those specified in Appendix 6 (Scope of works and supply by the Employer) to the Contract Agreement.

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

10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel, shall supply and make available all raw materials utilities, lubricants, chemicals, catalysts, other materials and facilities, and shall perform all works and services of whatsoever nature, to enable the Contractor to properly carry out Pre-commissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of Appendix 6 (Scope of works and supply by the Employer) to the Contract Agreement at or before the time specified in the program furnished by the Contractor under CC Sub-Clause 18.2 (Program of Performance) hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.

10.6 The Employer shall be responsible for the continued operation of the facilities after Operational Acceptance, in accordance with CC 25.3.

10.7 All costs and expenses involved in the performance of the obligations under this CC Clause 10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with CC Sub-Clause 25.2.

C. **Payment**

11. **Contract Price**

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

11.2 The Contract Price shall be on lump sum basis. The Contract price shall be adjusted on account of variation in quantity in accordance with clause 39 CC. Further the CIF/Ex-works price component and installation price component shall also be subject to price adjustment in line with the provisions of Appendix 2 to Form of Contract Agreement.

11.3 Subject to CC Sub-Clauses 9.2, 10.1 and 35 (Unforeseen Conditions) hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract.
Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

12. Terms of Payment

12.1 The Contract Price shall be paid as specified in Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement. The procedures to be followed in making application for and processing payments shall be those outlined in the same Appendix 1.

12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.

12.3 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated in the Contractor's bid.

12.4 All payments shall be made in currency or currencies specified in the corresponding Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, pursuant to CC 12.3.

13. Securities

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

13.2 Advance Payment Security

13.2.1 The Contractor shall, within twenty-eight (28) days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with Appendix 1 (Terms and Procedures of Payment) to the Contract Agreement, and in the same currency or currencies with a validity of up to the date of completion of Facilities in accordance with CC clause 24.0 and it shall be kept alive till the recovery of the full amount of the advance with interest portion.

13.2.2 The Security shall be in the form provided in the bidding documents or in another form acceptable to the Employer. The security shall be discharged after completion of the facilities or relevant party thereof.

Procedure for effective reduction in the Advance Payment Security:

Recovery of the advance amount shall be made from each running bill proportionately. It should be clearly understood that reduction in the value of security for advance shall not in any way dilute the Contractor's responsibility and liabilities under the Contract including in respect of the Facilities for which reduction in the value of security is allowed.

13.3 Performance Security

13.3.1 The Bidder shall submit performance guarantee of 10% of the contract value within twenty eight (28) days of the notifications of award, valid for 12 Months from operational acceptance. Then this performance guarantee shall be renewed periodically every year for next four years. Every renewal of performance guarantee shall be done by the contractor one month prior to the expiry date.

The bidder will submit an undertaking to the owner with a copy to the banker issuing the performance bank guarantee that the bidder will renew and submit the bank guarantee within thirty days before the expiry of bank guarantee failing which it shall be encashed and credited in favour of DTL automatically by the banker without waiting for any instructions from DTL.

13.3.2 The performance security shall be in the form of unconditional Bank Guarantee attached hereto in the Section - IV Sample Forms and Procedures.

13.3.3 Reduction in the security pro rata to the Contract Price of any part of the Facilities is not admissible since separate time for Completion of part of the facilities is not applicable. However,
if the Defects Liability Period has been extended on any part of the Facilities pursuant to CC sub-clause 27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The Security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor pursuant to CC Sub-Clause 27.10, is liable for an extended warranty obligation, the performance security shall be extended for the period and up to the amount specified in the CC clause 27.

13.3.4. In case of award of the contract to a Joint Venture, the performance security and the Bank Guarantee for advance payment shall be submitted in the name of the Joint Venture and not in the name of the Lead Partner or any Partner(s) of the Joint Venture alone.

13.4 Issuing Banks
The Advance Payment Security and Performance Security are to be provided by the Contractor in the form of ‘Bank Guarantee’ which should be issued either:

(a) by a reputed bank located in the country of Employer and acceptable to the Employer, or

(b) by a foreign bank confirmed by either its correspondence bank located in the country of Employer which should be reputed and acceptable to the Employer, or

(c) by a Public Sector Bank in the country of Employer.

All banks shall be nationalized and scheduled banks operating in India.

14. Taxes and Duties

14.1 Prices are to be quoted exclusive of GST and GST rate may also be indicated in the price bid and BOQ/un-priced schedule.

14.2 The Contractor shall be entirely responsible for payment of all taxes, duties, licence fees and other such levies legally payable/incurred until delivery of the contracted supplies to the Employer. If it is statutory requirement to make deductions towards such taxes and duties or any other applicable taxes and duties, the same shall be made by the owner and a certificate for the same shall be issued to the Contractor.

14.3 The Contractor shall be solely responsible for its Income Tax liabilities and for taxes that may be levied on the Contractor’s persons or on earnings of any of his employees and shall hold the owner indemnified and harmless against any claims that may be made against the Employer. The Employer does not take any responsibility whatsoever regarding taxes under Income Tax Act, for the Contractor or his personnel. If it is obligatory under the provisions of the Income Tax Act, deduction of Income Tax at source shall be made by the Employer.

14.4 In respect of transactions between the Employer and the Contractor, the Base Price is inclusive of all cost as well as duties and tax (custom duties & levies, Taxes and duties as per GST Rules) paid or payable on components, raw materials and any other items used/ incorporated or to be incorporated in the Plants & Equipments and other final goods & services to be supplied by the contractor under the proposed contract. No separate claim shall be paid by the Employer for taxes and duties included in respect of these items stated herein.

14.5 Taxes, duties and levies as per GST Rules for the goods & Services under ‘transactions’ between contractor & Employer for destination site/state shall not be included in the base price. These amounts will be payable (along with subsequent statutory variation if any) on the supplies made by the Contractor, subject to submission of the documentary evidence indicating the said taxes paid by the contractor and GST credit is transferred to the Employer. But the amount of said taxes shall be limited to the tax liability on the transaction between the employer and the Contractor only. However, Employer will not bear any upward variation in GST rate due to change/disputes in classification relating to HSN/SAC code as quoted by the bidder at a later stage. Employer shall, however, deduct such taxes at source as per the rules and issue Tax Deduction at Source (TDS) Certificate to the Contractor as per the said rules. The Input Tax Credit (ITC) available, if any, under GST as per the relevant Government laws wherever
The Contractor shall comply with all tax laws in force in India. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, interest, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such tax laws by the Contractor or its personnel, including the Subcontractors and their personnel.

For payment in respect of dispatches made directly from Contractor's works, Tax invoices raised by the Contractor shall be accepted as documentary evidence and for payment of GST. The amount of GST as stated in Tax invoice will be paid only after the GST credit is transferred to the Employer. However, the employer from time to time may also verify the payment / deposit of various taxes by the contractor, which the later has already claimed and charged in the previous invoices from the employer against the aforesaid transactions between employer and the contractor.

In Case the Taxes, Duties and Levies as per GST Rules on transaction between Employer and the Contractor is covered under the Reverse Charge provision full Tax has to be stated / mentioned in the quoted prices/ bid. However, where the Reverse Charge Mechanism Provisions are applicable, DTL shall not pay the applicable tax amount to the contractor and will deposit directly to the Government treasury. To facilitate the bidders, Employer has indicated HSN/SAC code and rate of GST against each item in the price schedule. It shall entirely be the responsibility of the bidder to check the HSN/SAC code and rate of GST given against each item. The bidder may either confirm the HSN and rate of GST or if the bidder opts to classify the item in question under a different HSN/ SAC code or opts to indicate a different rate of GST, bidder may indicate the same in the columns provided. The bidder shall solely be responsible for HSN/SAC classification and the rate of GST of each item. Employer’s liability for the reimbursement of GST shall be GST applicable at the rate as confirmed/ deemed confirmed in the bid and as accepted by the employer. The Input Tax Credit (ITC) available, if any, under the GST law as per the relevant Govt. policies wherever applicable shall be taken into account by the bidder while quoting bid price.

For the purpose of the Contract, it is agreed that the Contract Price specified in Article-2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes inclusive of duties, levies and charges prevailing at the date seven (07) days prior to the last date of bid submission. If any rates of Tax including service tax are increased or decreased or, a new Tax is introduced, or/an existing Tax is abolished in the course of the performance of the Contract, which was or will be assessed on the Contractor in connection with performance of the Contract, an equitable adjustment of the Contract price shall be made to take into account any such change by addition to the Contract price or deduction therefrom, as the case may be (changes in law & regulations) hereof. However, these adjustments would be applicable to all transactions between the employer and the Contractor for which the taxes and duties are reimbursable by the Employer as per the Contract. These adjustments shall not be applicable on procurement of raw materials, intermediary components etc by the Contractor.

In respect of raw materials, intermediary components etc forming part of base price of goods &
services supplied under the contract, neither the employer nor the Contractor shall be entitled to any claim arising due to increase or decrease in the rate of Tax, introduction of a new Tax or abolition of an existing Tax in the course of the performance of the Contract. However, Employer will not bear any upward variation in GST rate due to change/disputes in classification relating to HSN/SAC code as quoted by the bidder at a later stage.

D. Intellectual Property

15. Copyright

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

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

16. Confidential Information

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

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

16.3 The obligation of a party under CC Sub-Claus 16.1 and 16.2 above, however, shall not apply to that information which:

(a) now or hereafter enters the public domain through no fault of that party

(b) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto

(c) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality

16.4 The above provisions of this CC Clause 16 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.

16.5 The provisions of this CC Clause 16 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

17. Representatives

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

All notices, instructions, information and other communications given by the Contractor to the employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.

17.2 Contractor's Representative & Construction Manager

17.2.1 If the Contractor's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefore, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this CC Sub-Clause 17.2.1 shall apply thereto.

17.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the currency of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information and all other communications under the Contract.

All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.

The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in CC Sub-Clause 17.2.1.

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

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this CC Sub-Clause 17.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.

17.2.3.1 Notwithstanding any thing stated in CC sub-Clause 17.1 and 17.2.1 above, for the purpose of execution of Contract, the Employer and the Contractor shall finalize and agree to a Contract Co-ordination Procedure and all the communication under the Contract shall be in accordance with such Contract Coordination Procedure.

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

17.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under CC Sub-Clause 22.3. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.

17.2.6 If any representative or person employed by the Contractor is removed in accordance with CC Sub-Clause 17.2.5, the Contractor shall, where required, promptly appoint a replacement.
18. **Work Program**

18.1 **Contractor’s Organization**

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

18.2 **Program of Performance**

The form of the program of performance of the Contract shall be in the form of the Critical Path Method (CPM), the PERT network, or other internationally used programs.

Within twenty-eight (28) days after the date of Notification of Award, the Contractor shall prepare and submit to the Project Manager a detailed program of performance of the Contract, made in the form specified in the CC and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and pre-commission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve completion, commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in appendix-4 (Time Schedule) to the Contract Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion given in the CC and any extension granted in accordance with CC Clause 40, and shall submit all such revisions to the Project Manager.

18.3 **Progress Report**

The Contractor shall monitor progress of all the activities specified in the program referred to in CC Sub-Clause 18.2 (Program of Performance) above, and supply a progress report to the Project Manager every month.

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

18.4 **Progress of Performance**

If at any time the Contractor’s actual progress falls behind the program referred to in CC Sub-Clause 18.2 (Program of Performance), or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under CC Sub Clause 8.2 (Time for Commencement and Completion), any extension thereof entitled under CC Sub-Clause 40.1 (Extension of Time for Completion), or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

18.5 **Work Procedures**

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

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

19. **Subcontracting**

19.1 Appendix 5 (List of Approved Subcontractors) to the Contract Agreement specifies major items of
supply or services and a list of approved Subcontractors against each item, including vendors. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract.

19.2 The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in CC Sub-Clause 19.1.

19.3 For items or parts of the Facilities not specified in Appendix 5 (List of Approved Subcontractors) to the Contract Agreement, the Contractor may employ such Subcontractors as it may select, at its discretion.

20. Design and Engineering

20.1 Specifications and Drawings

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

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

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

20.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied after approval by the Employer and shall be treated in accordance with CC Clause 39.3 (Changes Originating from Contractor).

20.3 Approval/Review of Technical Documents by Project Manager

20.3.1 The Contractor shall prepare (or cause its subcontractors to prepare) and furnish to the Project Manager the documents listed in Appendix-7(List of Documents for Approval or Review) to the Contract Agreement for its approval or review as specified and as in accordance with the requirements of CC sub-Clause 18.2 (Program of Performance).

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

CC sub-Clause 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager’s approval, but not to those furnished to the Project Manager for its review only.

20.3.2 Within twenty one (21) days after receipt by the Project Manager of any document requiring the Project Manager’s approval in accordance with CC Sub-Clause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefore and the modifications that the Project Manager proposes.

20.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good engineering practice.
20.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager’s approval in accordance with CC sub-Clause 20.3.2. If the Project Manager approves the documents subject to modification(s), the Contractor shall make the required modifications the document shall be deemed to have been approved.

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

20.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the parties within a reasonable period, then such dispute or difference may be referred to an Arbitration for determination in accordance with CC Sub Clause 6.2 (Arbitration) hereof. If such dispute or difference is referred to Arbitration, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Arbitration upholds the Contractor's view on the dispute and if the Employer has not given notice under CC Sub Clause 6.2 (arbitration), then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Arbitration shall decide, and the Time for Completion shall be extended accordingly.

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

20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this CC Sub-Clause 20.3. If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of CC Clause 39 (Change in the Facilities) shall apply to such request.

21. Procurement

21.1 Plant and Equipment

Subject to CC Sub-Clause 18.2, the Contractor shall manufacture or procure and transport all the Plant and Equipment in an expeditious and orderly manner to the Site.

21.2 Employer-Supplied Plant, Equipment, and Materials

If Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement provides that the Employer shall furnish any specific items of machinery, equipment or materials to the Contractor, the following provisions shall apply:

21.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to CC Sub-Clause 18.2 (Program of Performance), unless otherwise mutually agreed.

21.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this CC Sub-21.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.

21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under CC Clause 27 (Defect Liability) or under any other provision of Contract.
21.3 **Transportation**

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

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

21.3.3 Upon despatch of each shipment of the Plant and Equipment and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile or Electronic Data Interchange (EDI) of the description of the Plant and Equipment and of the Contractor's Equipment, the point and means of despatch, and the estimated time and point of arrival in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties.

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

21.4 **Customs Clearance**

The Contractor shall, at its own expense, handle all imported Plant and Equipment and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance including liabilities for port charges if any, subject to the Employer's obligations under CC sub-Clause 14.4, provided that if applicable laws or regulations require any application or act to be made by or in the name of the employer, the employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance due to the fault of the employer, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to CC Clause 40.

21.5 **Delivery and Documents**

21.5.1 **For Imported Goods**

Upon shipment, the Contractor shall notify the Employer and the Insurance company by cable or telex of the full details of the shipment including Contract number, description of goods, quantity, the vessel, the bill of lading/Airway Bill number and date, port of loading, date of shipment, port of discharge, etc. The Contractor shall mail the following documents to the Employer, with a copy to the Insurance Company:

1) Copies of the Contractor's invoice showing Contract Agreement reference, goods description, quantity, unit price, total amount;

2) Original (3/3) and six copies of the negotiable, clean on-board bill of lading/Air way Bill marked freight prepaid and six copies of non negotiable bill of lading / Airway Bill;

3) Copies of packing list identifying contents of each package(6 copies);

4) Original insurance policy certification (3 copies);

5) Manufacturer's / Contractor's guarantee certificate of Quality;

6) Material Inspection & Clearance Certificate (MICC) for dispatch, issued by the Employer's representative and the Contractor's factory inspection report, test certificates( 3 copies); and

7) Certificate of origin.

The above documents shall be air mailed/faxed by the Contractor to reach the Employer with in one week from date of shipment to enable the Employer to make progressive payment to the Contractor and also make necessary arrangement for payment of custom duties etc. The
Contractor will be responsible for any consequent expenses due to delay in furnishing the above documentation.

21.5.2 For Domestic Goods

Upon shipment, the Contractor shall notify the employer and the Insurance Company by cable or telex of the full details of the dispatch including Contract number, description of goods, quantity, R/R or L/R number and date, place of loading, date of dispatch etc. The Contractor shall mail the following documents to the Employer, with a copy to Insurance Company:

1) Copies of the Contractor’s invoice showing Contract Agreement reference, goods description, quantity, unit price, total amount(6 copies);

2) Copies of packing list identifying contents of each package(6 Copies);

3) Railway receipt / Received LR ;

4) Manufacturer’s / Contractor’s guarantee certificate of Quality.

5) Material Inspection & Clearance Certificate (MICC) for dispatch issued by the Employer’s representative and the Contractor’s factory inspection report & test certificate (3 copies) and insurance certificate (3 copies); and

6) Certificate of origin.

21.6 Packing

21.6.1 The Contractor shall provide such packing of the Goods as it is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods final destination and the absence of heavy handling facilities at all points in transit.

21.6.2 The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to any subsequent instruction ordered by the Employer consistent with the requirements of the Contract.

21.7 Indemnity Bond

For the equipment/material to be provided by the Contractor, it will be the responsibility of the Contractor to take delivery, unload and store the material at Site and execute an Indemnity Bond in favour of the Employer against loss, damage and any risks involved for the full value of the material and obtain authorization letter from Employer as per proforma given at Section-IV. This Indemnity Bond shall be furnished by the Contractor before commencement of the supplies and shall be valid till the scheduled date of Operational Acceptance of the equipment by the Employer.

22. Installation

22.1 Setting Out/Supervision/Labour

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

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

22.1.2 Contractor’s Supervision:

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

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

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

(c) The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from
the appropriate authorities for the entry of all labour and personnel to be employed on the Site
into the country where the Site is located.

(d) The Contractor shall at its own expense provide the means of repatriation to all of its and its
Subcontractor's personnel employed on the Contract at the Site to their various home countries.
It shall also provide suitable temporary maintenance of all such persons from the cessation of
their employment on the Contract to the date programmed for their departure. In the event that
the Contractor defaults in providing such means of transportation and temporary maintenance,
the Employer may provide the same to such personnel and recover the cost of doing so from the
Contractor.

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

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

22.2 **Contractor's Equipment**

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

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

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

22.3 **Site Regulations and Safety**

The Employer and the Contractor shall establish Site regulations setting out the rules to be
observed in the execution of the Contract at the Site and shall comply therewith. The Contractor
shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site
regulations for the Employer's approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety
of the Facilities, gate control, sanitation, medical care, and fire prevention.

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

22.3.1.2 The Contractor shall keep the employer indemnified against any action 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.

22.3.1.3 If the Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or as 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 Employer shall have the right to deduct any money due to the Contractor under this contract or any other contract with employer including his amount of performance security for adjusting the aforesaid payment. The Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

22.3.1.4 Some major laws along with their latest amendments applicable to establishments engaged in building and other construction works:

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

b) Payment of Gratuity Act 1972: 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 the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

c) Employee P.F. and Miscellaneous Provision Act 1952: The Act provides for monthly contribution by the employer plus workers @ 10% or 8.33%. The benefits under the Act are:
   1) Pension or family pension on retirement or death, as the case may be.
   2) Deposit linked insurance on death in harness of the worker.
   3) Payment of P.F. accumulation on retirement/death etc.

d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

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

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

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

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

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

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

k) Industrial Employment (Standing Orders) Act 1946: 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 get the same certified by the designated Authority.

l) 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.


n) 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 upto the establishment and back, etc.

o) 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% 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.

p) Factories Act 1948: The Act lays down the procedure for approval of 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 in manufacturing process.

22.3.2 Protection of Environment

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

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

Salient features of some of the major laws that are applicable are given below:

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

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

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

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

22.4 Opportunities for Other Contractors

22.4.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site.

22.4.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

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

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

22.5 Emergency Work

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

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefore. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.

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

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

22.7 Watching and Lighting

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

22.8 Work at Night and on Holidays

22.8.1 Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the Site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Project Manager, provided that provisions of this CC Sub-Clause 22.8.1 shall not apply to any work which is customarily carried out by rotary or double-shifts.

22.8.2 Notwithstanding CC Sub-Clauses 22.8.1 or 22.1.3, if and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Employer’s consent thereto, the Employer shall not unreasonably withhold such consent.

23. Test and Inspection

23.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and Equipment and any part of the Facilities as are specified in the Contract.

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

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

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

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

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

23.6 If any Plant and Equipment or any part of the Facilities fails to pass any test and/or inspection,
the Contractor shall either rectify or replace such Plant and Equipment or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under CC Sub-Clause 23.3. If the inspection is not materialized due to the reasons attributable to contractor then all the expenses including to & fro airfare and TA, DA shall be to the account of the contractor.

23.7 If any dispute or difference of opinion shall arise between the parties in connection with or arising out of the test and/or inspection of the Plant and Equipment or part of the Facilities that cannot be settled between the parties within a reasonable period of time, it may be referred to an Arbitration for determination in accordance with CC Sub-Clause 6.2

23.8 The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Plant and Equipment are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.

23.9 The Contractor agrees that neither the execution of a test and/or inspection of Plant and Equipment or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to CC Sub-Clause 23.4, shall release the Contractor from any other responsibilities under the Contract.

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

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

If any part of the Facilities or foundations have been covered up at the Site after compliance with the requirement of CC Sub-Clause 23.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

24. Completion of the Facilities

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

24.2 Within seven (7) days after receipt of the notice from the Contractor under CC Sub-Clause 24.1, the Employer shall supply the operating and maintenance personnel specified in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement for Pre-commissioning of the Facilities or any part thereof.

Pursuant to Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement, the Employer shall also provide, within the said seven (7) day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Pre-commissioning of the Facilities or any part thereof.

24.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters if so specified in Appendix-6 (scope of works and supply by the Employer) have been provided by the Employer in accordance with CC Sub-Clause 24.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning.

24.4 As soon as all works in respect of Pre-commissioning are completed and in the opinion of the Contractor, the facilities or any part thereof is ready for commissioning, the contractor shall
commence Commissioning as per procedures stipulated in Technical Specification and as soon as Commissioning is satisfactorily completed, the Contractor shall so notify the Project Manager in writing. (Also refer CC 25.2.3)

24.5 The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under CC Sub-Clause 24.4, either issue a Completion Certificate in the form specified in the Forms and Procedures section in the bidding documents, stating that the Facilities or that part thereof have reached Completion as at the date of the Contractor's notice under CC Sub-Clause 24.4, or notify the Contractor in writing of any defects and/or deficiencies.

If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in CC Sub-Clause 24.4.

If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within seven (7) days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as at the date of the Contractor's repeated notice.

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

24.6 If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under CC Sub-Clause 24.4 or within seven (7) days after receipt of the Contractor's repeated notice under CC Sub-Clause 24.5, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be.

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

25. Commissioning and Operational Acceptance

25.1 Commissioning

25.1.1 Commissioning of the Facilities or any part thereof shall be completed by the Contractor as per procedures detailed in Technical Specifications.

If any Plant and Equipment or any part of the Facilities fails during Commissioning, the Contractor shall either rectify (if fault is minor) or replace such Plant and Equipment or part of the Facilities.

25.1.2 The Employer shall unless otherwise specified in Technical Specifications supply the operating and maintenance personnel and all raw material, utilities, lubricants, chemicals, catalysts, facilities, service and other matters required for Commissioning.

25.1.3 Trial – Operation

25.1.3.1 Trial – Operation of the Facilities or any part thereof shall be commenced by the Contractor immediately after the Commissioning is completed pursuant to CC Sub-Clause 25.1.1

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

25.1.3.3 At any time after the events set out in CC Sub-Clause 25.1.3.2 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Taking Over Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as on the date of such notice.
25.1.3.4 The Project Manager shall within twenty-one (21) days after receipt of the Contractor's notice, issue an Taking Over Certificate.

25.1.4 Taking Over

25.1.4.1 Upon successful Trial – Operation of the Facilities or any part thereof, pursuant to CC Sub-Clause 25.1.3, the Project Manager shall issue to the Contractor a Taking Over Certificate as a proof of the acceptance of the Facilities or any part thereof. Such certificate shall not relieve the Contractor of any of his obligations which otherwise survive, by the terms and conditions of Contract after issue of such certificate.

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

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

25.2 Guarantee Test

25.2.1 The Guarantee Test (and repeats thereof) shall be conducted by the Contractor after successful trial-operation of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Contract Documents. The Contractor's and Project Manager's advisory personnel shall attend the Guarantee Test. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test (and any repeats thereof).

25.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Completion specified in the CC or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and CC Sub-Clauses 28.2 and 28.3 shall not apply.

The Guarantee Test of the Facilities shall be successfully completed within twenty-six weeks from the date of Completion.

25.2.3 Completion- Guarantee test- acceptance

In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to Sub-Clause 24.3, or with the Guarantee Test pursuant to Sub-Clause 25.2, for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions leading to "deemed" completion of activities such as Completion of the Facilities, pursuant to CC Sub-Clause 24.6, Operational Acceptance, pursuant to CC Sub-Clause 25.3.4, Contractor’s obligations regarding Defect Liability Period, pursuant to CC Sub Clause 27.2, Functional Guarantee, pursuant to CC Clause 28, Care of Facilities, pursuant to CC Clause 32, and Suspension, pursuant to CC Sub-Clause 41.1, shall not apply. In this case, the following provisions shall apply.

25.2.3.1 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above Sub-Clause CC 25.2.3, the Contractor shall be entitled to the following:

a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to CC Sub-Clause 26.2.

b) payments due to the Contractor in accordance with the provisions specified in Appendix I (terms and Procedures of Payment) to the Contract Agreement, which would have not been payable in normal circumstances due to non-completion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null
and void when the Contractor will have complied with its obligations regarding these payments, subject to the provisions of Sub-Clause CC 25.2.3.2 below.

c) the expenses toward the above security and extension of other securities under the Contract, of which validity need to be extended, shall be reimbursed to the Contractor by the Employer.

d) the additional charges toward the care of the Facilities pursuant to CC Sub-Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause CC 25.2.3.3 below. The provisions of CC sub-Clause 33.2 shall apply to the Facilities during the same period.

25.2.3.2 In the event that the period of suspension under Sub-Clause CC 25.2.3 actually exceeds one hundred eighty (180) days, the Employer and the Contractor shall mutually agree to any additional compensation payable to the Contractor.

25.2.3.3 When the Contractor is notified by the Project Manager that the Facilities are ready for Pre-commissioning, the Contractor shall proceed without delay in performing all activities and obligations under the Contract.

25.3 Operational Acceptance

25.3.1 Subject to CC Sub-Clause 25.4 (Partial Acceptance) below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

(a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or

(b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion specified in the CC or any other agreed upon period as specified in CC Sub-Clause 25.2.2 above but successful completion of the facilities has been achieved; or

(c) the Contractor has paid the liquidated damages specified in CC Sub Clause 28.3 hereof; and

(c) any minor items mentioned in CC Sub-Clause 24.7 hereof relevant to the Facilities or that part thereof have been completed.

(e) as built drawings, and operating and maintenance manuals and CD’s etc. as per Technical Specifications of the Bidding Documents are furnished.

25.3.2 At any time after any of the events set out in CC Sub-Clause 25.3.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as at the date of such notice.

25.3.3 The Project Manager shall, after consultation with the Employer, and within twenty-one (21) days after receipt of the Contractor’s notice, issue an Operational Acceptance Certificate.

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

25.4 Partial Acceptance

25.4.1 If the Contract specifies that Completion and Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities.
25.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the Project Manager shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

F. Guarantees and Liabilities

26. Completion Time Guarantee

26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified in the CC) within the Time for Completion specified in the CC pursuant to CC Sub-Clause 8.2, or within such extended time to which the Contractor shall be entitled under CC Clause 40 (Extension of Time for Completion) hereof.

26.2 If the Contractor fails to comply with the Time for Completion in accordance with Clause CC 26 for the whole of the facilities, (or a part for which a separate time for completion is agreed) then the Contractor shall pay to the Employer a sum equivalent to half percent (0.5%) of the Contract Price as liquidated damages for such default and not as a penalty, without prejudice to the Employer's other remedies under the Contract, for each week or part thereof which shall elapse between the relevant Time for Completion pursuant to Clause 26.1 above and the date stated in Taking Over Certificate of the whole of the Works (or a part for which a separate time for completion is agreed) subject to the limit of five percent (5%) of Contract Price. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

For the application of liquidated damages, the schedule date for Taking Over of the entire system shall be the basis, and not intermediate schedule milestone.

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

27. Defect Liability

27.1 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed.

27.2 The Defect Liability Period shall be five years from the date of Operational Acceptance of the facilities (or any part thereof).

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

(a) improper operation or maintenance of the Facilities by the Employer
(b) operation of the Facilities outside specifications provided in the Contract
(c) normal wear and tear.

27.3 The Contractor’s obligations under this CC Clause 27 shall not apply to

(a) any materials that are supplied by the Employer under CC Sub-Clause 21.2 (Employer-Supplied Plant, Equipment and Materials), are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein.

(b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein.
(c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under CC Sub-Clause 27.7.

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

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this CC Clause 27. The Contractor may, with the consent of the Employer, remove from the Site any Plant and Equipment or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

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

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

The tests in character shall in any case be not less than what has already been agreed by the employer and the Contractor for the original equipment/part of the Facilities.

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

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

Upon correction of the defects in the Facilities or any part thereof by repair/replacement, such repair/replacement shall have the Defect Liability Period extended by a period of Sixty (60) months from the time such replacement/repair of the facilities or any part thereof.

27.8.1 At the end of Defect Liability Period, the Contractor's liability ceases except for latent defects. The Contractor's liability for latent defects warranty shall be limited to period of five (5) years from the end of Defect Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency, which do not manifest themselves during the Defect Liability Period defined in this CC Clause 27, but later.

27.9 Except as provided in CC Clauses 27 and 33 (Loss of or Damage to Property/ Accident or Injury to Workers/Indemnification), the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant and Equipment, design or engineering or work executed that appear after operational acceptance or any part thereof, except where such defects are the result of the gross negligence, fraud, criminal or willful action of the Contractor.

27.10 In addition, the Contractor shall also provide an extended warranty for any such component of the Facilities and during the period of time as may be specified in the CC. Such obligation shall be in addition to the defect liability specified under CC Sub-Clause 27.2.

28. Functional Guarantee

28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement, subject to and upon the conditions therein specified.

28.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement are not met either in
whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract pursuant to CC Sub-Clause 42.2 and recover the payments already made to the Contractor.

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement is met, the Contractor shall, at the Employer's option, either

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

(b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in Appendix 8 (Functional Guarantees) to the Contract Agreement.

28.4 In case the Employer exercises its option to accept the equipment after levy of liquidated damages, the payment of liquidated damages under CC sub clause 28.3, upto the limitation of liability specified in the Appendix-8 (Functional Guarantees) to the Contract Agreement, shall completely satisfy the Contractor’s guarantees under CC Sub clause 28.3, and the Contractor shall have not further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.

28.5 Functional Guarantees, Liquidated Damages for Non-Performance

28.5.1 The bidder shall guarantee that the equipment offered shall meet the rating and performance requirements stipulated for various equipment covered in this specification. The bidder shall also furnish a declaration in the manner prescribed and included in the relevant schedule of Bid Form & Price Schedules for guarantees, which shall attract levy of liquidated damages for non-performance.

28.5.2 If the guarantees are not established at factory tests in case of power transformer & auxiliary transformer then the Employer at his discretion may reject or accept the equipment after assessing the liquidated damages as per table below in Clause 28.5.4 against the Contract and such amounts shall be deducted from the Contract Price or otherwise recovered from the Contractor.

28.5.3 In case of power Transformer and auxiliary Transformer, the measured loss for each equipment shall be corrected in accordance with IEC-289 & IEC-76 for the purpose of comparison of guaranteed losses with measured losses for levy of liquidated damages. However power Transformer and auxiliary Transformer under no circumstances shall be accepted if the measured losses are more than +15 percent of the guaranteed losses at rated voltage quoted by the bidders.

28.5.4 Differential Price Factors for Evaluation and Liquidated Damages

(a) The factors and the respective Indian Rupees value per unit of differential loss for the purpose of calculation of differential price for the bid evaluation as specified in 24.6 (e) of ITB and Liquidated Damages shall be as stipulated below:-

<table>
<thead>
<tr>
<th>S.N.o</th>
<th>Equipment</th>
<th>Parameter to be taken for applying differential price factor(F)</th>
<th>Value of F in Indian Rupees per unit of parameter differential per kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>A)</td>
<td><strong>60 MVA Power transformer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>Differential copper loss (kw)</td>
<td>@ Rs.69900/-</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>Differential iron loss (kw)</td>
<td>@ Rs.171300/-</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>Differential Cooler loss (kw)</td>
<td>@ Rs.68500/-</td>
<td></td>
</tr>
</tbody>
</table>
(b) For bid evaluation, the best parameter of loss quoted at rated voltage, rated frequency, rated current and at 75°C by any technical responsive bidder shall be taken as basis and that quoted by the particular bidder shall be used to arrive at differential price to be applied for the bid.

29. Patent Indemnity

29.1 The Contractor shall, subject to the Employer's compliance with CC Sub Clause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.

29.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in CC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

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

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

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

30. Limitation of Liability

30.1 Except in cases of criminal negligence or willful misconduct,

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

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

G. Risk Distribution

31. Transfer of Ownership
31.1 Ownership of the plant and equipment (including spare parts) to be imported into the country where the site is located shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Plant and Equipment from the country of origin to that country and upon endorsement of the dispatch documents in favour of Employer.

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

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

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

31.5 Notwithstanding the transfer of ownership of the Plant and Equipment, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to CC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant and Equipment are incorporated.

32. Care of Facilities

32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to CC Clause 24 (Completion of the Facilities) or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to CC Clause 27 (Defect Liability). Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of CC Sub Clauses 32.2 and 38.1.

32.2 If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of

(a) (insofar as they relate to the country where the Site is located) nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under CC Clause 34 (Insurance) hereof

(b) any use or occupation by the Employer or any third party (other than a Subcontractor) authorized by the Employer of any part of the Facilities

(c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein, The Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with CC Clause 39 (Change in the Facilities). If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either make a change in accordance with CC Clause 39 (Change in the Facilities), excluding the performance of that part of the Facilities thereby lost, destroyed or damaged,
or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to CC Sub-Clause 42.1 (Termination for Employer's Convenience) hereof, except that the Contractor shall have no entitlement to profit under paragraph (e) of CC Sub-Clauses 42.1.3 in respect of any unexecuted Facilities as at the date of termination.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in CC Sub-Clause 32.2 (with respect to the Contractor's temporary facilities), and (ii) where such loss or damage arises by reason of any of the matters specified in CC Sub-Clauses 32.2 (b) and (c) and 38.1.

32.4 With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor's Equipment by reason of any of the matters specified in CC Sub-Clause 38.1, the provisions of CC Sub-Clause 38.3 shall apply.

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

33.1 Subject to CC Sub-Clause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property (other than the Facilities whether accepted or not), arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under CC Sub-Clause 33.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

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

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

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under CC Clause 34 (Insurance), provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.

33.4 The party entitled to the benefit of an indemnity under this CC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.

34. Insurance

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

Covering loss or damage occurring while in transit from the Contractor's or Subcontractor's works or stores until arrival at the Site, to the Plant and Equipment (including spare parts thereof) and to the Contractor's Equipment.

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property occurring in connection with the supply and installation of the Facilities.

(d) Automobile Liability Insurance

Covering use of all vehicles used by the Contractor or its Subcontractors (whether or not owned by them) in connection with the execution of the Contract.

(e) Workers' Compensation

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(f) Employer's Liability

In accordance with the statutory requirements applicable in any country where the Contract or any part thereof is executed.

(g) Other Insurances

Such other insurances as may be specifically agreed upon by the parties hereto as listed in the said Appendix 3.

34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub-Clause 34.1, except for the Third Party Liability, Workers' Compensation and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub-Clause 34.1 except for the Cargo Insurance During Transport, Workers' Compensation and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insured for losses or claims arising out of the performance of the Contract shall be waived under such policies.

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

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

34.5 The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in Appendix 3 (Insurance Requirements) to the Contract Agreement, in the sums and with the deductibles and other conditions specified in the said
Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insureds under all such policies. All insurers' rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this CC Sub-Clause 34.5.

34.6 If the Contractor fails to take out and/or maintain in effect the insurances referred to in CC Sub-Clause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due to the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in CC 34.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due to the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer, and the Contractor shall have full recourse against the Employer for any and all liabilities of the Employer herein.

34.7 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this CC Clause 34, and the monies payable by any insurers under all the insurance except Third Party Liability Insurance, Workers' Compensation, and Employer's Liability, shall be paid to the joint account of the Employer and the Contractor such amounts paid shall be apportioned between the Employer and the Contractor in accordance with the respective responsibilities under the Contract. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.

35. Unforeseen Conditions

35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions (other than climatic conditions) or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site (if access there to was available) or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant and Equipment or Contractor's Equipment, notify the Project Manager in writing of

(a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen
(b) the additional work and/or Plant and Equipment and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions
(c) the extent of the anticipated delay
(d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this CC Sub-Clause 35.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial
obstructions referred to in CC Sub-Clause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.

35.3 If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in CC Sub-Clause 35.1, the Time for Completion shall be extended in accordance with CC Clause 40 (Extension of Time for Completion).

36. Change in Laws and Regulations

36.1 If, after the date twenty-eight (28) days prior to the date of Bid submission, in the country where the Site is located, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. However, these adjustments would be restricted to direct transactions between the Employer and the Contractor and not on procurement of raw materials, intermediary components etc. by the Contractor. Further, no adjustment of the Contract Price shall be made on account of variation in deemed export benefits. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the Appendix 2 to the Contract Agreement.

37. Force Majeure

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

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

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

(c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority

(d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague

(e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster

(f) shortage of labour, materials or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

37.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with CC Clause 40 (Extension of Time for Completion).

37.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their
obligations under the Contract, but without prejudice to either party's right to terminate the Contract under CC Sub Clauses 37.6 and 38.5.

37.5 No delay or nonperformance by either party hereto caused by the occurrence of any event of Force Majeure shall

(a) constitute a default or breach of the Contract

(b)(subject to CC Sub-Clauses 32.2, 38.3 and 38.4) give rise to any claim for damages or additional cost or expense occasioned thereby if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

37.6. If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which the dispute will be resolved in accordance with CC Clause 6.

37.7. Notwithstanding CC Sub-Clause 37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.

38. War Risks

38.1 "War Risks" shall mean any event specified in paragraphs (a) and (b) of CC Sub-Clause 37.1 and any explosion or impact of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, occurring or existing in or near the country (or countries) where the Site is located.

38.2 Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to

(a) destruction of or damage to Facilities, Plant & Equipment, or any part thereof

(b) destruction of or damage to property of the Employer or any third party

(c) injury or loss of life if such destruction, damage, injury or loss of life is caused by any War Risks, and the Employer shall indemnify and hold the Contractor harmless from and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges or expenses arising in consequence of or in connection with the same.

38.3 If the Facilities or any Plant and Equipment or Contractor's Equipment or any other property of the Contractor used or intended to be used for the purposes of the Facilities shall sustain destruction or damage by reason of any War Risks, the Employer shall pay the Contractor for

(a) any part of the Facilities or the Plant and Equipment so destroyed or damaged (to the extent not already paid for by the Employer)

(b) replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged,

(c) replacing or making good any such destruction or damage to the Facilities or the Plant and Equipment or any part thereof so far as may be required by the Employer, and as may be necessary for completion of the facilities.

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with CC Clause 39 (Change in the Facilities), excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to CC Sub-Clause 42.1 (Termination for Employer's Convenience).

38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract that are in any way attributable to, consequent on, resulting from, or in any way connected with any War Risks, provided that the Contractor shall as soon as practicable notify the Employer in writing of any
such increased cost.

38.5 If during the performance of the Contract any war risks shall occur that financially or otherwise materially affect the execution of the Contract by the Contractor with due and proper consideration given to the safety of its and its Subcontractors personal engaged in the work on the facilities, provided, however, that if the execution of the work on the facilities becomes impossible or is substantially prevented for a single period of more than sixty (60) days or an aggregate period of more the one hundred and twenty (120) days on account of any war Risks, the parties will attempt to develop a mutually satisfactory solution, failing which the dispatch will be resolved in accordance with CC Clause 6.

38.6 In the event of termination pursuant to CC Sub Clause. 38.3, the rights and obligation of the employer and the Contractor shall be as specified in CC Sub-Clause 42.1.2 and 42.1.3, except that the Contractor shall have no entitlement to profit under paragraph (e) of CC Sub Clause 42.13 in respect of any unexecuted facilities as of the date of termination.

H. Change in Contract Elements

39. Change in the Facilities

39.1 Introducing a Change

39.1.1 Subject to CC Sub-Clauses 39.2.5 and 39.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities (hereinafter called "Change"), provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.

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

39.1.3 Notwithstanding CC Sub-Clauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.

39.1.4 The procedure on how to proceed with and execute Changes is specified in CC Sub-Clauses 39.2 and 39.3, and further details and sample forms are provided in the Sample Forms and Procedures section in the bidding documents.

39.2 Changes Originating from Employer

39.2.1 If the Employer proposes a Change pursuant to CC Sub-Clause 39.1.1, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the Project Manager as soon as reasonably practicable a "Change Proposal," which shall include the following:

(a) brief description of the Change
(b) effect on the Time for Completion
(c) estimated cost of the Change
(d) effect on Functional Guarantees (if any)
(e) effect on any other provisions of the Contract.

39.2.2 Prior to preparing and submitting the "Change Proposal," the Contractor shall submit to the Project Manager an "Estimate for Change Proposal," which shall be an estimate of the cost of preparing and submitting the Change Proposal. Upon receipt of the Contractor's Estimate for Change Proposal, the Employer shall do one of the following:
(a) accept the Contractor's estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal

(b) advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate

(c) advise the Contractor that the Employer does not intend to proceed with the Change.

39.2.3 Upon receipt of the Employer's instruction to proceed under CC Sub-Clause 39.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with CC Sub-Clause 39.2.1.

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

39.2.5 If before or during the preparation of the change proposal it becomes apparent that the aggregate effect of compliance therewith and with all other change orders that have already become binding upon the contractor under this CC Clause 39 would be to increase or decrease the contractor price as originally set forth in Article-2 (Contract price and Terms of payment) of the contract agreement by more than fifteen (15) percent, the Contractor may give a written notice of objection there to prior to furnish the change proposal as aforesaid. If the employer accept the contractors objection, the employer and the contractor shall agree on specific rates for valuation of the change.

The Contractor failure to so object shall neither affect its right to object to any subsequent requested change or change orders herein, nor affect its right to taken into account, when making such subsequent objection, the percentage increase or decrease in the contract price that any change not objected to by the contractor represents.

39.2.6 If rates and prices of any change are not available in the contract, the parties thereto shall agree on specific rates for the valuation of the change. Upon receipt of the change proposal, the employer and the contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the employer shall, if it intends to proceed with change, issue the contractor with a change order.

If the employer is unable to reach a decision within fourteen (14) days, it shall notify the contractor with details of when the contractor can expect a decision.

If the employer decides not to proceed with the change for whatever reason, it shall, with in the said period of fourteen (14) days, notify the contractor accordingly. Under such circumstances, the contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the change proposal, provided that these do not exceed the amount given by the Contractor in its estimate for change proposal submitted in accordance with CC Sub – Clause 39.2.2.

39.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order."

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

If the parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Arbitration in accordance with the provisions of CC Sub-Clause 6.2 (Arbitration).

39.3 Changes Originating from Contractor

39.3.1 If the Contractor proposes a Change pursuant to CC Sub-Clause 39.1.2, the Contractor shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in CC Sub-Clause 39.2.1.
Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in CC Sub-Clauses 39.2.6 and 39.2.7. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.

39.4 The scope of work under the package(s) shall be as per the Technical Specification, Vol- II of bidding Documents. The quantity variation applicable for the existing scope shall be generally as per the following.

a) The employer reserves the right to increase or decrease the quantity of different items of the specified good and services to the extent of fifteen percent (15%) of the contract prices, by way of suitable amendment to the contract, without any change in unit rate/price and/or other terms and conditions of the contract. However, the quantities of individual items of goods and services may vary up to any extent.

b) The contract price for (i) items for which quantities have been indicated as lumpsum / lot/set (ii) items for which quantities were to be estimated by the bidder, including additional items (falling under (i) and/or (ii) considered necessary by the bidder for successful completion of the works as per TS and indicated by him in his bid, shall remain constant unless there is change made in the scope of work by the employer. The quantities and unit prices (a) subsequently arrived while approving the bill of quantities (BOQ)/ billing breakup of lumpsum/lot/set quantities and/or (b) quantities estimated by the bidder/contractor shall be for on account payment purpose only. In case additional quantities, over and above the quantities in BOQ/billing break up and/or estimated by the bidder/contractor are required for the successful completion of the scope of work as per technical specification, the contractor shall execute additional quantities of these items for which no additional payments shall be made over and above the lumpsum contract price.

In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be property of the contractor and contractor shall be allowed to take back the same from the site for which no deduction from the lumpsum contract price shall be made. Further in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ/billing break up and/or estimated by the bidder/contractor, the lumpsum contract price shall remain unchanged and no deduction shall be made from the lumpsum price due to such reduction of quantities. It shall be the responsibility of the bidder to pay all statutory taxes, duties and levies to the concerned authority’s surplus material which would otherwise have been, lawfully payable. The bidder shall submit an indemnity bond to keep the employer harmless from any liability, before release to such material to the bidder by the employer.

c) The quantity variation from the existing scope shall be notified to the contractor within the validity of contract.

40. Extension of Time for Completion

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

(a) any Change in the Facilities as provided in CC Clause 39 (Change in the Facilities)

(b) any occurrence of Force Majeure as provided in CC Clause 37 (Force Majeure), unforeseen conditions as provided in CC Clause 35 (Unforeseen Conditions), or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of CC Sub-Clause 32.2

(c) any suspension order given by the Employer under CC Clause 41 (Suspension) hereof or reduction in the rate of progress pursuant to CC Sub-Clause 41.2 or

(d) any changes in laws and regulations as provided in CC Clause 36 (Change in Laws and Regulations) or

(e) any default or breach of the Contract by the Employer, specifically including failure to supply the items listed in Appendix 6 (Scope of Works and Supply by the Employer) to the Contract Agreement, or any activity, act or omission of any other contractors employed by the Employer or
(f) any other matter specifically mentioned in the Contract;

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

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the
Project Manager a notice of a claim for an extension of the Time for Completion, together with
particulars of the event or circumstance justifying such extension as soon as reasonably
practicable after the commencement of such event or circumstance. As soon as reasonably
practicable after receipt of such notice and supporting particulars of the claim, the Employer and
the Contractor shall agree upon the period of such extension. In the event that the Contractor
does not accept the Employer's estimate of a fair and reasonable time extension, the Contractor
shall be entitled to refer the matter to an Arbitration, pursuant to CC Sub-Clause 6.2 (Arbitration).

40.3 The Contractor shall at all times use its reasonable efforts to minimize any delay in the
performance of its obligations under the Contract.

41. Suspension

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

If, by virtue of a suspension order given by the Project Manager, other than by reason of the
Contractor's default or breach of the Contract, the Contractor's performance of any of its
obligations is suspended for an aggregate period of more than ninety (90) days, then at any time
thereafter and provided that at that time such performance is still suspended, the Contractor may
give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28)
days of receipt of the notice, order the resumption of such performance or request and
subsequently order a change in accordance with CC Clause 39 (Change in the Facilities),
excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the
Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a
deletion of such part in accordance with CC Clause 39 (Change in the Facilities) or, where it
affects the whole of the Facilities, as termination of the Contract under CC Sub-Clause 42.1
(Termination for Employer's Convenience).

41.2 In case,

(a) the Employer has failed to pay the Contractor any sum due under the Contract within the
specified period, has failed to approve any invoice or supporting documents without just
cause pursuant to Appendix 1 (Terms and Procedures of Payment) to the Contract
Agreement, or commits a substantial breach of the Contract, the Contractor may give a
notice to the Employer that requires payment of such sum, with interest thereon as stipulated
in CC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or
specifies the breach and requires the Employer to remedy the same, as the case may be. If
the Employer fails to pay such sum together with such interest, fails to approve such invoice
or supporting documents or give its reasons for withholding such approval, or fails to remedy
the breach or take steps to remedy the breach within fourteen (14) days after receipt of the
Contractor's notice or

(b) the Contractor is unable to carry out any of its obligations under the Contract for any reason
attributable to the Employer, including but not limited to the Employer's failure to provide
possession of or access to the Site or other areas in accordance with CC Sub-Clause 10.2,
or failure to obtain any governmental permit necessary for the execution and/or completion of
the Facilities; then the Contractor may by fourteen (14) days' notice to the Employer suspend
performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor's performance of its obligations is suspended or the rate of progress is reduced
pursuant to this CC Clause 41, then the Time for Completion shall be extended in accordance
with CC Sub-Clause 40.1, and any and all additional costs or expenses incurred by the
Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.

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

42. Termination

42.1 Termination for Employer's Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this CC Sub-Clause 42.1.

42.1.2 Upon receipt of the notice of termination under CC Sub-Clause 42.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

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

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

(c) remove all Contractor's Equipment from the Site, repatriate the Contractor's and its Subcontractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition

(d) In addition, the Contractor, subject to the payment specified in CC SubClause 42.1.3, shall

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

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

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

42.1.3 In the event of termination of the Contract under CC Sub-Clause 42.1.1, the Employer shall pay to the Contractor the following amounts:

a. The Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as on the date of termination

b. The costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel

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

d. Costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of CC Sub-Clause 42.1.2

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

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefore to the Contractor, referring to this CC Sub-Clause 42.2:

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

(b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of CC Clause 43 (Assignment).

(c) if the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this sub-clause:

"corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.

"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 Employer, 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 Employer of the benefits of free and open competition".

42.2.2 If the Contractor

(a) has abandoned or repudiated the Contract

(b) has without valid reason failed to commence work on the Facilities promptly or has suspended (other than pursuant to CC Sub-Clause 41.2) the progress of Contract performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed

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

(d) refuses or is unable to provide sufficient materials, services or labour to execute and complete the Facilities in the manner specified in the program furnished under CC Clause 18.2 (Program of Performance) at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended.

then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this CC Sub-Clause 42.2

42.2.3 Upon receipt of the notice of termination under CC Sub-Clauses 42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

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

(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to
(c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination

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

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

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

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

42.2.5 Subject to CC Sub-Clause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as at the date of termination, the value of any unused or partially used Plant and Equipment on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of CC SubClause 42.2.3. Any sums due to the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract.

42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined. If the sum that the Contractor is entitled to be paid, pursuant to CC SubClause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due to the Contractor under CC SubClause 42.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due to the Contractor under CC Sub-Clause 42.2.5, the Employer shall pay the balance to the Contractor.

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

42.3 Termination by Contractor

42.3.1 If

(a) The Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 1 (Terms and Procedures of Payment) of the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in CC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice, or
(b) The contractor is unable to carry out any of its obligations under the contract for any reason attributable to the employer, including but not limited to the employer’s failure to provide possession of or access to the site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities, which the employer is required to obtain as per provision of the contract as per relevant applicable laws of the country.

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this CC Sub-Clause 42.3.1, forthwith terminate the Contract.

42.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this CC Sub-Clause 42.3.2, if the Employer becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

42.3.3 If the Contract is terminated under CC Sub-Clauses 42.3.1 or 42.3.2, then the Contractor shall immediately

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

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

(c) remove all Contractor’s Equipment from the Site and repatriate the Contractor’s and its Subcontractor’s personnel from the Site

(d) In addition, the Contractor, subject to the payment specified in CC Sub-Clause 42.3.4, shall

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

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

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

42.3.4 If the Contract is terminated under CC Sub-Clauses 42.3.1 or 42.3.2, the Employer shall pay to the Contractor all payments specified in CC Sub-Clause 42.1.3, and reasonable compensation for all loss or damage sustained by the Contractor arising out of, in connection with or in consequence of such termination.

42.3.5 Termination by the Contractor pursuant to this CC Sub-Clause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by CC Sub-Clause 42.3.

42.4 In this CC Clause 42, the expression "Facilities executed" shall include all work executed, Installation Services provided, and Plant and Equipment acquired (or subject to a legally binding obligation to purchase) by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this CC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the
43. **Assignment**

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

44. **Construction of the contract**

44.1 The contracts to be entered into with the successful bidder shall be as under.

For Domestic Bidder:

--- “First contract” for Ex-works supply and CIF supply, if any of all equipment and materials including mandatory spares identifying separately the CIF and Ex-works components of the supply.

--- “Second Contract” for providing all services i.e. inland transportation for delivery at site, unloading, storage handling at site, installation, testing and commissioning including performance testing in respect of all the equipments supplied under “First contract” and any other services specified in the contract documents.

44.2 The award of two (2) separate contracts shall not in any way dilute the responsibility of the contractor for the successful completion if the facility as per specification and breach in one contract shall automatically be construed as a breach of the other contract which will confer a right on the employer to terminate the other contract also at the risk and the cost of the contractor.

44.3 Deleted

44.4 Deleted

44.5 In case of two contracts entered into as above or where the employer hands over his equipment to the contractor for executing the contract then the contractor shall at the time of taking delivery of equipment through bill of lading or other dispatch documents, furnish trust receipt for plant, equipment and materials and also execute an indemnity bond in favour of the employer in the form acceptable to the employer for keeping the equipment in safe custody and to utilize the same exclusively for the purpose of the said Contract. Samples of Performa for the Trust receipt and Indemnity bond are enclosed under Section IV (Sample forms and procedures). The employer shall also issue separate authorization letter to the Contractor to enable him to take physical delivery of plant, equipment and materials from the employer as per Performa enclosed under Section IV (sample forms and procedures).

44.6 The Contract will be signed in two original and the contractor shall be provided with one signed original and the other signed original will be retained by the employer.

44.7 The contractor shall provide free of cost to the employer all the engineering data, drawing and descriptive materials submitted with the bid, in at least two (2) copies to form a part of the contract immediately after notification of Award.

44.8 Subsequent to signing of the contract, the contractor at his own cost shall provide the employer with at least fifteen (15) true copies of contract agreement within thirty (30) days after signing of the contract.

45. **Specific Requirement**

The bidder shall be responsible for safety of human and equipment during the working. It will be the responsibility of the Contractor to co-ordinate and obtain clearance from Electrical Inspector (Govt. of NCT of Delhi) before commissioning. Any additional items, modification due to observation of such statutory authorities shall be provided by the Contractor at no extra cost to the Employer. However the necessary fee of the Inspector shall be reimbursed by DTL.
Qualifying requirement of bidders for 220 kV level Power Transformer

Qualification of bidder will be based on meeting the minimum pass/fail criteria specified below regarding the Bidder’s technical experience and financial position as demonstrated by the Bidder’s responses in the corresponding Bid Schedules.

The Employer may assess the capacity and capability of the bidder, to successfully execute the scope of work covered under the package within stipulated completion period. This assessment shall inter-alia include (i) document verification; (ii) bidder’s work/manufacturing facilities visit; (iii) manufacturing capacity, details of works executed, works in hand, anticipated in future & the balance capacity available for the present scope of work; (iv) Details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (v) Details of quality systems in place; (vi) past experience and performance; (vii) customer feedback; (viii) banker’s feedback etc.

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

1.1 Technical Experience

1.1.1 The bidder should have designed, manufactured, tested, supplied, installed and commissioned 220 kV or above voltage class transformers of at least 100 MVA capacity. Transformers should have been in satisfactory operation for at least two (2) years as on the originally scheduled date of bid opening.

1.1.2 The 220 kV or above class transformer manufacturer(s) who have established production line in India for these equipment(s) based on technological support of a parent company or collaborator for the respective equipment(s) can also be considered provided.

i) Such manufacturer has designed, manufactured, tested, supplied, installed and commissioned 220kV or above class transformers.

ii) The parent company (Principals) or collaborator meets qualifying requirements stipulated at para 1.1.1 above; and

iii) The 220kV or above class transformer manufacturer(s) furnishes

a) a legally enforceable undertaking (jointly with the parent company or collaborator) to guarantee quality, timely supply, performance and warranty obligations as specified for the equipment(s); and

b) a confirmation letter from the parent company or collaborator along with the bid stating that Parent company or collaborator shall furnish performance guarantee for an amount of 10% of the cost of such equipment(s). This performance guarantee shall be in addition to Contract Performance Guarantee to be submitted by the Bidder.
In case bidder is a holding company, the technical experience referred to in clause 1.1.1 and 1.1.2 above shall be of that holding company only (i.e. excluding its subsidiary/ group companies). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 1.1.1 and 1.1.2 above shall be of that subsidiary company only (i.e. excluding its holding company).

1.2 FINANCIAL POSITION:

The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth for last 3 financial years should be positive.

b) Minimum Annual Average Turnover* (MAAT) for best three years out of last five financial years of the bidder should not be less than-

\[
\text{MAAT (Rs.)} = \text{Rs. 82,50,97,926.86/-}
\]

* Annual total income as incorporated in the profit and loss account excluding non-operating income, i.e. sale of fixed assets etc.

c) Bidder shall have Liquid Assets (LA) or / and evidence access to or availability of credit facilities not less than-

\[
\text{LA (Rs.)} = \text{Rs. 13,75,16,321.14/-}
\]

Note: In case completion period is less than one (1) year the denominator to calculate MAAT and LA shall be considered as one (1) and twelve (12) respectively. The bidders are required to submit Annual Financial Report (Balance Sheet and Profit & Loss A/C) of last five financial years (from original bid opening date). Annual financial statement should be duly certified by a Chartered Accountant for last five financial years and counter signed by bidders/Authorized signatory.

In case, bidder is a holding company, financial position criteria referred to in clause 1.2 above shall be that of holding company only (i.e. excluding its subsidiary / group companies). In case, bidder is a subsidiary of a holding company, financial position criteria referred to in clause 1.2 above shall be that of subsidiary company only (i.e. excluding its holding company).
SECTION

SECTION FORMS & PROCEDURES

DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)

VOLUME – I
CONDITIONS OF CONTRACT
1. BID FORM

Please Refer Volume III
2. BID SECURITY FORM

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

INV No.: .........

Name of Contract:......................

To: (Name and Address of Employer)

WHEREAS .................(name of Bidder) (hereinafter called "the Bidder") has submitted its Bid dated ......................(date of bid) for the performance of the above-named Contract (hereinafter called "the Bid")

KNOW ALL PERSONS by these present that WE......................(name of bank) of.............. (address of bank) (hereinafter called "the Bank"), are bound unto......................(name of Employer) (hereinafter called "the Employer") in the sum of: ....................... for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents.

Sealed with the Common Seal of the said Bank this ...........day of .......... 20 .......

THE CONDITIONS of this obligation are:

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

(2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid; or

(3) If the bidder does not accept the correction of its Bid Price pursuant to INB Sub Clause 34.2 or

(4) If, as per the Qualifying Requirements the Bidder has to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/ High Commission in that country, before opening of price bid; or

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

   (i) to sign the Contract Agreement, in accordance with INB Clause 42, or

   (ii) to furnish the required performance security, in accordance with INB Clause 43.

WE undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it, owing to the occurrence of any of the above-named CONDITIONS or their combination, and specifying the occurred condition or conditions.

This guarantee will remain in full force up to and including (the date 45 days after the period of bid validity), and any demand in respect thereof must reach the Bank not later than the above date.
For and on behalf of the Bank

……………………..
(Signature)

in the capacity of

……………………………

Common Seal of the Bank______________________

Name & Designation of issuing Person

POA Number_______________________
Contact Number(s): Tel._____________ Mobile________________
Fax Number_______________________
Domain email ____________________________

Address of issuing branch.

Note: In case the bid is submitted by a Joint venture/ Consortium, the bid security shall be in the name of the Joint venture/ Consortium and not in the name of the Lead Partner or any other Partner(s) of the Joint venture/ Consortium.
M/s................

Ref.: Your proposal against our INV No………………………………………………

Forfeiture of Bid Guarantee amount.

Dear Sirs,

Whereas you have furnished as a part of your proposal the Bid Guarantee in the form of irrevocable and confirmed Letter of Credit No..........................................................dated.................. opened by .................................................Name of the Employer) on demand without any reservation, demur or protest, contest and recourse at..............................(Name and place of Bank).

In terms of the aforesaid Bid Guarantee, we do hereby forfeit the Guarantee amount.

For.................. (Name of the Employer)

(AUTHORISED SIGNATORY)

N.B. The Letter of Credit should not stipulate any other proforma of notification different from this format. No change whatsoever in the said proforma is acceptable to the Employer.
3b. FORM OF SIGHT DRAFT

Drawn under L.C.
No.......................................................dated......................................................of......................................................
...........................................................................................................................................................................
(Name of Bank that opened the L.C.)

At sight promptly pay to..................................................................................................................................
(Name of the Bank at which L.C. is negotiable)
or order sum of.................................................................................................................................................
(Amount of L.C.)
(for payment to the Employer) for value received.

For...................(Name of the Employer)

(AUTHORISED SIGNATORY)

To,

(Name and Address of the Bank which opened L.C.)
4a. FORM OF NOTIFICATION OF AWARD OF CONTRACT' FOR
SUPPLY OF PLANT AND EQUIPMENT

NOTE: INSTRUCTIONS INDICATED IN ITALICS IN THIS NOTIFICATION OF AWARD ARE TO BE TAKEN CARE OF BY THE ISSUING AUTHORITY.

Ref. No. :
Date :
…..(Contractor's Name & Address)…..

Attn : Mr.............

Sub: Notification of Award of Contract for Supply of………………………………….(Package Name) …………………as per Specification No…………………

Dear Sir,

1.0 This has reference to the following:

(i) Our Invitation for Bids (INV) No. ………………………………….. dated ……………

(ii) Bidding Documents for the subject package issued to you vide our letter no. ………… dated……………………………..comprising the following :

………………….. (List out all the Sections/Volumes of the Bidding Documents along with Tender Drawings etc. as issued to the bidder) …………………………………

Errata/Amendment No…………………… to……………………. (Name of Section/Volume of the Bidding Documents to which Errata/Amendment pertains)………………….. issued to you vide our letter no………………….. dated……………………………..

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

(iii) Clarifications furnished to you on the Bidding Documents vide our letter no…………………..dated ………based on the query raised by you/one of the prospective bidders. (Use as applicable)

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

(iv) Your Proposal for the subject package submitted vide your letter No. ………………………………….. dated………………………..and its modification vide letter no…………………..dated ……………

(Delete if not applicable).


(Applicable only if any extension has been sought subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO
OR BY THE BIDDER AFTER BID OPENING)

(vi) Our Fax message/letter No……………………………dated………………………………….. inviting you for post bid discussions.

(vii) Post bid discussions and meetings we had with you from…………………………to ………………………… resulting into the following Minutes of Meeting enclosed herein with this Notification of award:

(a) Minutes of Meeting regarding Commercial issues (APPENDIX - ....)
(b) Minutes of Meeting on Technical issues (APPENDIX - ....)
(c) Minutes of Meeting regarding Work Schedule (APPENDIX - ....)
(d) Minutes of Meeting regarding Quality Assurance Aspects (APPENDIX- ……)

2.0 We confirm having accepted your proposal submitted vide letter no. ………………. dated ……………… and its modification vide letter no……………..dated (Delete if not applicable) read in conjunction with all the specifications, terms & conditions of the Bidding Documents, Your subsequent letters (Use if relevant) and agreed Minutes of Meeting referred to in para 1.0 above and award on you the Contract for the work of ………………………………..(Indicate brief Scope of Work)……………………………………………………………………..of ………………………………..(Name of Package) ……………………………….. for ……………………..(Name of project) ……………………..as per Specification No. : ……………………..(hereinafter referred to as the 'First Contract').

3.0 We have also notified you vide our Notification of Award No…………………. dated ………………… for award of another Contract on you for the work of …………………….. (Indicate brief scope of work of the Second Contract) ……………………. of the equipment/materials to be supplied by you under this 'First Contract' including Performance and Guarantee test for complete ……………………..(Name of Package)………………….. for ……………………..(Name of Project)………………….. as per Specification No…………………..(hereinafter referred to as the 'Second Contract').

You shall also be fully responsible for the works to be executed under the 'Second Contract' and it is expressly understood and agreed by you that any breach under the 'Second Contract' shall automatically be deemed as a breach of this 'First Contract' and vice-versa and any such breach or occurrence or default giving us a right to terminate the 'Second Contract' and/or recover damages thereunder, shall give us an absolute right to terminate this Contract and/or recover damages under this 'First Contract' as well and vice-versa. However, such breach or default or occurrence in the 'Second Contract' shall not automatically relieve you of any of your responsibility/obligations under this 'First Contract'. It is also expressly understood and agreed by you that the equipment/materials to be supplied by you under this 'First Contract' when installed and commissioned under the 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

4.0 The total Contract Price for the entire scope of work under the Contract shall be ……..(Specify the amount and currency)………………………………. as per the following break up:

(i) Ex-manufacturing works/place ……………………………………………
    of dispatch price (both in India)/ CIF/CIP port of entry price
    (Use as Applicable)
    for Main Equipment

(ii) Ex-manufacturing works/place ……………………………………………
    of dispatch price (both in India)/ CIF/CIP port of entry price
    (Use as Applicable)
for Mandatory Spares

(iii) Type test charges .................................................................
     (Delete if not applicable)

TOTAL (i + ii + iii)

(................. (Specify the total amount in words)......................)

5.0 You shall prepare and finalize the Contract Documents for signing of the formal Contract Agreement and shall enter into the Contract Agreement with us, as per the proforma enclosed with the Bidding Documents, on non-judicial stamp paper of appropriate value within.............(Specify)............days from the date of this Notification of Award.

6.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorized signatory of your company as a proof of your acknowledgement and confirmation.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,
for and on behalf of

..(Name of the Employer)...

(Authorised Signatory)

Encl. : As above.
4b. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR INSTALLATION OF PLANT AND EQUIPMENT

NOTE: INSTRUCTIONS INDICATED IN ITALICS IN THIS NOTIFICATION OF AWARD ARE TO BE TAKEN CARE OF BY THE ISSUING AUTHORITY.

Ref. No. :
Date :

...(Contractor's Name & Address)...

Attn: Mr. .................

Sub: Notification of Award of Contract for Installation, testing and commissioning of ............ (Package Name) ............... as per Specification No. ....................

Dear Sir,

1.0 This has reference to the following:

(i) Our Invitation for Bids (INV) No. ......................... dated ....................

(ii) Bidding Documents for the subject package issued to you vide our letter no. ............ dated........................... comprising the following:

.................................(List out all the Sections/Volumes of the Bidding Documents along with Tender Drawings etc. as issued to the bidder).................................................................. Errata/Amendment No............. to...................... (Name of Section/Volume of the Bidding Documents to which Errata/Amendment pertains) ............issued to you vide our letter no. ............ dated...................

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

(iii) Clarifications furnished to you on the Bidding Documents vide our letter no........... dated ................. based on the query raised by you/one of the prospective bidders (Use as applicable).

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

(iv) Your Proposal for the subject package submitted vide your letter No. ............ dated.............. and its modification vide letter no. ..................................dated.............. (Delete if not applicable).


(Applicable only if any extension has been sought subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO OR BY THE BIDDER AFTER BID OPENING)

(vi) Our Fax message/letter no. ................. Dated ................... inviting you for post bid discussions.
Section: IV – Forms and Procedure (F&P)  

2.0 We confirm having accepted your proposal submitted vide letter no. ..................dated..................and its modification vide letter no. .................. dated .................. (Delete if not applicable) read in conjunction with all the specifications, terms & conditions of the Bidding Documents, Your subsequent letters (Use if relevant) and agreed Minutes of Meeting referred to in para 1.0 above and award on you the Contract for the work of ............. (Indicate brief Scope of Work) .................. of .................. (Name of Package) .................. for .................. (Name of Project) .................. as per Specification No.: .................. (hereinafter referred to as the 'Second Contract').

3.0 We have also notified you vide our Notification of Award No. .................. dated .................. for award of another Contract on you for the work of .................. (Indicate brief scope of work of the First Contract) .................. of the equipment/ materials to be supplied by you under the 'First Contract' including Performance and Guarantee Test for complete .................. (Name of Package) .................. for .................. (Name of Project) .................. as per Specification No. .................. (hereinafter referred to as the 'First Contract'). You shall also be fully responsible for the works to be executed under the 'First Contract' and it is expressly understood and agreed by you that any breach under the 'First Contract' shall automatically be deemed as a breach of this 'Second Contract' and vice-versa and any such breach or occurrence or default giving us a right to terminate the 'First Contract' and/or recover damages there-under, shall give us an absolute right to terminate this Contract and/or recover damages under this 'Second Contract' as well and vice-versa. However, such breach or default or occurrence in the 'First Contract' shall not automatically relieve you of any of your responsibility/obligations under this 'Second Contract'. It is also expressly understood and agreed by you that the equipment/materials to be supplied by you under the 'First Contract' when erected and commissioned under this 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

4.0 The total Contract Price for the entire scope of work under the Contract shall be .................. (Specify the amount and currency) .......... as per the following break up:

(i) Inland transportation and inland transit insurance charges including port clearance, port handling and port charges (Delete if not applicable) for Main Equipment:

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

(ii) Inland transportation and inland transit insurance charges including port clearance, port handling and port charges (Delete if not applicable) for Mandatory Spares:

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

(iii) Unloading and handling at site, storage, erection, testing and commissioning including performance testing and insurance covering all the activities:

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

TOTAL (i + ii + iii)

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

(Specify the total amount in words)
5.0 You shall prepare and finalize the Contract Documents for signing of the formal Contract Agreement and shall enter into the Contract Agreement with us, as per the proforma enclosed with the Bidding Documents, on non-judicial stamp paper of appropriate value within …………….. ... (Specify)……… …days from the date of this Notification of Award.

6.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorized signatory of your company as a proof of your acknowledgement and confirmation.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,
for and on behalf of

..(Name of the Employer)...

(Authorised Signatory)
5. FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT is made the ……………............... day of ............, 20………..

BETWEEN

(1) ........................................................................a corporation incorporated under the laws
(Name of Employer)
of .................................................................................and having its principal place of business
(law of country of Employer)
at ............................................................ (Address of Employer) (hereinafter called "the Employer")

and

(2) ..........................................................., a corporation incorporated under the laws of
(Name of Contractor)
…………………………………………….. and having its principal place of business
(Country of Contractor)
at ………………………………..… (Address of Contractor) (hereinafter called "the Contractor")

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install,
complete and commission certain Facilities, viz.

……………………………………………………………………….. ("the Facilities") and the
(List of Facilities)

Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter
appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference CC Clause 2)

The following documents shall constitute the Contract between the Employer and the Contractor,
and each shall be read and construed as an integral part of the Contract:

(1) This Contract Agreement and the Appendices hereto

(2) Notification of Award.

(3) Conditions of Contract

(4) Technical Specifications and Drawings

(5) The Bid and Price Schedules submitted by the Contractor

(6) Procedures (as listed)

(7) Any other documents shall be added here

1.2 Order of Precedence (Reference CC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order
of precedence shall be the order in which the Contract Documents are listed in Article 1.1
1.3 Definitions (Reference CC Clause 1)

1.3.1 Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference CC Clause 11)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of:

<table>
<thead>
<tr>
<th>Amount in Words</th>
<th>Amount in Figures in INR</th>
</tr>
</thead>
<tbody>
<tr>
<td>(..................)</td>
<td>(..................)</td>
</tr>
</tbody>
</table>

or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment (Reference CC Clause 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference CC Clause 1)

The Time of Completion of Facilities shall be determined from the date of the Notification of Award provided all of the following conditions have been fulfilled within a period of two (2) months from the date of said Notification of Award:

(a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor;

(b) The Contractor has submitted to the Employer the Performance Security and the Advance Payment Guarantee;

(c) The Employer has paid the Contractor the Advance Payment.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the Conditions listed under 3.1 are not fulfilled within two (2) months from date of Notification of Award because of reasons attributable to the Employer, the contract would become effective only from the date of fulfillment of the above conditions and, the parties shall discuss and agree on an equitable adjustment to the Contract Price and the time for completion and/or other relevant conditions of the Contract. The Contractor shall not however, benefit (in reckoning the Time for Completion) on account of its delay in providing the Performance Security or the Bank Guarantee
for advance payment beyond the period provided in the Contract.

**Article 4.** It is expressly understood and agreed by and between the Contractor and the Employer that the Employer is entering into this Agreement solely on its own behalf and not on behalf of any other person or entity. In particular it is expressly understood and agreed that the Government of India (GoI) is not a party to this Agreement and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that the Employer is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable laws of India and the general principals of Contract Law.

The Contractor expressly agrees, acknowledges and understands that the Employer is not an Agent, Representative or Delegate of the GoI. It is further understood and agreed that the GoI is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the Contract. Accordingly, the Contractor expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the GoI arising out of this Contract and covenants not to sue the GoI as to any manner, claim, cause of action or thing whatsoever arising of or under this Agreement.

**Article 5. Appendices**

The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

**Article 6. Deleted**

**Article 7.** Notwithstanding the award of contract under two separate contracts, any breach under one contract shall be deemed to be a breach of the other contract(s).

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and Signed by for and
on behalf of the Employer on behalf of the Contractor

Signature Signature

Title Title

in the presence of in the presence of

CONTRACT AGREEMENT

dated the ................................................. day of .......................... 20....

BETWEEN

("the Employer")

and
("the Contractor")

(Separate Contract Agreements shall be executed by the Employer and the Contractor in accordance with the Construction of the Contract stipulated at clause 44 of CC. The forms of Contract would be similar except for necessary changes required to suit the individual Contracts).

APPENDICES

Appendix 1 Terms and Procedures of Payment
Appendix 2 Price Adjustment
Appendix 3 Insurance Requirements
Appendix 4 Time Schedule
Appendix 5 List of Approved Subcontractors
Appendix 6 Scope of Works and Supply by the Employer
Appendix 7 List of Document for Approval or Review
Appendix 8 Functional Guarantees
Appendix 9 Integrity Pact (to be appended at the Stage of Contract Award.)
1.0 TERMS AND PROCEDURES OF PAYMENT

The payment to the Contractor under the Contract will be made by the Owner in line with Clause 32.0, Section-GCC, Conditions of Contract, Volume-I of the Bidding Documents and as per the guidelines and conditions specified hereunder, on the basis of the Price Break-up given in the section on price schedules. Payments will be made in Indian currency i.e. INR. The Contractor may make applications for payment in respect of part deliveries as work proceeds.

In addition to the Conditions stipulated under Clause 12.0, Section-CC, Conditions of Contract, the following terms & Conditions will apply.

All payments made during the Contract will be on account payment only.

1.1 Supply Portion

a) Advance Payment

10% (Ten percent) of the Ex-works price component (inclusive of mandatory spares) of the Contract price shall be paid as "interest bearing advance after signing the Contract Agreement and on submission of:

i) Unconditional acknowledgement of LOA by the contractor
ii) Contractor’s detailed invoice
iii) Unconditional and irrevocable Advance Bank Guarantee** for 110% of the advance amount
iv) Performance Security
v) Detailed BAR CHART and its approval by DTL
vi) Execution of Contract Agreement.

Note:

*This payment is an optional payment. The Contractor has the option of taking the interest bearing initial advance or otherwise. In case, the Contractor opts for this interest bearing initial advance, the same shall be paid to the Contractor on fulfillment of above conditions and an interest on monthly outstanding amount will be charged at the rate of SBI PLR +1% at the time of disbursement of advance. The monthly outstanding amount for the purpose of calculating the interest shall be worked out at the end of each calendar month considering proportionate adjustment of advance against dispatch payment. In case, the Contractor opts not to take interest bearing advance as above, it would be mandatory for him to submit the documents listed at S. No.(i), (iv) and (v) and (vi) above within thirty (30)days of issuance of LOA.

**The bank guarantee(s) for advance shall be kept valid till 90 days after issuance of Operational Acceptance Certificate. Recovery of the advance amount shall be made from each running bill proportionately.
b) **Progressive Payment**

(i) Subject to any deduction which the owner may be authorized to make under the contract, the contractor shall unless otherwise agreed be entitled to payment term of 55% (Fifty Five Percent)^ of the Ex-works price of equipment/materials (including all accessories and spares, if any) which shall be claimed after receipt and verification of equipment/materials at DTL site and presentation of following documents:

   a) Contractor’s detailed invoice & packing list identifying contents of each consignment.
   b) Manufacturer’s/Contractor’s guarantee certificate of quality.
   c) Insurance Policy.
   d) Material Inspection Clearance Certificate (MICC) for dispatch.
   e) Test Certificate.
   f) Material Receipt Certificate (MRC) issued by DTL at site.
   g) Equipment/materials verification report duly signed by DTL site incharge.

   ^ In case, the Contractor opts not to take interest bearing initial advance then this payment shall be 65% instead of 55%.

(ii) Further Twenty percent (20%) of the Ex-works price component (inclusive of mandatory spares) shall be paid progressively after successful erection of the equipments/materials at site and duly verified by site incharge of Employer.

c) **Final Payment**

The final Fifteen percent (15%) of the Ex-Works price component (inclusive of mandatory spares) of the equipment shall be paid on final issuance of Operational Acceptance Certificate after successful completion of erection, testing and commissioning, proof of submission of the required no. of reproducible, O&M manuals, approved drawings, data sheets, test reports, pamphlets and manual of spares, maintenance & testing equipment etc.

10.2 **DELETED**

10.3 **TRANSPORTATION & INSURANCE CHARGES**

Hundred Percent (100%) of transportation and insurance charges shall be paid to the Contractor pro-rata to the value of the equipment received at site and on production of invoices by the Contractor. The aggregate of all such pro-rata payments shall, however, not exceed the total amount quoted by the bidder in his proposal and incorporated in the Contract.

10.4 **ERECCTION PRICE COMPONENT (INCLUDING CHARGES FOR CIVIL WORKS)**

**Advance**

Ten Percent (10%) of the total Contract Price for services viz. installation (including civil works) component except transportation & insurance shall be paid as *interest bearing initial advance on establishment of Contractor’s Site office and submission of a bank guarantee* of 110% of the advance amount valid till 90 days after issuance of Operational Acceptance Certificate.

*This payment is an optional payment. The Contractor has the option of taking the interest bearing advance or otherwise.

In case, the Contractor opts for this interest bearing advance, the same shall be paid to the
Contractor on fulfillment of above conditions and an interest on monthly outstanding amount will be charged at the rate of SBI PLR +1% at the time of disbursement of advance. The monthly outstanding amount for the purpose of calculating the interest shall be worked out at the end of each calendar month against the progressive payment for the work done.

In case, the Contractor opts not to take interest bearing advance as above, it would be mandatory for him to submit the documents listed at S. No.(i), (iv),(v) and (vi) of 10.1(a) above within thirty (30)days of issuance of LOA.

(b) Progressive Payment

i) Seventy Percent (70%) of the total installation (including civil works) component of the Contract price (In case the contractor opts not to take interest bearing advance as above) or Sixty percent (60%) of the total installation (including civil works) component of the Contract price (In case the contractor opts to take interest bearing advance as above) shall be paid on certification by employer representative for the successful completion of installation services based on milestone.

ii) The further fifteen percent (15%) payment shall be paid after successful testing & commissioning.

(c) Final Payment

The balance Fifteen Percent (15%) of the total installation (including civil works) price components of contracts price shall be paid on final issuance of Operational Acceptance Certificate after successful completion of erection, testing and commissioning, proof of submission of the required no. of reproducible, O&M manuals, approved drawings, data sheets, test reports, pamphlets and manual of spares, maintenance & testing equipment etc.

10.5 Deleted

10.6 “Commissioning” for the purpose of payments shall mean satisfactory completion of all supplies, erection, inspection, commissioning checks and successful completion of all site tests and continuous energisation of the equipment/ materials at rated voltage at site as per the Contract and to the satisfaction/approval of DTL. The contractor will clear the sites and the balance materials, if any, will be shifted to proper place as per instruction of the Site Engineer. The necessary “No Dues Certificates” for electricity and water will required to be submitted, if any, from local agency(s)/ authority(s).

10.7 GOODS AND SERVICE TAX

10.7.1 Prices are to be quoted exclusive of GST and GST rate may also be indicated in the price bid and BOQ/ un-priced schedule.

10.7.2 The Contractor shall be entirely responsible for payment of all taxes, duties, licence fees and other such levies legally payable/incurred until delivery of the contracted supplies to the Employer. If it is statutory requirement to make deductions towards such taxes and duties or any other applicable taxes and duties, the same shall be made by the owner and a certificate for the same shall be issued to the Contractor.

10.7.3 The Contractor shall be solely responsible for its Income Tax liabilities and for taxes that may be levied on the Contractor’s persons or on earnings of any of his employees and shall hold the owner indemnified and harmless against any claims that may be made against the Employer. The Employer does not take any responsibility whatsoever regarding taxes under Income Tax Act, for the Contractor or his personnel. If it is obligatory under the provisions of the Income Tax Act,
deduction of Income Tax at source shall be made by the Employer.

10.7.4 In respect of transactions between the Employer and the Contractor, the Base Price is inclusive of all cost as well as duties and tax (custom duties & levies, Taxes and duties as per GST Rules) paid or payable on components, raw materials and any other items used /incorporated or to be incorporated in the Plants & Equipments and other final goods & services to be supplied by the contractor under the proposed contract. No separate claim shall be paid by the Employer for taxes and duties included in respect of these items stated herein.

10.7.5 Taxes, duties and levies as per GST Rules for the goods & Services under ‘transactions’ between contractor & Employer for destination site/state shall not be included in the base price. These amounts will be payable (along with subsequent statutory variation if any) on the supplies made by the Contractor, subject to submission of the documentary evidence indicating the said taxes paid by the contractor and GST credit is transferred to the Employer. But the amount of said taxes shall be limited to the tax liability on the transaction between the employer and the Contractor only. However, Employer will not bear any upward variation in GST rate due to change/disputes in classification relating to HSN/SAC code as quoted by the bidder at a later stage. Employer shall, however, deduct such taxes at source as per the rules and issue Tax Deduction at Source (TDS) Certificate to the Contractor as per the said rules.

The Input Tax Credit (ITC) available, if any, under GST as per the relevant Government laws wherever applicable has been taken into account by the Contractor. Reimbursement of GST by the Employer shall be at the rate applicable on the HSN/SAC of the goods/services supplied by the Contractor to the Employer as mutually agreed upon. The payment of GST on advance payment shall be against Invoice/Debit Note containing particulars specified under the GST Act and related Rules, Notifications, etc as notified by the Government in this regard. In the event that the Contractor fails to provide the invoice in the form and manner prescribed under the GST Act and Rules, the Employer shall not be liable to make any payment against such invoice. GST payment against Advance payment shall be against a proforma invoice. Further, the Contractor shall, within 7 days from the date of receipt of Advance, furnish an Advance Receipt Voucher to the Employer, as prescribed under the GST Law.

10.7.6 The Contractor shall comply with all tax laws in force in India. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, interest, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such tax laws by the Contractor or its personnel, including the Subcontractors and their personnel.

10.7.7 DELETED

10.7.8 For payment in respect of dispatches made directly from Contractor's works, Tax invoices raised by the Contractor shall be accepted as documentary evidence and for payment of GST. The amount of GST as stated in Tax invoice will be paid only after the GST credit is transferred to the Employer.

However, the employer from time to time may also verify the payment / deposit of various taxes by the contractor, which the later has already claimed and charged in the previous invoices from the employer against the aforesaid transactions between employer and the contractor.

10.7.9 In Case the Taxes, Duties and Levies as per GST Rules on transaction between Employer and the Contractor is covered under the Reverse Charge provision full Tax has to be stated / mentioned in the quoted prices/bid. However, where the Reverse Charge Mechanism Provisions are applicable, DTL shall not pay the applicable tax amount to the contractor and will deposit directly to the Government treasury.
To facilitate the bidders, Employer has indicated HSN/SAC code and rate of GST against each item in the price schedule. It shall entirely be the responsibility of the bidder to check the HSN/SAC code and rate of GST given against each item. The bidder may either confirm the HSN and rate of GST or if the bidder opts to classify the item in question under a different HSN/SAC code or opts to indicate a different rate of GST, bidder may indicate the same in the columns provided. The bidder shall solely be responsible for HSN/SAC classification and the rate of GST of each item. Employer’s liability for the reimbursement of GST shall be GST applicable at the rate as confirmed/deemed confirmed in the bid and as accepted by the employer.

The Input Tax Credit (ITC) available, if any, under the GST law as per the relevant Govt. policies wherever applicable shall be taken into account by the bidder while quoting bid price.

10.7.10 For the purpose of the Contract, it is agreed that the Contract Price specified in Article-2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes inclusive of duties, levies and charges prevailing at the date seven (07) days prior to the last date of bid submission. If any rates of Tax including service tax are increased or decreased or, a new Tax is introduced, or/an existing Tax is abolished in the course of the performance of the Contract, which was or will be assessed on the Contractor in connection with performance of the Contract, an equitable adjustment of the Contract price shall be made to take into account any such change by addition to the Contract price or deduction therefrom, as the case may be (changes in law & regulations) hereof. However, these adjustments would be applicable to all transactions between the employer and the Contractor for which the taxes and duties are reimbursable by the Employer as per the Contract. These adjustments shall not be applicable on procurement of raw materials, intermediary components etc by the Contractor. 10.7.11 In respect of raw materials, intermediary components etc forming part of base price of goods & services supplied under the contract, neither the employer nor the Contractor shall be entitled to any claim arising due to increase or decrease in the rate of Tax, introduction of a new Tax or abolition of an existing Tax in the course of the performance of the Contract. However, Employer will not bear any upward variation in GST rate due to change/disputes in classification relating to HSN/SAC code as quoted by the bidder at a later stage.

10.8 MODE OF PAYMENT

Payments shall be made by DTL within Thirty (30) days of receipt of Complete GST compliance tax invoices and supported by the requisite documents and fulfillment of stipulated conditions, if any. All the payment shall be released to the Contractor directly through ECS. For this the contractor shall have to provide their Bank Account No., Bank Name, RTGS / MICR / IFSC and other details to our AM(F)SB / AM(F)Works, IIInd Floor, pre-fabricated building, Rajghat Power House, New Delhi - 110002.

Payment of GST component shall be made only if vendor deposited the GST and the credit for the same reflected in the form GSTR3 (Monthly Return) of the GST network and in case of dis-allowance of credit in GSTR3, the amount shall be recovered from vendor with the penalty as per the provision stipulated in GST Act/Law.
APPENDIX 2

PRICE ADJUSTMENT

The prices are to remain FIRM and FIXED for the duration of the Contract.
INSURANCE REQUIREMENTS

Insurances to be taken out by the Contractor

In accordance with the provisions of CC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

(a) Cargo Insurance

Covering loss or damage occurring, whilst in transit from the Contractor's or manufacturer's works or stores until arrival at the Site, to the Facilities (including spare parts therefore) and to the Construction Equipment to be provided by the Contractor or its Subcontractors.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties Insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>165% of the (CIF NIL Contractor &amp; Warehouse Employer)</td>
<td>Warehouse + 60 days</td>
<td>Contractor &amp; Employer</td>
<td>Warehouse</td>
<td>+ 60 days</td>
</tr>
</tbody>
</table>

(b) Installation All Risks Insurance

Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties Insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>165% of the (Contract Price) NIL Contractor/ Sub-contractor &amp; Employer</td>
<td>Receipt at site Upto Defect Liability period</td>
<td>Contractor/ Sub-contractor &amp; Employer</td>
<td>Commencement of work</td>
<td>Up to Defect Liability period</td>
</tr>
</tbody>
</table>

(c) Third Party Liability Insurance

Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties Insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs. 0.5 million per person NIL Contractor/ Sub-contractor</td>
<td>Commencement of work Up to Defect Liability period</td>
<td>Contractor/ Sub-contractor</td>
<td>Commencement of work</td>
<td>Up to Defect Liability period</td>
</tr>
<tr>
<td>per occasion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(d) Automobile Liability Insurance

Covering use of all vehicles used by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities. Comprehensive insurance in
accordance with statutory requirements.

(e) **Worker's Compensation**

in accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(f) **Employer's Liability**

in accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed.

(g) **Other Insurances**

The Contractor is also required to take out and maintain at its own cost the following insurances:

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties Insured</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIL</td>
<td></td>
<td>Contractor/ Receipt</td>
<td>Upto Defect</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-contractor at site</td>
<td>Liability</td>
<td>period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&amp; Employer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub-Clause 34.1 above except for the Third Party Liability, Worker's Compensation and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to CC Sub Clause 34.1 above except for the Cargo, Worker's Compensation and Employer's Liability Insurances, and all insurer's rights of subrogation against such co-insured for losses or claims arising out of the performance of the Contract shall be waived under such policies.

**Insurances to be taken out by the Employer**

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Details:....

<table>
<thead>
<tr>
<th>Amount</th>
<th>Deductible limits</th>
<th>Parties Insured</th>
<th>From</th>
<th>To</th>
</tr>
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<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

----------------- NIL-----------------------------
### TIME SCHEDULE

1. The Project Completion Schedule shall be as follows:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Activities</th>
<th>Duration in months from the date of Notification of Award</th>
<th>Completion of Delivery at site</th>
<th>Completion of Erection &amp; Commissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I)</td>
<td>Transformer Pkg.:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Najafgarh S/S</td>
<td>9 months</td>
<td>12 months</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>1x160MVA, 220/66/11kV, 3-Ph, Transformers at Kanjhawala S/S</td>
<td>9 months</td>
<td>12 months</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Gopalpur GIS S/S</td>
<td>11 months</td>
<td>14 months</td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Budella GIS S/S</td>
<td>13 months</td>
<td>16 months</td>
<td></td>
</tr>
<tr>
<td>e)</td>
<td>2x160MVA, 220/66/11kV, 3-Ph, Transformers at Sanjay Gandhi Transport Nagar GIS S/S</td>
<td>13 months</td>
<td>16 months</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The delivery schedule has been envisaged by the employer to accommodate the facilities as per specific site requirement. However, for the purpose of LD, final commissioning date as per schedule specified in the CC for respective facility shall be the benchmark.

1.1 The bidder shall include in his proposal his programme for furnishing and installation of the equipment including related civil work covered under this package. The programme shall be in the form of a master network plan (MNW) and shall identify the various activities like design, engineering, manufacturing, supply, installation, factory testing, transportation to site, site testing and commissioning, guarantee test and operational acceptance, etc., of the entire project work. The network plan shall confirm to the above completion schedule. No credit will be given for earlier completion.

This master network will be discussed and agreed before Award in line with above, engineering drawing and data submission schedule shall also be discussed and finalized before Award. Liquidated damages for delay in successful completion of taking over at rates specified in Clause 26.2 of CC shall be applicable beyond the date specified above.

1.2 The employer reserves the right to request minor changes in the work schedule at the time of Award of Contracts to the successful Bidder.

1.3 The successful Bidder shall be required to prepare detailed Network(s) and project implementation plans & programs and finalize the same with the Employer as per the requirement specified in Technical Specifications, which shall form a part of the Contract.
LIST OF APPROVED SUBCONTRACTORS

Prior to award of Contract, the following details shall be completed indicating those sub-contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with CC Sub-Clause 19.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

<table>
<thead>
<tr>
<th>Item of Facilities</th>
<th>Approved Subcontractors</th>
<th>Nationality</th>
</tr>
</thead>
</table>
SCOPE OF WORKS AND SUPPLY BY THE EMPLOYER

The following personnel, facilities, works and supplies will be provided/ supplied by the Employer, and the provisions of CC 10, 20, 21 and 24 as well as Employer responsibilities stated in technical specifications shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor in accordance with the approved Time Schedule and Program of Performance pursuant to CC Sub-Clause 18.2.

Unless otherwise indicated, all personnel, facilities, works and supplies will be provided free of charge to the Contractor.

**Personnel**  
Charge to Contractor - None

NIL

**Facilities**  
Charge to Contractor - None except as noted

1. Permission will be arranged by the Employer for full site and facilities access as required for site surveys and for the installation, connection and testing of complete equipment and systems. Such permission shall be requested by the Contractor one month prior to the Scheduled need for such access, consistent with the Contractors "Project Implementation Plan", Subsequent to approval of such "Plan" by Employer.

**Electricity and Water**  
Charge to Contractor - as noted

The Contractor shall be entitled to use for the purposes of the facilities such supplies of electricity and water as may be available on the Site and shall provide any apparatus necessary for such use. The Contractor shall pay the Employer at the applicable tariff plus Employer's overheads, if any, for such use. Where such supplies are not available, the Contractor shall make his own arrangement for provision of any supplies he may require.

**Works**  
Charge to Contractor - None

NIL

**Supplies**  
Charge to Contractor - None

NIL
LIST OF DOCUMENTS FOR APPROVAL OR REVIEW

Pursuant to CC Sub-Clause 20.3.1, the Contractor shall prepare or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of CC Sub-Clause 18.2 (Program of Performance), the following documents for:

A. Approval
   1. 
   2. 
   3. 

B. Review
   1. 
   2. 
   3. 

Note:
Bidder shall furnish the exhaustive list, which shall be discussed and finalized for incorporation into the Contract Agreement.
FUNCTIONAL GUARANTEES

GUARANTEES, LIQUIDATED DAMAGES FOR NON PERFORMANCE

1. The equipment offered shall meet the rating and performance requirements stipulated in Technical Specification for various equipment or indicated in Data requirement.

2. The ratings and performance figures of power transformers furnished by us are guaranteed. We further declare that in the event of any deficiencies in meeting the guarantees in respect of the characteristics mentioned below as established after conducting the factory test, you may at your discretion, reject or accept the equipment after assessing the liquidated damages as specified in relevant clause of Bid Documents.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Guaranteed Losses at rated output (KW) per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Copper Loss @ 75° C</td>
</tr>
<tr>
<td>160MVA Power Transformer</td>
<td>@ Rs.69900/-</td>
</tr>
</tbody>
</table>

3. If the guarantees are not established at factory test in case of Power Transformer then the Employer at his discretion may reject or accept the equipment after assessing the liquidated damages as per table below against the Contract and such amounts shall be deducted from the Contract Price or otherwise recovered from the Contractor.

4. In case of Power Transformer, the measured loss for equipment shall be corrected in accordance with IEC-289 & IEC-76 for the purpose of comparison of guaranteed losses with measured losses for levy of liquidated damages. However, the equipment under no circumstances shall be accepted if the measured losses are more than +15 percent of the guaranteed losses at rated voltage quoted by the bidders.

5. The factors and the respective Indian Rupees Value per unit of differential loss over and above the guaranteed for the purpose of calculation of liquated damages for non-performances shall be as stipulated below:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Parameter to be taken for applying differential price Factor (F)</th>
<th>Value of F on Indian Rupees per unit of parameter Differential per KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Transformer</td>
<td>Differential Copper Loss (KW)</td>
<td>Rs. 69900/-</td>
</tr>
<tr>
<td></td>
<td>Differential Iron Loss (KW)</td>
<td>Rs. 171300/-</td>
</tr>
<tr>
<td></td>
<td>Differential Cooler Loss (KW)</td>
<td>Rs. 68500/-</td>
</tr>
</tbody>
</table>
6. PERFORMANCE SECURITY FORM  
(For Bidder)  
Bank Guarantee – Unconditional

Bank Guarantee No.…………………… Date……………. 

Contract No.………………….
…………..…………………[Name of Contract]………………

To: [Name and address of the Employer] 

Dear Ladies and / or Gentlemen,

We refer to the Contract (“the Contract”) signed on……………………………………… (insert date of contract).……………… between DELHI TRANSCO LIMITED and M/s.…………………………..…………………. (insert name of contractor)………., a Company incorporated under …………………………….. having its Registered Office at ………………………………………. (hereinafter referred to as "the Contractor"), concerning ……………………… (insert brief scope of work) for the complete execution of the ………………… (insert name of the package along with name of the Project).

By this letter we, the undersigned, ……………… (insert address of issuing bank) ……………..…………………a Bank (or Company) organized under the laws of …………………………..and having its registered/ Head office at ………………………………………(insert address of registered office of the bank) ………………………………………do hereby jointly and Severally with the Contractor Price irrevocably guarantee payment to you up to ten percent(10%) of the Contract Price including all taxes and duties until sixty (60) days beyond the Defect Liability Period.

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall be valid from the date of issue until sixty (60) days beyond the Defect Liability Period of the Facilities i.e. up to and inclusive of …………………(year, month and date.)

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

If the Defect Liability Period is extended with respect to any part of the Facilities in accordance with the Contract, the validity of this letter or Guarantee shall be extended with respect to ten percent (10%) of the Contract Price including all taxes and duties of that part until expiry of 60 days beyond such extended Defect Liability Period.

Our liability under this letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notice to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be in increased or deceased.
No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]
Signature_______________________
Name_______________________
Designation_______________________
POA Number_______________________
Contact Number(s): Tel.______________ Mobile______________
Fax Number_______________________
email ____________________________
Common Seal of the Bank______________________
Witness:
Signature_______________________
Name_______________________
Address______________________________
Contact Number(s): Tel.______________ Mobile______________
email ____________________________

Note:

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.

2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

3. Performance Security is to be provided by the successful bidder in the form of a bank guarantee which should be issued either:

   (a) by a reputed bank located in the country of Employer and acceptable to the Employer, or

   (b) by a foreign bank confirmed by either its correspondent bank located in the country of Employer which should be reputed and acceptable to the Employer, or

   (c) by a Public Sector Bank in the country of Employer.

All banks shall be nationalized and scheduled banks operating in India.
6A. PERFORMANCE SECURITY FORM
(Form For bidder in case of Collaborator/Parent Company/Principals)

Bank Guarantee – Unconditional

Bank Guarantee No…………………… Date…………

Contract No………………………..[Name of Contract]………………

To: [Name and address of the Employer]

Dear Ladies and / or Gentlemen,

We refer to the Contract (“the Contract”) signed on……………………………. (insert date of contract)…………..…. between DELHI TRANSCO LIMITED and M/s…………………….…………………….(Name of Contractor)……….. a Company incorporated under ………………… having its Registered Office at …………………………………. (hereinafter referred to as “the Contractor”), concerning ………….. (indicate brief scope of work) for the complete execution of the ………………… (insert name of the package along with name of the Project).

Whereas, the Contractor has agreed to supply the ____@____ _ in collaboration with M/s ................. (Name of Parent Company / Collaborator / Principal) .................., having its Principal place of business at ……….... (Address of Parent Company / Collaborator / Principal) ............................... and Registered Office at ……….. ..(Registered address of Parent Company / Collaborator / Principal) ............................... (hereinafter referred to as the "Parent Company" / "Collaborator" / "Principal"), as a pre-requisite for qualification of the Bidder/Contractor and have submitted a Deed of Joint Undertaking declaring that they are jointly and severally bound and responsible for ensuring a valid technology transfer agreement including license to manufacture in India, between the Parent Company / Collaborator / Principal (the technology provider) and the Contractor for the successful performance of the said equipment in accordance with the Contract Specifications and that the Bidder/Contractor and /or manufacturer having agreed to furnish a Contract Performance Guarantee for the faithful performance/compliance of the Deed of Undertaking equivalent to (10%) ten per cent of the cost of ____@____ to be supplied by the Contractor under the Contract, in addition to Contract Performance Guarantee equivalent to 10% (ten per cent) of the value of the Contract to be provided by the Contractor for the faithful performance of the entire Contract.

By this letter we, the undersigned, ……………… (insert name and address of issuing bank) …………………….do hereby jointly and Severally with the Contractor Price irrevocably guarantee payment to you up to ……(amount) i.e. ten percent (10%) of the ………@……. price including taxes and duties until sixty (60) days beyond the Defect Liability Period.

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by your duly authorized officer declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until sixty (60) days beyond the Defect Liability Period of the said equipment i.e. upto and inclusive of ……………………………… (year, month and date).

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.
If the Defect Liability Period is extended with respect to any part of the said equipment(s) in accordance with the Contract, the validity of this letter of Guarantee shall be extended with respect to ten percent (10%) of the .........@...... price including taxes and duties of that part until expiry of 60 days beyond such extended Defect Liability Period.

Our liability under this letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notice to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

For and on behalf of the Bank

[Surname of the authorised signatory(ies)]
Signature_______________________
Name_______________________
Designation_______________________
POA Number_______________________
Contact Number(s): Tel.______________Mobile______________
Fax Number_______________________
email ____________________________
Common Seal of the Bank______________________
Witness:
Signature_______________________
Name_______________________
Address______________________________
Contact Number(s): Tel.______________Mobile______________
email ____________________________

Note:
1. The non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the ‘Bank Guarantee’.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.
3. @ Insert name of the Equipment viz., Transformer
4. This additional performance security is to be provided by the successful bidder, in the form of a bank guarantee which should be issued either:
   (a) by a reputed bank located in the country of Employer and acceptable to the Employer, or
   (b) by a foreign bank confirmed by either its correspondent bank located in the country of Employer which should be reputed and acceptable to the Employer, or
   (c) by a Public Sector Bank in the country of Employer.

   All banks shall be nationalized and scheduled banks operating in India.
7. BANK GUARANTEE FORM FOR ADVANCE PAYMENT

[Name of Contract]

To: [Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on ................................................................. between you and ............................................. ("the Contractor") concerning design, execution and completion of (Brief description of the Facilities) ..........................................................

Whereas, in accordance with the terms of the said Contract, the Employer has agreed to pay or cause to be paid to the Contractor an Advance Payment in the amount of Indian Rupees (INR) .......................(Amount in words)

..................................................................................................................(....................)

(Amount in figures in INR)

By this letter we, the undersigned, ........................................, a Bank (or company) organized under the laws of ................................................................. and having its registered/principal office at ................................................................. do hereby jointly and severally with the Contractor irrevocably guarantee repayment of the said amounts upon the first demand of the Employer without cavil or argument in the event that the Contractor fails to commence or fulfill its obligations under the terms of the said Contract, and in the event of such failure, refuses to repay all or part (as the case may be) of the said advance payment to the Employer.

Provided always that the Bank's obligation shall be limited to an amount equal to the outstanding balance of the advance payment, taking into account such amounts, which have been repaid by the Contractor from time to time in accordance with the terms of payment of the said Contract as evidenced by appropriate payment certificates.

This Guarantee shall remain in full force from the date upon which the said advance payment is received by the Contractor until the date upon which the Contractor has fully repaid the amount so advanced to the Employer in accordance with the terms of the Contract. At the time at which the outstanding amount is NIL, this Guarantee shall become null and void, whether the original is returned to us or not.

Any claims to be made under this Guarantee must be received by the Bank during its period of validity, i.e. upto 90 (ninety) days after the date of operational acceptance by the Employer i.e. on or before ....................................................(year, month, date).

Yours truly,
For and on behalf of the Bank

[Signature of the authorised signatory(ies)]
Signature __________________________
Name_______________________
Designation_______________________
POA Number_______________________
Contact Number(s): Tel.______________Mobile______________
Fax Number_______________________
email ____________________________
Common Seal of the Bank______________________
Witness:
Signature_______________________
Name_______________________
Address______________________________
Contact Number(s): Tel.______________Mobile______________
email ____________________________

Note:

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of the bank who issues the 'Bank Guarantee'.

2. Advance Bank Guarantee is to be provided by the successful bidder in the form of a bank guarantee which should be issued either:
   
   (a) by a reputed bank located in the country of Employer and acceptable to the Employer, or

   (b) by a foreign bank confirmed by either its correspondent bank located in the country of Employer which should be reputed and acceptable to the Employer, or

   (c) by a Public Sector Bank in the country of Employer.

All banks shall be nationalized and scheduled banks operating in India.
Date........................................

Name of Contract.............
Contract No....................

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to CC 24 (Completion of the Facilities) of the Conditions of the Contract entered into between yourselves and the Employer dated ........................................ relating to the ...........................................................
(Brief description of the Facilities)

we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below :

1. Description of the Facilities or part thereof ...........................................................

2. Date of Completion :.................................................................

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)
9. FORM OF OPERATIONAL ACCEPTANCE CERTIFICATE

Date……………………

Name of Contract………
Contract No………………

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to CC 25.3 (Operational Acceptance) of the Conditions of the Contract entered into between yourselves and the Employer dated………………
relating to the ………………………………………
(Brief description of the facilities)

we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof ………………………………..

2. Date of Operational Acceptance : …………………………………………..

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)
10. CHANGE ORDER PROCEDURE

Contract No. .........................

CONTENTS

1. GENERAL
2. CHANGE ORDER LOG
3. REFERENCE FOR CHANGES
4. ANNEXURES
   ANNEX 1 Request for Change Proposal
   ANNEX 2 Estimates for Change Proposal
   ANNEX 3 Acceptance of Estimates
   ANNEX 4 Change Proposal
   ANNEX 5 Change Order
   ANNEX 6 Pending Agreement Change Order
   ANNEX 7 Application for Change Proposal
   ANNEX 8 Change Order Log
CHANGE ORDER PROCEDURE

1. **General**

   This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with CC 39 (Change in Facilities) of the Conditions of Contract.

2. **Change Order Log**

   The Contractor shall keep an up-to-date change Order Log to show the current status of Requests for Change and Changes authorized or pending as Annex-8 Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

3. **References for Changes**

   (i) Request for Changes as referred to in CC Clause 39 shall be serially numbered CR-X-nnn.

   (ii) Estimate for Change Proposal as referred to in CC Clause 39 shall be serially numbered CN-X-nnn.

   (iii) Acceptance of Estimate as referred to in CC Clause 39 shall be serially Numbered CA-X-nnn.

   (iv) Change Proposal as referred to in CC Clause 39 shall be serially numbered CP-X-nnn.

   (v) Change Order as referred to in CC Clause 39 shall be serially numbered CO-X-nnn.

   **Notes :**

   (a) Requests for Change issued from the Employer’s Home Office and the site representatives of the Employer shall have the following respective references:

      | Home Office   | CR-H-nnn |
      | Site          | CR-S-nnn |

   (b) The above number “nnn” is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal Change Order.
REQUEST FOR CHANGE PROPOSAL

To: (Contractor’s Name and Address)                                      Date: .................

Attention: (Name and Title)

(Contract Name)…………………             (Contract No.)…………………..

Dear Ladies and/ or Gentlemen:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within .............. days of the date of this letter. (or on before[date])

1. Title of Change: .............................................................................

2. Change Request No................ (Rev............... ............)

3. Originator of Change:
   Employer (Name)..........................................................................
   Contractor (by Application for Change Proposal No...........*)
   * Refer to ANNEX 7.

4. Brief Description of Change:
   ..............................................................................................
   ..............................................................................................
   ..............................................................................................

5. Facilities and/ or Item No. of equipment related to the requested Change:
   ..............................................................................................
   ..............................................................................................
   ..............................................................................................

6. Reference drawings and /or technical documents for the request of Change:

   Drawings No. / Document No.        Description
   ............................................... ........................................
   ............................................... ........................................
   ............................................... ........................................

7. Detailed conditions or special requirements on the requested Change:
   ..............................................................................................
   ..............................................................................................
   ..............................................................................................
8. **General Terms and Conditions**:

(1) Please submit your estimate to us showing what effect the requested Change will have on the Contract Price.

(2) Your estimate shall include your claim for the additional time, if any for completion of the requested Change.

(3) If you have any opinion negative to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract on the safety of the Plant or Facilities Please inform us of your opinion in your proposal of revised provisions.

(4) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.

(5) You shall not proceed with the execution of the work for the requested Change Until we have accepted and confirmed the amount and nature in writing

..........................................
(Employer’s Name)

(Signature)

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

(Name of signatory)

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

(Title of signatory)
ESTIMATE FOR CHANGE PROPOSAL

(Contractor’s Letterhead)

To : (Employer’s Name and Address)  Date : …………………..

Attention : (Name and Title)

Contract Name……………………………

Contract Number…………………………

Dear Ladies and /or Gentlemen:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost of preparing the below-referenced Change Proposal in accordance with CC Sub-Clause 39.2.1 of the Conditions of Contract. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with CC Sub-Clause 39.2.2, is required before estimating the Cost for Change work.

1. Title of Change …………………………………………………………………

2. Change Request No………………………………..(Rev…………………..)

3. Brief Description of Change :

4. Scheduled Impact of Change :

5. Cost for Preparation of Change Proposal (in the currencies of the Contract)

(a) Engineering ..................................................(Amount)

(i) Engineer ______hrs x ______rate/hr = ______

(ii) Draftsperson ______hrs x ______rate/hr = ______

Sub-total ______hrs

Total Engineering Cost ______

(b) Other Cost ______

Total Cost (a) + (b) ______

(Contractor’s Name)

(Signature)

(Name of Signatory)

(Title of signatory)
ACCEPTANCE OF ESTIMATES

To : (Contractor’s Name and Address)       Date : …………………
Attention : (Name and Title)…………………………………………………….
Contract Name : ………………………
Contract Number………………………….

Dear Ladies and/or Gentlemen :

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change : …………………………………………………………….
2. Change Request No. …………………  (Rev ………………)
3. Estimate for Change Proposal No. …………  (Rev ………………)
4. Acceptance of Estimate No………… ………..  (Rev ………………)
5. Brief Description of Change :

6. Other Terms and Conditions In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparation of Change Proposal described in your estimate for Change Proposal mentioned in para. 3 above in accordance with CC Clause 39.0 of the Conditions of Contract.

..........................................
(Employer’s Name)
..........................................
(Signature)
..........................................
(Name and Title of signatory)
CHANGE PROPOSAL

(Contractor’s Letterhead)

To: (Employer’s Name and Address)  Date: …………………

Attention: (Name and Title)

(Contract Name) ………………… (Contract No.) …………………

Dear Ladies and / or Gentlemen

In response to your Request for Change Proposal No. …….. we hereby submit our proposal as follows:

1. Title of Change: (Name) ………………………

2. Change Request No. ………………… (Rev ………………………)

3. Originator of Change: Employer (Name) …………………

4. Brief Description of Change:

5. Reasons for Change:

6. Facilities and / or Item No. of equipment related to the requested Change:

7. Reference drawings and / or technical documents for the requested Change:

   Drawing No. / Document No.  Description
   …………………………………  …………………………………

8. Estimate of increase / decrease / (in the currencies of the contract to the Contract Price resulting from Change Proposal

   (Amount)

   (a) Direct Material  ………………………

   (b) Major construction equipment  ………………………

   (c) Direct field labour (Total hrs)  ………………………

   (d) Subcontracts  ………………………

   (e) Indirect material and labour  ………………………

   (f) Site supervision  ………………………
(g) Head office technical staff salaries

<table>
<thead>
<tr>
<th>Role</th>
<th>Hours</th>
<th>Rate/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process engineer</td>
<td>______</td>
<td>_______</td>
</tr>
<tr>
<td>Project engineer</td>
<td>______</td>
<td>_______</td>
</tr>
<tr>
<td>Equipment engineer</td>
<td>______</td>
<td>_______</td>
</tr>
<tr>
<td>Procurement</td>
<td>______</td>
<td>_______</td>
</tr>
<tr>
<td>Draftsperson</td>
<td>______</td>
<td>_______</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>______</td>
<td>_______</td>
</tr>
</tbody>
</table>

(h) Extraordinary costs (computer, travel, etc.)  _______________

(i) Fee for general administration________% of Items ______________

(j) Taxes and customs duties  _______________

Total lump sum cost of Change Proposal
[sum of Items (a) to (j)]  _______________

Cost to prepare Estimate for Change Proposal
(amount payable if Change is not accepted)  _______________

9. Additional time for Completion required due to Change Proposal:

10. Effect on the other Functional Guarantees.

11. Effect on the other terms and Conditions of the Contract.

12. Validity of this Proposal: Within …………………..days after receipt of this Proposal by the Employer.

13. Other Terms and Conditions of this Change Proposal:

(a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within……………..days from your receipt of this Proposal.

(b) The amount of any increase and/ or decrease shall be taken into account In the adjustment of the Contract Price.

(c) Contractor’s cost for preparation of this Change Proposal:

(Note) This cost shall be reimbursed by the Employer in case of Employer’s withdrawal or rejection of this Change Proposal without default of the Contractor in accordance with CC Clause 39.0 of the Conditions of Contract.

..................................................
(Contractor’s Name)

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

..................................................
(Name of signatory)

..................................................
(Title of signatory)
CHANGE ORDER

(Contractor's Letterhead)

To : (Employer's Name and Address) Date :  …………………
………………………………………………………………………
………………………………………………………………………
………………………………………………………………………

Attention :    (Name and Title)
………………………………………………………………………
………………………………………………………………………

(Contract Name) ........................................ (Contract No.) ………………
………………………………………………………………………
Dear Ladies and / or Gentlemen :

We approve the Change Order for the work specified in the Change Proposal No……..… and agree to adjust the Contract Price, Time for Completion and/ or other conditions of the Contract in accordance with CC Clause 39.0 of Conditions of Contract.

1. Title of Change : (Name) ........................................

2. Change Request No. .......................(Rev .......................)

3. Change Order No.......................(Rev .......................)

4. Originator of Change :        Employer (Name) ............................
Contractor (Name) ............................

5. Authorized Price :
Ref. No. ....................... ............(Number)
Date : .......................
Foreign currency portion .........plus Local currency portion............

6. Adjustment of Time for Completion

None  Increase ...............days  Decrease ...............days

7. Other effects, if any

Authorized by : .......................Date : .......................
(Employer)
Accepted by :  ....................... ....Date :  ....................... 
(Contractor)

…………………………………..
(Contractor's Name)
…………………………………..
(Signature)
…………………………………..
(Name of signatory)
…………………………………..
(Title of signatory)
PENDING AGREEMENT CHANGE ORDER

To : (Employer’s Name and Address) Date : ……………

Attention : (Name and Title)

(Contract Name) …………………. (Contract No.) ………………

Dear Ladies and / or Gentlemen :

We instruct you to carry out the work in the Change Order detailed below in accordance with CC 39.0 of the Conditions of Contract.

1. Title of Change : (Name) ………………………..…………………..

2. Employer Request for Change Proposal No……(Rev ………) Dated…………

3. Contractor’s Change Proposal No………… ……(Rev……….)  Dated…………

4. Brief Description of Change :
   ……………………………………………………………………………………..

5. Facilities and/ or Item No. of equipment related to the requested Change :
   ……………………………………………………………………………………..

6. Reference drawings and/ or technical documents for the requested Change
   Drawing No. / Document No. Description
   ……………………………………………………………………………………..

7. Adjustment of time for completion :

8. Other change in the Contract terms :

9. Other terms and Conditions :

   ……………………………………………………………………………………..

   (Contractor’s Name)

   (Signature)

   ……………………………………………………………………………………..

   (Name of signatory)

   ……………………………………………………………………………………..

   (Title of signatory)
APPLICATION FOR CHANGE PROPOSAL

To: (Employer’s Name and Address)  Date: .................

Attention: (Name and Title)

(Contract Name) ..................... (Contract No.) .................

Dear Ladies and / or Gentlemen:

We hereby propose that the below mentioned work be treated as a Change in the Facilities.

1. Title of Change:
   (Name) .................................................................

2. Application for Change Proposal No.............. (Rev ..............) Dated ............

3. Brief Description of Change:
   ........................................................................

4. Reasons for Change:
   ........................................................................

5. Order of Magnitude Estimation (in the currencies of the Contract).
   ........................................................................

6. Scheduled Impact of Change:
   ........................................................................

7. Effect on Functional Guarantee. If any:
   ........................................................................

8. Appendix
   ........................................................................

..................................................................................
   (Contractor’s Name)

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

..................................................................................
   (Name of signatory)

..................................................................................
   (Title of signatory)
CHANGE ORDER LOG

To : (Employer’s Name and Address)    Date :  …………………

Attention :    (Name and Title)

(Contract Name) ……………………….     (Contract No.) …………………

Dear Ladies and / or Gentlemen :

We hereby furnish the up-to date change order log to show the current status of request for changes and authorized or pending.

<table>
<thead>
<tr>
<th>S1. No.</th>
<th>Employer’s Request for change proposal revision</th>
<th>Contractor application for change applying including revision</th>
<th>Contractor’s Change proposal including revision</th>
<th>Change order No. proposal No. including revision</th>
<th>Pending</th>
<th>Remarks*</th>
</tr>
</thead>
</table>

(Contractor’s Name)
(Signature)
(Contractor’s Letterhead)

(Name of signatory)
Title of Signatory

Note :

(i) *In case Employer has authorized to carryout the work pending agreement change order, the details of such authorization shall be furnished.

(ii) The contractor shall attach a copy of the current change order log in the monthly progress report to be submitted to the Employer every month.
11. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY DELHI TRANSCO LTD. FOR PERFORMANCE OF ITS CONTRACT

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  DELHI TRANSCO LTD, a Company incorporated under the Companies Act, 1956 having its Registered Office at Shakti Sadan, Kotla Road, New Delhi-110002.

WHEREAS DELHI TRANSCO LTD. has awarded to the Contractor a contract for .........................vide its Notification of Award/ Contract No................. dated .............and its Amendment No.................(applicable when amendments have been issued) (hereinafter called the “Contract”) in terms of which DTL is required to hand over various Equipments to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No.............of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of DTL for the Equipment handed over to it by DTL for the purpose of performance of the Contract/ Erection portion of the contract (hereinafter called the “Equipment”)

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words………………………………) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep DTL indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipments 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 equipments duly endorsed by DTL in favour of the contractor shall be construed as handling 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 DTL.

2. That the contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the equipment of DTL project Site against all risks whatsoever till the equipment are duly used/erected in accordance with the terms of the contract and the plant/package duly erected and commissioned in accordance with the terms of the contract, is taken over by DTL. The contractor undertakes to keep DTL harmless against any loss or damage that may be caused to the equipments.

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 DTL is and shall remain the exclusive owner of the equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall be all times be open to inspection and checking by the employer or employer’s representative in this regard. Further DTL shall always be free at all times to take possession of the equipment in whatever form the equipment may be, if in its opinion, the equipments are likely to be endangered, mis-utilised or intended for 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 DTL to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer’s Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself
and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss to DTL without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to DTL 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 DTL, THEN. The above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

<table>
<thead>
<tr>
<th>Particulars of the Equipment</th>
<th>Quantity</th>
<th>Particulars of Despatch title Documents</th>
<th>Value of the Equipment</th>
<th>Signature of Attorney in Handed token of receipt</th>
</tr>
</thead>
</table>

RR/ GR No.  
Date of lading & Carrier

For and on behalf of  
M/s………………………………..  
WITNESS

1. 1. Signature…………………… Signature……………………………
2. Name………………………… Name………………………………
3. Address……………………… Address……………………………

Authorized 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 General Power of Attorney and such documents should be attached to Indemnity Bond.
12. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS BY DELHI TRANSCO LTD FOR PERFORMANCE OF ITS CONTRACT

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 favor of DELHI TRANSCO LTD a Company incorporated under the Companies Act, 1956 having its Registered Office at Shakti Sadan, Kotla Marg, New Delhi-110002

WHEREAS DTL has awarded to the Contractor a Contractor for .....................vide Its Notification of Award/Contract No. ..................dated ..............and Amendment No. ..........................(applicable when amendments have been issued ) (hereinafter called the “Contract”) in terms of which DTL is required to handover various Equipments to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No............of the said Contract, the Contractor is Required to execute an Indemnity Bond in favour of DTL for the Equipment handed over to it by DTL for the purpose of performance of the contract/ Erection portion of the Contract (hereinafter called the “Equipment”.)

NOW THEREFORE, This Indemnity Bond witnessed as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words .................) to be handed over to the Contractor in installments from time to for the purpose of performance of the contract, the Contractor hereby undertakes to indemnify and shall keep DTL indemnified, for the full value of Equipment. The Contractor hereby acknowledges receipt of the initial installment of the equipment per details in the schedule appended hereto. Further, the Contractor agrees to acknowledge receipt of the subsequent installments of the Equipment as required by DTL 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 shall be construed as handing over the Equipment purported to be covered by such title documents and the Contractor shall hold Equipments in trust as a Trustee for and on behalf of DTL

2. That the contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the equipment of DTL project Site against all risks whatsoever till the equipment are duly used/erected in accordance with the terms of the contract and the plant/package duly erected and commissioned in accordance with the terms of the contract, is taken over by DTL. The contractor undertakes to keep DTL harmless against any loss or damage that may be caused to the equipments.

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 DTL is and shall remain the exclusive owner of the equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall be all times be open to inspection and checking by the employer or employer’s representative in this regard. Further DTL shall always be free at all times to take possession of the equipment in whatever form the equipment may be, if in its opinion, the equipments are likely to be endangered, mis-utilised or intended for 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 DTL to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer’s Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself
and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay
the amount of loss to DTL without any demur, reservation or protest. This is without prejudice to
any other right or remedy that may be available to DTL 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 DTL, then, the above Bond shall be
void, but otherwise, it shall remain in full force and virtue.

IN WITNESS, the Contractor has hereunto set its hand through its authorized representative under the
common seal of the Company, the day, month and year first above mentioned.

**SCHEDULE No. 1**

<table>
<thead>
<tr>
<th>Particulars of the Equipment</th>
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<th>Particulars of Despatch title Documents</th>
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<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…………………….. Address……………………..

Authorized representative

2. 1. Signature…………………….

2. Name………….. (Common Seal)

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
General Power of Attorney and such documents should be attached to Indemnity Bond.
13. FORM OF AUTHORIZATION LETTER: DELHI TRANSCO LIMITED.

REF. No.

DATE:

TO,

M/s………………………
…………………………
…………………………

REF: Contract No……………………… dated ………… for……………………… awarded by Delhi Transco limited.

Dear Sir,

Kindly refer to Contract No. …………………………. Dated ……….. for ……….. You are hereby authorized on behalf of Delhi Transco Limited, having its registered office at Delhi Transco Limited, Shakti Sadan, Kotia Road New Delhi-110002 and its project at ……….to take physical delivery of materials/equipments covered under Dispatch Document/Consignment Note No……………… dated……………………… and as detailed in the enclosed schedule for the sole purpose of successful performance of the aforesaid contract and for no other purpose, whatsoever.

(Signature of project AUTHORITY)**

Designation .........................
Date .................................

Encl: As above

** To be signed not below the rank of Manager.
  • Mention LR/RR No.
14. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED

We M/s (Contractor’s Name) having our Principal place of business at ___________________________ having been awarded a Contract No. _______________ dated _______________ for (Contract Name) by (Name of Employer) _________________________.

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR etc and in the schedule annexed here to, which shall form an integral part of this receipt as “Trustee” of ____________________________ (Name of Employer). The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid contract and for no other purpose whatsoever. We undertake not to create any charge, lien or encumbrance over the aforesaid materials etc, in favour of any other person /institution (s) / Banks.

For M/s ________________________________

(Contractor’s Name)

Dated: _______________

Place: _______________

(AUTHORISED SIGNATORY)

SEAL OF COMPANY
15. FORM OF EXTENSION OF BANK GUARANTEE

Ref. No…………………….. Dated………………………

Delhi Transco Limited,
Shakti Sadan, Kotla Road
New Delhi 110002.
India

Dear Sirs,


At the request of M/s ……………………. We ………………….. Bank branch office at……………. Having its Head Office at …………………… do hereby extend our liability under the above mentioned Guarantee No……………………… dated ………….. for a further period of ………………. Years/Month from ………………. Expire on ………………. Except as provided above, all other terms and conditions of the original Bank Guarantee No……………………. dated………………. shall remain unaltered and binding.

Please treat this as an integral part of the original Guarantee to which it would be attached.

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 who has issued the bank Guarantee.
16. FORM OF POWER OF ATTORNEY FOR JOINT VENTURE/CONSORTIUM - NOT APPLICABLE

(On Non-judicial Stamp paper of Appropriate Value to be purchased in the name of joint venture/Consortium)

KNOW ALL MEN BY THESE PRESENTS THAT WE, the partners whose details are given hereunder ……………………………. have formed a Joint venture/Consortium under the laws of ……………………………. And having our Registered Office(S) / Head Office(s) at …………………………………………………………… (hereinafter called the Joint venture/Consortium which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s …………………………being the partner in-charge do hereby constitute, nominate and appoint M/s ………………………………… a Company incorporated under the laws of ……………………………… and having its registered / Head Office at ………………… as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorized Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the joint venture/Consortium in regard to Specification No………………… Package ……………………… the bids for which have been invited by Delhi Transco Limited, Shakti Sadan Building, Kotla Road, New Delhi, India (hereinafter called the “Employer”) to undertaking the following acts:

i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the “Joint venture/Consortium”.

ii) To negotiate with the employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the ‘JOINT VENTURE/ CONSORTIUM’.

iii) To do any other act or submit any document related to the above.

iv) To receive, accept and execute the Contract for and on behalf of the “Joint venture/Consortium”.

It is clearly understood that the partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be default by all the partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The joint venture/Consortium hereby agrees and undertakes to ratify and confirm all and whatsoever the said Attorney/Authorized Representatives/Partner in-charge quotes in the bid, negotiates And signs the Contract with Employer and/or proposes to act on behalf of the Joint venture/Consortium by virtue of this Power of Attorney and the same shall bind the joint venture/Consortium as if done by itself.

In WITNESS THEREOF the partners Constituting the joint venture/Consortium as aforesaid have executed these present on this ………………… day of …………………. Under the Common Seal(s) of their Companies.

for and on behalf of the Partners of joint venture/Consortium

………………………………..

The Common Seal of the above Partners of the Joint venture/Consortium:

The Common Seal has been affixed the unto in the presence of:

WITNESS

1. Signature…………………………
   Name…………………………
   Designation…………………………
   Occupation…………………………

2. Signature…………………………
   Name…………………………
   Designation…………………………
   Occupation…………………………
17. FORM OF JOINT VENTURE/ CONSORTIUM AGREEMENT – NOT APPLICABLE

(On non-judicial stamp paper of appropriate value to be purchased in the name of joint venture/Consortium)

PERFORMA OF JOINT VENTURE/ CONSORTIUM AGREEMENT BETWEEN ..................................
AND ........................................ FOR BID SPECIFICATION NO............................ OF DELHI
TRANSCO LIMITED

THIS joint venture/Consortium agreement executed on this ................. day of Two thousand........... between M/s ....................... a company incorporated under the laws of ................................ and having its registered office at...........................(hereinafter called the “Lead partner” which expression shall include its successors, executors and permitted assigns), M/s ......... ........................................ a company incorporated under the laws of .................................................. and having its registered office at..............................................(hereinafter called “the partner” which expression shall include its successors, executors and permitted assigns) and M/s .................................................. a company incorporated under the laws of .................................................. and having its registered office at..............................................(hereinafter called “the partner” which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract (in case of award) against the specification No.......................... for...........................................(Name of the Package) ............under..................(Name of the project) of Delhi Transco limited, a company incorporated under the Companies Act of 1956 having its registered Shakti Sadan, Kotla Road New Delhi-110002, India (hereinafter caller the; “Employer”)

Whereas the employer invited bids as per the above mentioned Specification for the design, engineering, manufacture, supply, installation, testing and commissioning of equipment/materials stipulated in the bidding documents for..................(Name of the Package) ............under..................(Name the project)

AND WHEREAS Annexeure-A, section-CC (qualification of the bidder) forming part of the bidding documents stipulates that a joint venture/Consortium of two or more qualified firms as partners, meeting the joint venture/Consortium fulfills all other requirements under Annexure-A, Section CC (qualification of the bidder) and in such a case, the BID FROM shall be signed by all the partners so as to legally bind all the partners of the Joint venture/Consortium, who will be jointly and severally liable to perform the contract and all obligations hereunder.

NOW THIS INDENTURE WITNESS AS UNDER:

In consideration of the above premises and agreements all the partners to this joint venture/Consortium do hereby now agree as follow:

1. In consideration of the award of the contract by the Employer to the joint venture/Consortium partners, we, the partners to the joint venture/Consortium agreement do hereby agree that M/s ........................................ shall act as lead partner and further declare and confirm that we shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, engineering, manufacture, supply, and successful performance of the equipments in accordance with the Contract.

2. In case of any breach of the said Contract by the Lead Partner or other partner(s) of the joint venture/Consortium agreement, the partner(s) do hereby agree to be fully responsible for the successful performance of the contract and carry out all the obligations and responsible under the Contract in accordance with the requirements of the Contract.

3. Further if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performance guaranteed as per the specification in terms if the Contract, the partner(s) of these present undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be
necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Partner(s).

4. The financial liability of the partner of this joint venture/ Consortium agreement to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in the said joint venture/ Consortium agreement, read in conjunction with the relevant conditions of the Contract shall, however, not be limited in any way so as to restrict or limit the liabilities of any of the partners of the joint venture/ Consortium agreement.

5. It is expressly understood and agreed between the partners to the joint venture/ Consortium agreement that the responsibilities and obligations of each of the partners shall be as delineated in Appendix-I (* To be incorporated suitably by the partners) to this agreement. It is further agreed by the partners that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and severable responsibilities of the partners under this Contract.

6. This joint venture/ Consortium agreement shall be constructed and interpreted in accordance with the laws of India and the courts of Delhi shall have the exclusive jurisdiction in all matters arising there under.

7. In case of an award of a Contract, we the partners to the joint venture/ Consortium agreement do hereby agree that we shall be jointly and severally responsible for furnishing a contract performance security from a bank in favour of the Employer in the currency of the Contract.

8. It is further agreed that the venture agreement shall be irrevocable and shall from an integral part of the Contract, and shall continue to be enforceable till the Employer discharges the same. It shall be effective from the date first mentioned above for all purpose and intents.

IN WITNESS WHEREOF, the partners to the joint venture/ Consortium agreement have through their authorized representatives executed these present and affixed Common Seals of their companies, on the day, month and year first mentioned above.

1. Common Seal of .................
   has been affixed in my/our presence pursuant to the Board of Director's resolution dated...
   Signature............................
   Name.................................
   Designation...........................  
   For Lead partner
   (Signature of authorized representative)
   Name....................................
   Designation............................
   Common Seal of the company
   ........................................

2. Common Seal of .................
   has been affixed in my/our presence pursuant to the Board of Director's resolution dated...
   Signature............................
   Name.................................
   Designation...........................  
   For partner
   (Signature of authorized representative)
   Name....................................
   Designation............................
   Common Seal of the company
   ........................................

WITNESSES:
1. ........................................
   (Signature)
   Name....................................
   ........................................
   (Official address)

2. ........................................
   (Signature)
   Name....................................
   ........................................
   (Official address)
18. PROFORMA OF JOINT UNDERTAKING BY THE COLLABORATOR/ PARENT COMPANY/PRINCIPAL ALONGWITH THE BIDDER/MANUFACTURER

(On/non-judicial stamp paper of appropriate value)

THIS DEED OF UNDERTAKING executed this ………………… day of Two Thousand and……………… by M/s……………………… a company incorporated under the laws of ……………………………. and having its registered office at……………………………(hereinafter called the “Collaborator/Parent Company/Principal” which expression shall include its successors, administrators, executors and permitted assigns) and M/s…………….a company incorporated under the laws of …………………………….. and having its registered office at……………………………(hereinafter called the “Bidder/Manufacturer” which expression shall include its successors, administrators, executors and permitted assigns) in favour of Delhi Transco Limited, having its Registered office at Shakti Sadan, Kotla Marg, New Delhi.(herein after called the “Employer” which expression shall include its successors, executors and permitted assigns)

WHEREAS the “Employer” invited Bid as per Specification No. ………….. for the execution of ……………..(Insert name of the Project)…….

AND WHEREAS Clause No. ………… , Section ……………..,of ………., Vol.-……………forming part of the Bidding Documents inter-alia stipulates that the Bidder and/or Manufacturer alongwith its collaborator/parent company/principal must fulfill the Qualifying Requirements for the * ……………….. and be jointly and severally bound and responsible for the successful performance of the *………………. offered in the event the bid submitted by the bidder is accepted by the Employer resulting in Contract.

AND WHEREAS the bidder has submitted its bid to the Employer vide Proposal No. ……………….. dated ………………..based on the collaboration /association of the collaborator/parent company/principal with the Bidder/Manufacturer.

NOW THEREFORE THIS UNDERTAKING WITNESSTH as under.

1.0 In consideration of the award of Contract by the Employer to the Bidder (herein after referred to as the “Contract”) we, the collaborator/parent company/principal and the Bidder/Contractor and/or manufacturer do hereby declare that we shall be jointly and severally bound unto the DELHI TRANSCO LIMITED , for the successful performance of the * ……………….. and shall be fully responsible for the design, manufacturer, testing, supply on FOR destination delivery at site basis and supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the *……………….in accordance with the Contract Specifications.

2.0 Without in any way affecting the generality and total responsibility in terms of deed of Undertaking, the collaborator/parent company/principal in particular hereby agrees to depute their technical experts from time to time to the Bidder/Contractor’s/Manufacture’s Works/ Employer’s project site as mutually considered necessary by the Employer, bidder/Contractor, Manufacturer and the collaborator/parent company/principal to ensure.

3.0 This deed of undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Delhi shall have exclusive jurisdiction in all matters arising under the undertaking.

4.0 As a security, the bidder shall apart from the contractor’s performance guarantee furnish a contract performance guarantee from its Bank in favour of the Employer on a form acceptable to the Employer. The value of such guarantee shall be equivalent to 10% of price of such equipments manufactured in India as identified in the contract awarded by the Employer to the bidder/contractor and it shall be part of guarantee towards the faithful performance/ compliance of this deed of undertaking in terms of the contract. The guarantee shall be unconditional, irrevocable and valid for the entire period of the contract, namely till the end of the defect liability period of Transformer under the contract. The bank guarantee amount shall be payable to the Employer on demand without any reservation or demur. This shall be in addition to the contract performance guarantee furnished by the contractor.

5.0 We the collaborator/parent company/principal and bidder/contractor and/or manufacturer agree that this undertaking shall be irrevocable and shall from an integral part of the contract and further agree that this undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of contract.

IN WITNESS WHEREOF the collaborator/parent company/principal and bidder/contractor and/or manufacturer, have through their Authorized Representatives executed these present and affixed common seals of their respective Companies, on the day, month and year first above mentioned.
WITNESSES:

1.-----------------------                                                  Signature of Authorized Representative
(Signature)
(Name in Block Letter)                                                  Name--------------------
(Office Address)                                                        Common seal of Company --------------------------------

2.-----------------------                                                  Signature of Authorized Representative
(Signature)
(Name in Block Letter)                                                  Name--------------------
(Office Address)                                                        Common seal of Company--------------------------------

For Manufacturer

3.-----------------------                                                  Signature of Authorized Representative
(Signature)
(Name in Block Letter)                                                  Name--------------------
(Office Address)                                                        Common seal of Company--------------------------------

Note:
(i) This deed of Joint undertaking duly certified by the Company Secretary shall be submitted along with the bid. Further, the deed of Joint Undertaking attested by Notary Public of the place(s) of the respective executants (s) or registered with the Indian Embassy/ High Commission in the country shall be submitted by the bidder before opening of price bid. In case the bidder fails to submit the deed of Joint Undertaking as mentioned above, the bidders bid guarantee may be forfeited.
(ii) In the event the bidder is a Manufacturer and the collaboration is between collaborator and the Bidder, then the Joint deed of Undertaking shall be continued accordingly.
(iii) *The name(s) of equipment for which Joint deed of undertaking is to be submitted is to be inserted.
(iv) The manufacturer may be having ongoing collaboration agreement or had collaboration agreement in the past with the collaborator.
19. FORM OF TAKING OVER CERTIFICATE

Date…………………….

Name of Contract………
Contract No……………

To:

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to CC 24 & 25 of the Conditions of the Contract entered into between yourselves and the Employer dated ………………………………… relating to the ………………………………….(Brief description of the Facilities)

we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below:

1. Description of the Facilities or part thereof... …………………………………...

2. Date of Completion…

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)
DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)

VOLUME – II

TECHNICAL SPECIFICATION

For

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.
CONTENTS

SECTION - I PROJECT

SECTION - II TECHNICAL SPECIFICATIONS OF TRANSFORMER

SECTION - III TECHNICAL SPECIFICATIONS OF NIFPES
SECTION – I

PROJECT
1. **General:**

1.1 Delhi Transco Ltd. hereinafter termed, as DTL or Owner is a company incorporated under company Act 2013 fully owned by Govt. of NCT of Delhi.

1.2 Delhi Transco Limited (DTL), a Govt. of NCT of Delhi Undertaking is responsible for transmission of Power and Bulk Power Supply (Electrical Energy) in National Capital of Delhi.

1.3 Delhi Transco Ltd. (DTL) is now requires Power Transformers for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

2. **SCOPE OF WORK**

2.1 The scope of this specification covers the following:

Supply, Erection, Testing & Commissioning (excluding civil works) of following Transformers along with all fittings, accessories, Marshalling box for each Transformer and mandatory spares:-


2.2 The detailed scope of works is brought out in the subsequent clauses of this section.

2.2.1 160MVA, 220/66/11kV Power Transformer for replacement of 100 MVA 220/66 kV Power Transformer at Najafgarh GIS Substation

(i) Design, engineering, manufacture, testing at manufacturer’s works, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning (excluding civil works) at site of the transformers mentioned above including all materials, Nitrogen injection fire prevention and extinguishing system (NIFPES), NCT including foundation/Structure (if required), cables (between Transformer & its Marshalling box) including supply of special cable (if any) & accessories for transformers.
(ii) Digital RTCC panel including control cable from Marshalling box to RTCC Panel as per requirement.

(iii) Supply of Oil storage tank as per Bid Price Schedule.

(iv) Design, engineering, manufacture, testing, supply on FOR destination site basis including transportation & insurance, storage at site of mandatory spares as per Bid Price schedule.

(v) Foundation bolts along with fixing in the foundation for Transformers including Radiator bank. The contractor shall indicate recommended pocket size for placing foundation bolts (included in the bidder scope of supply) in their foundation plan drawing.

(vi) Upgradation of earthing of Transformer.

(vii) Marshalling Box location will remain same as existing, if any.

2.2.2 160MVA, 220/66/11kV Power Transformer at Kanjhawala Substation

(i) Design, engineering, manufacture, testing at manufacturer’s works, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning (excluding civil works) at site of the transformers mentioned above including all materials, Nitrogen injection fire prevention and extinguishing system (NIFPES), NCT including foundation/Structure (if required), cables (between Transformer & its Marshalling box) including supply of special cable (if any) & accessories for transformers.

(ii) Digital RTCC panel including control cable from Marshalling box to RTCC Panel as per requirement.

(iii) Supply of Oil storage tank as per Bid Price Schedule.

(iv) Design, engineering, manufacture, testing, supply on FOR destination site basis including transportation & insurance, storage at site of mandatory spares as per Bid Price schedule.

(v) Foundation bolts along with fixing in the foundation for Transformers including Radiator bank. The contractor shall indicate recommended pocket size for placing foundation bolts (included in the bidder scope of supply) in their foundation plan drawing.

(vi) Upgradation of earthing of Transformer.

(vii) Marshalling Box location will remain same as existing, if any.
2.2.3 160MVA, 220/66/11kV Power Transformer (1 no. new transformer & 1 no. replacement of 100 MVA Power Transformer) at Gopalpur GIS Substation

(i) Design, engineering, manufacture, testing at manufacturer’s works, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning (excluding civil works) at site of the transformers mentioned above including all materials, Nitrogen injection fire prevention and extinguishing system (NIFPES), NCT including foundation/Structure (if required), cables (between Transformer & its Marshalling box) including supply of special cable (if any) & accessories for transformers.

(ii) Digital RTCC panel including control cable from Marshalling box to RTCC Panel as per requirement.

(iii) Supply of Oil storage tank as per Bid Price Schedule.

(iv) Design, engineering, manufacture, testing, supply on FOR destination site basis including transportation & insurance, storage at site of mandatory spares as per Bid Price schedule.

(v) Foundation bolts along with fixing in the foundation for Transformers including Radiator bank. The contractor shall indicate recommended pocket size for placing foundation bolts (included in the bidder scope of supply) in their foundation plan drawing.

(vi) Upgradation of earthing of Transformer.

(vii) Marshalling Box location will remain same as existing, if any.

2.2.4 160MVA, 220/66/11kV Power Transformer at Budella GIS Substation

(i) Design, engineering, manufacture, testing at manufacturer’s works, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning (excluding civil works) at site of the transformers mentioned above including all materials, Nitrogen injection fire prevention and extinguishing system (NIFPES), NCT including foundation/Structure (if required), cables (between Transformer & its Marshalling box) including supply of special cable (if any) & accessories for transformers.

(ii) Digital RTCC panel including control cable from Marshalling box to RTCC Panel as per requirement.

(iii) Supply of Oil storage tank as per Bid Price Schedule.

(iv) Design, engineering, manufacture, testing, supply on FOR destination site basis including transportation & insurance, storage at site of mandatory spares as per Bid Price schedule.
(v) Foundation bolts along with fixing in the foundation for Transformers including Radiator bank. The contractor shall indicate recommended pocket size for placing foundation bolts (included in the bidder scope of supply) in their foundation plan drawing.

2.2.5 160MVA, 220/66/11kV Power Transformer at Sanjay Gandhi Transport Nagar GIS Substation

(i) Design, engineering, manufacture, testing at manufacturer’s works, transportation, unloading and delivery at site including insurance & storage, erection, testing and commissioning (excluding civil works) at site of the transformers mentioned above including all materials, Nitrogen injection fire prevention and extinguishing system (NIFPES), NCT including foundation/Structure (if required), cables (between Transformer & its Marshalling box) including supply of special cable (if any) & accessories for transformers.

(ii) RTCC panel including control cable from Marshalling box to RTCC Panel as per requirement.

(iii) Supply of Oil storage tank as per Bid Price Schedule.

(iv) Design, engineering, manufacture, testing, supply on FOR destination site basis including transportation & insurance, storage at site of mandatory spares as per Bid Price schedule.

(v) Foundation bolts along with fixing in the foundation for Transformers including Radiator bank. The contractor shall indicate recommended pocket size for placing foundation bolts (included in the bidder scope of supply) in their foundation plan drawing.

2.2.6 The complete design and detailed engineering shall be done by the Contractor.

2.2.7 Earthing connection of Transformers to Owner’s earth mat & earth electrodes.

2.2.8 220kV, 66kV, 33kV & 11kV (as applicable) Terminal Connectors for Transformers.

2.2.9 Owner has standardized the technical specification for the Transformers. Technical specification for such Items, which are not applicable for the scope of this package, shall not be referred to.

3.0 EXCLUSION

The following items of work are specifically excluded from the scope of this specification.
i) Fire protection system for Transformers (except Nitrogen injection fire prevention and extinguishing system (NIFPES)).
ii) All civil works pertaining to foundations including rail track, soak pit & fire resistant wall.
iii) All cabling work from control room to Transformer MB including supply of cable except special cable (if any).

4.0 SCHEDULE OF QUANTITIES

The bill of quantity is indicated in the Bid price Schedules.

Bidder should indicate all such items in the bid proposal sheets which are not specifically mentioned but are essential for execution of the contract. Items which explicitly may not appear in various schedules and required for successful commissioning of the equipments in the scope of specification shall be included in the bid price and shall be provided at no extra cost to Owner.

5.0 REFERENCE DRAWINGS

5.1 The reference drawings that form a part of the specifications are given in the Section -UPTO 220 kV Transformer. However, the foundation Layout and the position of cooler bank of the Transformers shall depend on the substation layout arrangement and therefore shall be finalized during detailed engineering.

In case of any discrepancy between the drawings and text of specification, the requirements of text shall prevail in general. However, the bidder is advised to get these clarified from Owner.

6.0 DIFFERENT SECTIONS OF TECHNICAL SPECIFICATION

For the purpose of present scope of work, technical specification (Vol. II) shall consist of following sections and they should be read in conjunction with each other.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Section- Project</td>
</tr>
<tr>
<td>2.0</td>
<td>Section- Technical Specification of Transformer</td>
</tr>
<tr>
<td>3.0</td>
<td>Section-Technical Specification of NIFPES</td>
</tr>
</tbody>
</table>

In case of any discrepancy between Section-PROJECT and other sections, Section- PROJECT shall prevail over the other sections.

7.0 MANDATORY SPARES

The Mandatory Spares shall be included in the bid proposal by the bidder. The prices of these spares shall be given by the Bidder in the relevant schedule of BPS and shall be considered for evaluation of bid. It shall not be binding on the Owner to procure all of these mandatory spares.
Mandatory spares shall not be used during the commissioning of the equipment. Any spares required for commissioning purpose shall be arranged by the Contractor. The unutilized spares, if any, brought for commissioning purpose shall be taken back by the Contractor.

8.0 SPECIAL TOOLS AND TACKLES

The bidder shall include in his proposal the deployment of all special tools and tackles required for erection, testing, commissioning and maintenance of equipment. The special tools and tackles shall only cover items which are specifically required for the equipment offered and are proprietary in nature. However a list of all such devices should be indicated in the relevant schedule provided in the BPS. In addition to this the Contractor shall also furnish a list of special tools and tackles for the various equipment in a manner to be referred by the Employer during the operation of these equipments. The scope of special tools and tackles are to be decided during detail engineering and the list of special tools and tackles, if any shall be finalized.

9.0 SPECIFIC REQUIREMENT

9.1 Transformer with separate cooler bank arrangement, the main tank shall have provision such that cooler banks can be placed on either side of the main tank without the need of any extra member/pipe maintaining the electrical clearances. The position of cooler banks of transformer shall be decided based on substation layout requirement.

9.2 11kV tertiary winding of Power transformer shall be suitable for connection to LT transformer for auxiliary supply.

9.3 Managed Ethernet switch, LIU patch cords etc. shall be provided in Marshalling Box. All IEC 61850 compliant signals from various monitoring equipment / accessories shall be wired up to the Ethernet switch.

10.0 FOUNDATIONS (Civil works)

Foundation shall be provided by the Owner. The Contractor shall furnish all relevant drawing/data for design of foundation by the Owner within 60 days from the date of award. A copy of foundation drawings of the equipment prepared by the Owner shall be sent to the Contractor for comments and the same shall be returned to the Owner within 15 days with Contractor’s comments if any, failing which it will be presumed that the drawing is acceptable to the Contractor. Any modification to the foundation, which may become necessary due to any reason thereafter, attributable to the Contractor, shall be at the cost of the Contractor.
SECTION – II

TECHNICAL SPECIFICATION OF
TRANSFORMER
1.0) SECTION – I: Constructional Details & Detailed Description

Climatic Conditions:-

<table>
<thead>
<tr>
<th>1. Temperature:</th>
<th>The reference ambient temperature be taken as 43.3 °C as per IS 9676.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Maximum ambient air temperature</td>
<td>50°C</td>
</tr>
<tr>
<td>b. Maximum daily average ambient temp</td>
<td>40°C</td>
</tr>
<tr>
<td>c. Maximum indoor ambient temp</td>
<td>35°C</td>
</tr>
</tbody>
</table>

| 2. Relative Humidity: |
|------------------|-----------------------------------------------|
| a. Maximum Relative Humidity | 100% |
| b. Minimum Relative Humidity | 10% |

3. Average annual rainfall 750 mm
4. Average no. of rainy day 50
5. Average no. of thunderstorm days per annum 40
6. Altitude Not exceeding 300 meters
7. Rain months June to Oct.
8. Wind pressure as per IS 875 195 Kg/Sq. meters up to 30 meters

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. Heavy lightening occurs in the area during rainy months (June to October).

All equipment shall be designed to withstand seismic forces, corresponding to an acceleration of 0.3 g horizontal.

1.1 CONSTRUCTION DETAILS

1.2 The features and construction details of each power transformer shall be in accordance with the requirements stated herein under.

1.2 TANK CONSTRUCTION
1.2.1 Tank shall be of welded construction and fabricated from tested quality low carbon steel of adequate thickness. Unless otherwise approved, metal plate, bar and sections for fabrication shall comply with BS-4360/IS 2062. The components and fitting associated with transformers are subject to Owner’s approval.

1.2.2 All seams and joints not required to be opened at site shall be factory welded and wherever possible they shall be double welded. Welding shall conform to BS-5135/IS 9595. After fabrication of tank and before painting, dye penetration test shall be carried out on welded parts of jacking bosses, lifting lugs and all load bearing members. The requirement of post weld heat treatment of tank/stress relieving shall be based on recommendation of BS-5500 table 4.4.3.1/IS 10801.

1.2.3 Four symmetrically placed lifting lugs shall be provided so that it will be possible to lift the complete transformer when filled with oil without structural damage to any part of the transformer. The factor of safety at any one point shall not be less than 2. The lifting lugs shall be so arranged and located as to be accessible for use when the transformer is loaded on the transport vehicle.

A minimum of four jacking pads in accessible position to enable the transformer complete with oil to be raised or lowered using hydraulic jacks. Each jacking pad shall be designed to support with an adequate factor of safety for at least half of the total mass of the transformer filled with oil allowing in addition for maximum possible misalignment of the jacking force to the centre of the working surface.

a) Suitable haulage holes shall be provided.

b) 04 nos. of Gate valves for UHF sensors for PD Measurements (applicable for 220kV and above Transformer only) at various locations. Location of valves shall be finalized during design review.

c) Suitable provisions of pockets for OTI, WTI & RTDs including two spare pockets.

1.2.4 Tank stiffeners shall be provided for general rigidity and these shall be so designed as to prevent any retention of water.

1.2.5 The tank shall be designed to withstand.
   i) Mechanical shocks during transportation
   ii) Vacuum of 760mm of Hg.
   iii) Continuous internal pressure over normal hydrostatic pressure of oil as well as the pressure developed due to abnormal condition which may arise during service.
   iv) Earthquake forces as per Seismic zone
   v) Short Circuit forces

1.2.6 The base of each tank shall be so designed that it shall be possible to move the complete transformer unit by skidding in any direction without injury when using plates or rails.
1.2.7 The transformer tank and its accessories shall be so designed as to avoid collection of gas/air.

1.2.8 Bolted inspection opening shall be provided on the sides of the tank near the bottom to observe the position of the core.

1.2.9 Inspection opening shall be provided on the tank to facilitate inspection of Core, assembly fittings and fixtures etc.

1.2.10 Adequate space shall be provided at the bottom of the tank for collection of sediments.

1.2.11 Transformer shall have the provision for installation of the Nitrogen Injection Fire Prevention and Extinguishing System.

1.2.12 Tank hotspot

The maximum temperature on any metal part of the tank shall not exceed 130 deg. Celsius.

1.2.13 the transformer shall be provided with a 100 mm nominal diameter pipe flange with bolted blanking plate, gasket and shall be fitted at the highest point of the transformer tank for maintaining vacuum in the tank.

1.3.0 Tank Cover

1.3.1 The base of each tank shall be so designed that it shall be possible to move the complete transformer unit by skidding in any direction without damage when using plates or rails.

1.3.2 The tank cover shall be designed to prevent retention of water and shall not distort when lifted. The internal surface of the top cover shall be shaped to ensure efficient collection and direction of free gas to the Buchholz relay.

1.3.3 At least two adequately sized inspection openings one at each end of the tank, shall be provided for easy access to bushings and earth connections. The inspection covers shall not weigh more than 25 kg. Handles shall be provided on the inspection cover to facilitate lifting.

1.3.4 The tank cover shall be provided with pockets for oil and winding temperature indicators. The location of pockets (for OTI, WTI & RTDs including two spare pockets) shall be in the position where oil reaches maximum temperature. Further, it shall be possible to remove bulbs of OTI/WTI/RTD without lowering the oil in the tank. The thermometer shall be fitted with a captive screw to prevent the ingress of water.

1.3.5 Bushing turrets, covers of inspection openings, thermometer pockets etc. shall be designed to prevent ingress of water into or leakage of oil from the tank.

1.3.6 To allow for the effect of possible induced and capacitive surge current flow, the tank cover and bushing turret shall be fixed to the transformer in such a
way that good electrical contact is maintained around the perimeter of the tank and turrets.

1.3.7 The transformer shall be provided with a suitable diameter pipe flange, butterfly valve, bolted blanking plate and gasket shall be fitted at the highest point of the transformer for maintaining vacuum in the tank.

1.3.8 Gas venting - The transformer cover and generally the internal spaces of the transformer and all pipe connections shall be designed so as to provide efficient venting of any gas in any part of the transformer to the Buchholz relay. The space created under inspection /manhole covers shall be filled with suitable material to avoid inadvertent gas pockets.

1.3.9 Gasket for tank & cover

All gasket joints shall be designed, manufactured and assembled to ensure long-term leak and maintenance free operation. All gasket joints shall preferably of O-ring and groove type. The Gaskets / O-Ring in contact with oil shall be of Neoprene.

All bolted connections shall be fitted with weather proof, hot oil resistant, resilient gasket in between for complete oil tightness. If gasket is compressible, metallic stops/other suitable means shall be provided to prevent over-compression.

The properties of all the above gaskets / O-Rings shall comply with the requirements of IS-11149. Gaskets and O-rings shall be replaced every time whenever the joints are opened.

1.4 AXLES AND WHEELS

1.4.1 The transformers shall be provided with flanged, bi-directional wheels and axles. These shall be so designed that under both the directions of movement they shall not deflect as to interfere with the movement of the transformer. Wheels shall be provided with suitable bearings which shall be rust corrosion resistant. Fittings/nipples for lubrication shall also be provided or the bearing shall be of permanently lubricated type.

1.4.2 All wheels should be detachable and shall be made of cast iron or steel as required. Suitable locking arrangement shall be provided for the wheels to prevent accidental movement of transformer.

1.4.3 The wheels are required to swivel and they shall be arranged so that they can be turned through an angle of 90 degree when the tank is jacked up clear off the rails. Means shall be provided for locking the swivel movements in positions parallel to or at right angles to the longitudinal axis of the tank.

1.4.4 The wheel centre in both directions shall be 1676 mm to facilitate placement of transformer on rails spaced 1676 mm centre to centre.

1.5.0 Conservator
1.5.1 Main tank conservator shall have air cell type conservator oil preservation system to prevent oxidation and contamination of oil due to contact with moisture. Conservator shall be fitted with magnetic oil level gauge with potential free high and low oil level alarm contacts and prismatic oil level gauge.

1.5.2 Conservator tank shall have adequate capacity with highest and lowest visible levels to meet the requirements of expansion of total cold oil volume in the transformer and cooling equipment from minimum ambient temperature to top oil temperature of 110 deg C. The capacity of the conservator tank shall be such that the transformer shall be able to carry the specified overload without overflowing of oil.

1.5.3 The conservator shall be fitted with lifting lugs in such a position so that it can be removed for cleaning purposes. Suitable provision shall be kept to replace air cell and cleaning of the conservator as applicable.

1.5.4 Conservator shall be positioned so as not to obstruct any electrical connection to transformer.

1.5.5 The connection of air cell to the top of the conservator is by air proof seal preventing entrance of air into the conservator. The main conservator tank shall be stenciled on its underside with the words “Caution: Air cell fitted”. Lettering of at least 150 mm size shall be used in such a way to ensure clear legibility from ground level when the transformer is fully installed. To prevent oil filling into the air cell, the oil filling aperture shall be clearly marked. The transformer rating and diagram plate shall bear a warning statement that the “Main conservator is fitted with an air cell”.

1.5.6 Contact of the oil with atmosphere is prohibited by using a flexible air cell of nitrile rubber reinforced with nylon cloth. The temperature of oil in the conservator is likely to raise up to 110°C during operation. As such air cell used shall be suitable for operating continuously at this temperature.

1.5.7 The transformer manual shall give full and clear instructions on the operation, maintenance, testing and replacement of the air cell. It shall also indicate shelf life, life expectancy in operation, and the recommended replacement intervals.

1.5.8 The conservator tank and piping shall be designed for complete vacuum / filling of the main tank and conservator tank. Provision must be made for equalizing the pressure in the conservator tank and the air cell during vacuum / filling operations to prevent rupturing of the air cell.

1.5.9 The contractor shall furnish the leakage rates of the rubber bag/ air cell for oxygen and moisture. It is preferred that the leakage rate for oxygen from the air cell into the oil will be low enough so that the oil will not generally become saturated with oxygen. Air cells with well proven long life characteristics shall be preferred.
1.5.10 OLTC shall have conventional type conservator (without air cell) with magnetic oil level gauge with potential free oil level alarm contact and prismatic oil level gauge.

1.5.11 Piping works for conservator.

1.5.12 Pipe work connections shall be of adequate size preferably short and direct. Only radiuses elbows shall be used.

1.5.13 The feed pipe to the transformer tank shall enter the transformer cover plate at its highest point and shall be straight for a distance not less than five times its internal diameter on the transformer side of the Buchholz relay, and straight for not less than three times that diameter on the conservator side of the relay. This pipe shall rise towards the oil conservator, through the Buchholz relay, at an angle of not less than 5 degrees. The feed pipe diameter for the main conservator shall be not less than 80mm. The Gas-venting pipes shall be connected to the final rising pipe between the transformer and Buchholz relay as near as possible in an axial direction and preferably not less than five times pipe diameters from the Buchholz relay.

1.5.14 A double flange valve of preferably 50 mm and 25 mm size shall be provided to fully drain the oil from the main tank conservator and OLTC conservator tank respectively.

1.5.15 Pipe work shall neither obstruct the removal of tap changers for maintenance or the opening of inspection or manhole covers.

1.6.0 PRESSURE RELIEF DEVICE:

1.6.1 Pressure Relief Device

Adequate number of pressure relief devices (at least 2 numbers) shall be provided at suitable locations preferably close to bushing turret/ cover. These shall have opening diameter of at least 100 mm for rapid release of any pressure that may be generated in the tank and which may result in damage to equipment. The device shall maintain its oil tightness under static oil pressure equal to the static operating head of oil plus 20 kPa. The device shall operate and attain its full opening in not more than 2.5 ms when subject to an internal pressure impulse equal to static operating head of oil plus 50 kPa. It shall be capable of withstanding full internal vacuum at mean sea level. It shall be mounted directly on the tank. Suitable canopy shall be provided to prevent ingress of rain water. One set of potential free contacts (with screw type arrangement) per device shall be provided for tripping. Following routine tests shall be conducted on PRD:

a) Air pressure test
b) Liquid pressure test
c) Leakage test
d) Contact operation test
e) Dielectric test on contact terminals

1.6.2 Sudden Pressure Relay
One number of Sudden Pressure relay with alarm/trip contacts (Terminal connection plug & socket type arrangement) shall be provided on tank of transformer. Operating features and size shall be reviewed during design review. Suitable canopy shall be provided to prevent ingress of rain water. Pressurised water ingress test for Terminal Box (routine tests) shall be conducted on Sudden Pressure Relay.

1.7 GAS AND OIL ACTUATED RELAYS

1.7.1 The transformer shall be fitted with gas and oil actuated relay as per specification hereunder.

1.7.2 Each gas and oil actuated relay shall be provided with a test cock to take a flexible pipe connection for checking the operation of the relay.

1.7.3 Buchholz Relay

A double float/reed 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 and taking gas sample. A copper/stainless steel tube shall be connected from the gas collector to a valve located about 1200 mm above ground level to facilitate sampling with the transformer in service. The device shall be provided with two electrically independent ungrounded contacts, one for alarm on gas accumulation and the other for tripping on sudden rise of pressure.

The Buchholz relay shall not operate during starting/ stopping of the transformer oil circulation pumps under any oil temperature conditions. The use of pipe or relay aperture baffles shall not be used to decrease the sensitivity of the relay. The relay shall not mal-operate for through fault conditions or be influenced by the magnetic fields around the transformer during the external fault conditions. Pressurised water ingress test for Terminal Box (routine tests) shall be conducted on Buchholz relay.

1.7.4 A machined surface shall be provided on the top of each relay to facilitate the setting of the relays and to check the mounting angle in the pipe and the cross level of the relay.

1.7.5 The design of the relay mounting arrangements, the associated pipe work and the cooling plant shall be such that mal-operation of the relays shall not take place under normal service condition.

1.7.6 The pipe work shall be so arranged that all gas arising from the transformer shall pass into the gas and oil-actuated relay. The oil circuit through the relay shall not form a delivery path in parallel with any circulating oil pipe, nor shall it be tied or connected through the pressure relief vent. Sharp bends in the pipe work shall be avoided.

1.7.7 A sudden pressure relay shall be fitted on main tank to detect a sharp rise in internal pressure. An electrically insulated trip contact shall be provided in sudden pressure relay.
1.7.8 A surge relay shall also be provided between OLTC and conservator tank to detect a sharp rise in internal pressure. An electrically insulated trip contact shall be provided in the surge relay.

1.7.9 Provision shall be made for parallel wiring of all the alarm & trip events for separate annunciation on Employer panel.

1.8 CORE

1.8.1 The core shall be constructed from non-ageing, cold rolled high permeability grade (as per BIS / IEC) or better grain oriented silicon steel laminations. Indian transformer manufacturers shall use core material as per above specification with BIS certification.

1.8.2 The design of the magnetic circuit shall be such as to avoid static discharges, development of short circuit paths within itself or to the earthed clamping structure and production of flux component at right angles to the plane of laminations which may cause local heating. The temperature of any part of the core or its support structure in contact with oil shall not exceed 120 deg C under normal operating condition and 130 deg C under most extreme operating condition. Adequate temperature margin shall be provided to maintain longer life expectancy for this material.

1.8.3 The insulation structure for core to core bolts and core to clamp plates shall be able to withstand a voltage of 2.5 KV rms for 1 minute.

1.8.4 Core and windings shall be capable of withstanding shocks during transport, installation, service and adequate provision shall be made to prevent movement of core and winding relative to tank during these conditions including short circuit condition.

1.8.5 All steel sections used for supporting the core shall be thoroughly sand blasted, after cutting, drilling and welding.

1.8.6 With bell type tank construction suitable projecting guides shall be provided on core assembly to facilitate removal from the tank.

1.8.7 Every care shall be exercised in the selection, treatment and handling of core steel to ensure that as far as practicable, the laminations are flat and finally assembled core is free from distortion.

1.8.8 Oil ducts shall be provided wherever necessary to ensure adequate cooling. The winding structure and major insulation shall not obstruct the free flow of oil through such ducts.

1.8.9 Adequate lifting lugs shall be provided to enable the core and windings to be lifted.

1.8.10 The supporting frame work 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.
1.8.11 The air core reactance of HV winding of transformer shall not be less than 20%.

1.8.12 The core shall be earthed to the core clamping structure at one point only, through a removable external link suitably located and protected to facilitate testing after installation of the transformer. The removable links shall have adequate section to carry ground fault current. Separate identification name plate/labels shall be provided for the ‘Core’ and ‘Core clamp’ on the outside of tank cover.

In case core laminations are divided into sections by insulating barriers or cooling ducts parallel to the plane of the lamination, tinned copper bridging strips shall be inserted to maintain electrical continuity between sections.

A drawing furnishing the details of the internal earthing design shall be included in the manual.

1.9 EARTHING TERMINALS

Two earthing pads suitable for connecting mild steel flat shall be provided at positions close to each of the two bottom corners of the tank. These grounding terminals should be suitable for bolted connections. The earthing terminals shall be capable of carrying for 4 seconds the full load voltage, short circuit current of the transformer.

1.10 WINDINGS

1.10.1 The tenderer shall ensure that windings are made in dust proof, conditioned atmosphere. The tenderer shall furnish the facilities available at his works along with the Bid.

1.10.2 The conductors shall be of electrolytic copper. Current density in all the windings should not be more than 2.5 Amps/mm².

1.10.3 The conductors shall be of electrolytic grade copper free from scales and burrs.

1.10.4 The insulation of transformer windings and connections shall be free from insulating compounds which are liable to soften, ooze out, shrink or collapse and be non-catalytic and chemically inert in transformer oil during service.

1.10.5 Coil assembly and insulating spacers shall be so arranged as to ensure free circulation of oil and to reduce hot spot of the winding.

1.10.6 220kV and 66/33kV star connected winding shall have graded insulation as defined in IEC-60076/IS-2026. The tertiary delta connected winding wherever applicable shall be insulated for the voltage specified in clause 3.7 & 5.7 of section-III & V respectively. In the event the tenderer recommends to adopt higher insulation level of the tertiary, the offer should give complete detailed justification and calculations related thereto. Protection scheme shall be so designed that tertiary can be loaded for auxiliary supply.
1.10.7 The windings shall be designed to withstand impulse and power frequency test voltages as specified in IEC-60076/IS-2026 and clause 3.7 & 5.7 of section-III & V respectively of the specification.

1.10.8 The windings shall be designed to reduce to a minimum the out of balance forces in the transformer at all voltage ratios.

1.10.9 The stacks of windings shall receive adequate shrinkage treatment before final assembly. Adjustable devices shall be provided for taking up possible shrinkages of coils in service.

1.10.10 No strip conductor shall have a width on edge exceeding six times its thickness.

1.10.11 The conductors shall be transposed at sufficient intervals in order to minimize eddy currents and equalize the distribution of currents and temperatures along the windings.

1.10.12 Core and winding shall be capable of withstanding the shock during transport, installation and service. Adequate provision shall be made to prevent movement of core and winding relative to tank during these conditions.

1.10.13 Coil clamping rings, if provided, shall be of steel or of suitable insulating material. Axial laminated material other than bakelite paper shall not be used.

1.10.14 All threaded connections shall be provided with locking facilities. All leads from the winding to terminal board & bushings shall be rigidly supported to prevent injury from vibration. Guide tubes shall be used where practicable.

1.10.15 The Tertiary winding shall be designed to withstand mechanical and thermal stresses due to dead short circuit on its terminals.

1.10.16 The tertiary winding shall be suitable for connection to LT Transformer for auxiliary supply.

1.10.17 The transformer shall be designed to withstand a DC current of 10A per phase without injurious heating, noise and vibration.

1.10.18 **Current carrying connections**

1.10.19 The mating faces of bolted connections shall be appropriately finished and prepared for achieving good long lasting, electrically stable and effective contacts. All lugs for crimping shall be of the correct size for the conductors. Connections shall be carefully designed to limit hot spots due to circulating eddy currents.

1.10.20 **Winding terminations into bushings**

Winding termination interfaces with bushings shall be designed to allow for repeatable and safe connection under site conditions to ensure the integrity of the transformer in service.
The winding end termination, insulation system and transport fixings shall be so
designed that the integrity of the insulation system generally remains intact
during repeated work in this area.

Allowances shall be made on the winding ends for accommodating tolerances
on the axial dimensions of the set of bushings and also for the fact that bushings
may have to be rotated to get oil level inspection gauges to face in a direction
for ease of inspection from ground level.

In particular, rotation or straining of insulated connections shall be avoided
during the fastening of conductor pads (or other methods) on the winding ends
onto the termination surfaces of the bushing.

Suitable inspection and access facilities into the tank in the bushing oil-end area
shall be provided to minimize the possibility of creating faults during the
installation of bushings.

1.10.21 Particles in the oil

The particle analysis shall be carried out in an oil sample taken after completion
of the oil filtration at site. The procedure and interpretation shall be in
accordance with the recommendation of CIGRE report WG-12.17 - “Effect of
particles on transformer dielectric strength”.

1.10.22 Moisture content in the solid insulation

Dummy insulation test block (2 Nos.) shall be inserted in the active part of
Transformer at factory and same shall be used to detect the volume of moisture
content. Manufacturer to ensure that moisture content in the dummy insulation
test block is less than 0.5% after drying process of solid insulation. Out of two
dummy blocks, one block shall be used during manufacturing stage and another
one shall be sent with Transformer at site. Before application of vacuum and oil
filling, the 2nd dummy block shall be used for DP Test (Degree of
polymerisation).

To review the moisture content in the active part insulation at site during
erection, Dew Point method shall be applied.

1.11 TEMPERATURE INDICATING DEVICES

1.11.1 Oil Temperature Indicator (OTI):

All transformers shall be provided with a 150 mm dial type thermometer for top
oil temperature indication. The thermometer shall have adjustable, electrically
independent ungrounded alarm and trip contacts, maximum reading pointer and
resetting device shall be provided in the OTI. 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. Temperature indicator dials shall have
linear gradations to clearly read at least every 2 deg C. Accuracy of OTI shall be
± 3 deg C or better for a temperature of 100 deg C. The setting of alarm and
tripping contacts shall be adjustable at site.
The setting of alarm and tripping contacts shall be adjustable at site which will be reviewed during detailed engineering based on manufacturer’s recommendation.

In addition to the above, the following equipment shall be provided for remote indication of oil temperature:

**Temperature transducer with Pt100 sensor:**

RTD shall be provided with PT100 temperature sensor having nominal resistance of 100 ohms at zero degree centigrade. The PT100 temperature sensor shall have three wire ungrounded system. The calibration shall be as per IEC 60751-2 or equivalent. The PT100 sensor may be placed in the pocket containing temperature sensing element. RTD shall include image coil for OTI system and shall provide dual output 4-20mA for SCADA system. The transducer shall be installed in the Individual Marshalling Box. Any special cable required for shielding purpose, for connection between PT100 temperature sensor and transducer, shall be in the scope of Contractor. 4-20mA signal shall be wired to Digital RTCC panel / BCU for further transfer data to SCADA through IEC 61850 compliant communications.

1.11.2 **Winding Temperature Indicator (WTI)**

In the case of two winding transformers, winding temperature indicator shall be provided on LV side only and in case of three winding transformers winding temperature indicators shall be provided separately on all the three windings. It shall comprise the following:

i) Temperature Sensing element

ii) Thermal Image coil

iii) Auxiliary CTs, if required to match the image coil, shall be furnished and mounted in the cooler control cabinet.

iv) 150 mm dia local indicating instrument with maximum reading pointer and two adjustable electrically independent, ungrounded contacts; besides that required for control of cooling equipment if any, one for high winding temperature alarm and one for trip.

Temperature indicator dials shall have linear gradations to clearly read at least every 20°C. Accuracy of WTI shall be ± 3 deg C or better.


vi) In addition to the above, the following equipment shall be provided for remote indication of winding temperature for each of the winding:

**Temperature transducer with Pt100 sensor for each winding**

RTD shall be provided with Pt100 temperature sensor having nominal resistance of 100 ohms at zero degrees centigrade. The Pt100 temperature sensor shall have three wire ungrounded system. The calibration shall be as per IEC 60751-2 or equivalent. The Pt100 sensor may be placed in the pocket containing temperature sensing element. RTD shall include image coil, Auxiliary CTs, if required to match the image coil, for WTI system and shall provide dual output 4-20mA for remote WTI and SCADA system individually. The transducer, Auxiliary CT shall be installed in the Individual Marshalling Box. Any special cable required for shielding purpose, for connection between Pt100 temperature sensor and transducer, shall be in the scope of Contractor. 4-20mA signal shall be wired to
Digital RTCC / BCU panel for further transfer data to SCADA through IEC 61850 compliant communications.

1.11.3 The tripping contacts of winding temperature indicators shall be adjustable to close between 60°C and 120°C and alarm contacts to close between 50°C and 100°C and both shall re-open when the temperature has fallen by about 100°C.

1.11.4 The contacts used to control the cooling plant motors on the above devices shall be adjustable to close between 50°C and 100°C and to re-open when the temperature has fallen by 20°C.

1.11.5 All contacts shall be adjustable on a scale and shall be accessible on removal of the cover.

1.11.6 The temperature indicators (OTI & WTI) shall be so mounted that the dials are about 1200 mm from ground level. Glazed door of suitable size shall be provided for convenience of reading.

1.11.7 Connections shall be brought from the temperature indicators to terminals placed inside the marshalling box.

1.11.8 Cooler failure and oil flow alarm indication shall also be provided at local and remote end.

1.12 ANTI-EARTHQUAKE CLAMPING DEVICE

To prevent transformer movement during earthquake a clamping device should be provided for fixing the transformer to the foundation. The tenderer shall supply necessary bolts for embedding in the concreting.

1.13 INSULATING OIL

1.13.1 The insulating oil shall conform to the requirement of IS:335, IS:1448 IS:6103, IS:6104, IS:6792, IS:6262, IS:2362 & IS:1866. No inhibitors shall be used in the oil.

1.13.2 The necessary first filling of oil along with 10% extra oil for topping up shall be supplied, in non-returnable containers suitable for outdoor storage.

1.13.3 In case the manufacture dispatches the transformer completely filled with oil, free from air pockets, a specific relaxation may be requested.

1.14 OIL PRESERVATION EQUIPMENT

Tenderer can offer diaphragm type oil sealing in conservator to prevent oxidation and contamination of oil due to contact with moisture/air.

1.14.1 Dehydrating Silicagel Filter Breather

Conservator of Main Tank and OLTC shall be fitted with a dehydrating silicagel filter breather. Connection shall be made to a point in the oil conservator not less than 50 mm above the maximum working oil level by means of a pipe with a
minimum diameter of 25 mm. Breathers and connecting pipes shall be securely clamped and supported to the transformer, or other structure supplied by the contractor, in such a manner so as to eliminate undesirable vibration and noise. The design shall be such that:

a) Passage of air is through a dust filter and silica-gel.
b) Silica-gel is isolated from atmosphere by an oil seal.
c) Moisture absorption indicated by a change in colour of the tinted crystals can be easily observed from a distance.
d) Breather is mounted not more than 1200mm above rail top level.
e) To minimise the ingress of moisture three breathers (of identical size) shall be connected in series for main tank conservator. Contractor shall provide flexible connection pipes to be used during replacement of any silicagel breather.
f) To minimise the ingress of moisture, two in series of identical size shall be connected to OLTC Conservator. Contractor shall provide flexible connection pipes to be used during replacement of any silicagel breather.

1.15 BUSHING INSULATORS AND TERMINALS

1.15.1 The electrical and mechanical characteristics of bushings shall be in accordance with latest provisions of IS: 2099/ IS: 3347/IEC60137.

Bushings shall be robust and designed for adequate cantilever strength to meet the requirement of seismic condition, substation layout and movement along with the spare Transformer with bushing erected and provided with proper support from one foundation to another foundation within the substation area. The electrical and mechanical characteristics of bushings shall be in accordance with IEC: 60137/DIN 42530. All details of the bushing shall be submitted for approval during detailed engineering.

1.15.2 Bushing terminals shall be provided with terminal connectors of approved type and size for connections of external parts. Details shall be got approved before manufacture. The flexible bimetallic terminal connectors with laminated contacts at the bushings shall be designed to withstand the electrical and mechanical stresses, arising out of temperature variations and fault conditions. The terminal connectors shall conform to IS: 5561 and relevant IEC and also to clause 3.13 & 5.13 of section-III & V respectively of this specification.

1.15.3 No arching horns/rod gaps shall be provided on the Transformer bushings.

1.15.4 Bushing for voltage of 66 kV & above level shall be hermetically sealed Resin Impregnated Paper (RIP) with polymer. 36 kV bushing shall be solid porcelain or oil communicating type. Mounting dimensions of 245 kV bushing shall be as per drawing finalized with employer. Dimensions of 36 kV bushing shall conform to IS: 3347 Part-V.

1.15.5 RIP type bushing shall be provided with tap for capacitance and tan delta test. Test taps relying on pressure contacts against the outer earth layer of the bushing is not acceptable.
1.15.6 When bushings have an under-oil end of re-entrant form, the associated pull through lead shall be fitted with a gas bubble deflector.

1.15.7 Clamps for fittings of iron and steel shall be hot dip galvanized/stainless steel as per IS:2633 and relevant IEC.

1.15.8 The creep age distance of the bushing shall in no case be less than 31 mm / KV, suitable for heavily polluted atmosphere.

1.15.9 Bushing turrets shall be provided with vent pipes, to route any gas collection through the Buchholz relay.

1.15.10 No arcing horns shall be provided on the bushings.

1.15.11 RIP Bushing shall be specially packed to avoid any damage during transit and suitable for long storage, with non-returnable packing wooden boxes with hinged type cover. Without any gap between wooden planks. Packing Box opening cover with nails/screws type packing arrangement shall not be acceptable. Bushing oil end portion shall be fitted with metal housing with positive dry air pressure and a suitable pressure monitoring device shall be fitted on the metal housing during storage to avoid direct contact with moisture with epoxy. Alternatively, oil filled metal housing with suitable arrangement for taking care oil expansion due to temperature variations shall also be acceptable. Manufacturer shall submit drawing/ documents of packing for approval during detail engineering. Detail method for storage of bushing including accessories shall be brought out in the instruction manual.

1.15.12 The terminal marking and their physical position shall be as per IEC: 60076.

1.15.13 Tan delta measurement at variable frequency (in the range of 20 Hz to 350 Hz) shall be carried out on each condenser type bushing (RIP) at Transformer manufacturing works as routine test before dispatch and the result shall be compared at site during commissioning to verify the healthiness of the bushing.

1.15.14 If the bushing Tan delta goes beyond 0.005 or increase is more than 0.001 within the warrantee period w.r.t. pre-commissioning values, the contractor shall arrange to replace the defective bushing by new one. No temperature correction factor shall be applicable for tan delta.

1.15.15 Tenderer shall provide details of Bushing CT's at the time of detailed engineering.

1.15.16 **Bushing details are as under:**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Bushing</th>
<th>HV</th>
<th>IV</th>
<th>LV</th>
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<tbody>
<tr>
<td>i.</td>
<td>Rated Voltage (kV)</td>
<td>245</td>
<td>72.5/36</td>
<td>36</td>
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<tr>
<td>ii.</td>
<td>Rated current (Amp.)</td>
<td>800</td>
<td>3150</td>
<td>3150</td>
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### iii. 1.2/50 micro sec. lightning impulse withstand voltage (kVp)
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<td></td>
<td>1050</td>
<td>325/170</td>
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### iv. 250/2500 micro sec. Switching impulse withstand voltage (kVp.)
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### v. One minute power frequency withstand voltage kV (rms.)
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<tr>
<td></td>
<td>460</td>
<td>140/70</td>
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### vi. Minimum total creepage distances (mm)
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<tr>
<td></td>
<td>31 mm/kV</td>
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</table>

### 1.16 PROTECTIVE DEVICES

The protective relaying of the power transformer shall be as under:-

a) Pressure relief valve for the main tank.
b) Buchholz Protection for main tank.
c) Sudden pressure relay for the main tank.
d) Surge relay for OLTC tank conservator.
e) Thermal Protection (Oil and windings with high temp.).
f) Tap changer out of step trip.

### 1.17 TERMINAL MARKING

The terminal marking and their physical position shall be in accordance with IEC-60076/IS: 2026.

### 1.18 NEUTRAL EARTHING ARRANGEMENT

The neutral terminal of transformer shall be connected to Neutral Current Transformer through brass/tinned copper bar and then brought to the ground level by a G.S. Flat, supported from the tank by using porcelain insulators. The end of the G.S. Flat shall be brought to the bottom of the tank, at a convenient point, for making bolted connection to two (2) 75x12 mm galvanized steel flats connected to purchaser’s ground grounding mat.

### 1.19 ON-LOAD TAP-CHANGING MECHANISM (O.L.T.C.)

1.19.1 Each transformer shall be provided with an on-load tap changing mechanism. This shall be designed suitable for remote control operation from switch boards in the control room in addition to being capable of local manual as well as local electrical operation.

1.19.2 It shall not be possible to use the electric drive when manual gear is in use and it shall be possible to use only one electrical control at a time. Operation of the local or remote control switches shall cause one tap movement only until the control switch is returned to the off position for the next operation.
1.19.3 The local electrical control switches shall be mounted in the outdoor cubicle.

1.19.4 The equipment shall be so arranged as to ensure that when a tap change operation has been commenced it shall be completed independently of the operation of the control relays and switches. If a failure of the auxiliary supply during a tap change or any other contingency result in that movement not being completed, adequate means shall be provided to safeguard the transformer and its auxiliary equipment from damage. Supervisory indication shall be provided to indicate “The change incomplete” foul.

1.19.5 Limit switches may be connected in the control circuit of the operation motor provided that a mechanical de-clutching mechanism is incorporated. Otherwise it shall be directly connected to the operating motor circuit and mechanical stop provided.

1.19.6 Thermal devices or other means shall be provided to protect the motor and control circuits. All relays switches, fuses etc. shall be mounted in the marshalling box and shall be clearly marked to indicate their purpose.

1.19.7 The control circuit shall operate at 110 V 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.

1.19.8 The whole of the apparatus shall be of robust design and capable of giving satisfactory service without undue maintenance under the conditions to be met in service, including frequent operation.

1.19.9 A five-digit counter shall be fitted to the tap changing mechanism to indicate the number of operations completed by the equipment.

1.19.10 A permanently legible lubrication chart shall be fitted within the driving mechanism chamber.

1.19.11 The ON-LOAD Tap Changer shall include the following :-
   a) An oil immersed tap selector and arcing switch or arc-suppressing tap selector, provided with resistor for reduction of make and break arcing voltage, overload and short circuits.
   b) Motor driven mechanism.
   c) Control and Protection devices.
   d) Local and remote tap-changer position indicator.
   e) Manual operating device.

1.19.12 The on-load tap changer shall be designed so that the contacts shall not interrupt arc within the main tank of the transformer. The tap selector and arcing switch or arc suppressing tap selector switch shall be located in one oil filled compartment. The compartment shall be provided with a means of releasing the gas produced by the arcing. It shall be designed so as to prevent the oil in the tap selector compartment from mixing with the oil in the transformer tank.

1.19.13 The oil in those compartments of the main tap-changing apparatus which do not contain contacts used for making or breaking current shall be maintained
under conservator head by means of an adequate diameter pipe corresponding
dia of OLTC oil surge relays connection from the highest point of the chamber
connection corresponding to the dia. of OLTC oil surge relay from the highest
point of the chamber to the conservator. This connection shall be controlled by
a suitable valve and shall be arranged so that any gas leaving the chamber will
pass into the gas and oil actuated relay.

1.19.14 The tap changer shall be capable of permitting parallel operation with other
transformers for which necessary wiring and accessories, if any, shall be
provided.

1.19.15 The centre of manual operating device shall be located at a height of 1000 mm
from rail top so that it can be operated by a person standing at the ground
level. The arrangement shall be strong and robust in construction. The
transformer shall give full load output on all tap positions.

1.19.16 The control scheme for the tap changer shall be provided for independent
control of the tap changers when the transformers are in independent service.
In addition, provision shall be made to enable parallel operation control also at
time so that the tap changer will be operated simultaneously when one unit is
in parallel with another will not become out of step and this will eliminate
circulating current.

Additional features like Master / Follower and visual indication during the
operation of motor shall also be incorporated.

1.19.17 Necessary interlock, blocking independent control when the units are in
parallel, shall be provided.

1.19.18 Under abnormal conditions such as may occur if the contactor controlling one
tap changer sticks, the arrangement must be such as to switch off supply to the
motor so that an out of step condition is limited to one tap difference between
the units. Details of out of step protection provided for the taps should be
furnished in the bid.

1.19.19 The contactor and associated gear for the tap change driving motors shall be
housed in a local kiosk mounted adjacent to the transformer. The motors shall
be suitable for operation on 230 V single phase or 3-phase 440 V, 50 cycle
external power supply. The kiosk having space heater, shall be dust and
vermin proof and suitable protected against corrosion or deterioration due to
condensation, fungi etc.

1.19.20 The supplier shall furnish, in addition to the above equipment, one indoor
cubicle (RTCC panel) for installation in the purchaser’s control room which
shall contain :
   a) Indication of the transformer ratio in use on each transformer and the
      number designating the tap in use by means of digital type indicators.
   b) Raise and lower push Button switch and AVR Relay.
   c) Independent/Master/Follower selector switch.
   d) Remote tap position indicator with indicating lamp.
e) Repeater dial of winding temperature indicator for remote indication with a device for indicating hottest spot winding temperature in addition to a pointer to register the highest temperature reached.

f) An indication lamp showing tap change in progress.

g) Necessary audible and visual alarms.

h) Pressure relief device operation alarm.

i) Out of step relay with two spare contacts (2 NC and 2 NO).

j) The remote indoor cubicle in addition to the above indications shall also have the following trip and non-trip alarm windows facias with 5 spare windows suitable for 220V DC supply.

i) Oil Temperature alarm

ii) Winding Temperature alarm

iii) Winding temperature trip

iv) Buchholz alarm

v) Buchholz trip

vi) Sudden Pressure trip (Main tank)

vii) Surge Relay trip (OLTC Gear)

viii) Tap changer out of step alarm

ix) Low oil level alarm

x) Cooling fans working indication

xi) Oil pumps on and off indication

xii) Failure of group of fans alarm

xiii) Failure of group of oil pumps alarm

xiv) Failure of supply

xv) Oil flow alarm

Each relay for tripping function shall have two normally open and two normally closed contacts for connection.

1.19.21 The OLTC shall be provided on the conservator side of the Power Transformer and not in front of H.V. Bushings.

1.19.22 OLTC shall be suitable for bi-directional power flow.

1.20 COOLING EQUIPMENT

1.20.1 Cooling fans for each radiator bank shall be housed in fan box to prevent ingress of rain water. Each fan shall be suitably protected by galvanized wire mesh guard. It shall be possible to remove the cooling fan with motors without disturbing and dismantling the cooler structural frame work.

1.20.2 Where OFAF cooling is applicable, two numbers of centrifugal oil pumps shall be used. Measures shall be taken to prevent mal-operation of Buchholz relay or sudden pressure relay when all oil pumps are simultaneously put into service. The pumps shall be so designed that on failure of power supply to the pump motor, the pump impeller will not limit the natural circulation of oil.

1.20.3 Cooling fans and oil pump motors shall be of squirrel cage, totally enclosed weather proof type suitable for operation on 400 volts, three phase, 50 Hz power supply. All motors having ball and roller bearings and grease lubricators shall be fitted with hexagonal nipples conforming to relevant Indian Standard.
1.20.4 An oil flow indicator with alarm contacts shall be provided for the confirmation of the oil pump operating in a normal state. An indication shall be provided on the control panel to indicate that the pump is running.

1.20.5 The coolers and their accessories shall be hot dip galvanized or corrosive resistant painted.

1.20.6 The supporting arrangement for the cooler units or for radiator banks shall be in such a manner that the stresses if developed, shall not be transferred to the flanges of the butterfly valves.

1.20.7 The shut off valves shall be provided on the tank at each point of connection of cooler units radiators to the transformer tank. Removable blanking plates shall be provided to permit blanking off the oil connection to cooler radiators.

1.20.8 All valves shall be of gun metal or cast steel or may have cast iron bodies with gun metal fittings. They shall be of full way type with internal screw and shall be opened by turning counter clock-wise when facing the hand wheel.

1.20.9 Means shall be provided for pad locking of valves in the open and closed position.

1.20.10 Every valve shall be provided with indicator to show clearly the position of the valve whether open or closed.

1.20.11 All valves shall be provided with flanges having machined faces.

1.20.12 The drilling of valve flanges shall comply with the requirements of IS:3639.

1.20.13 Cooling Equipment and its Control

1.20.13.1 Cooling Equipment for Radiator Bank

1.20.13.2 The cooler shall be designed using radiator banks. Design of cooling system shall satisfy the performance requirements.

1.20.13.3 In separately mounted radiator bank arrangement, the main tank shall have provision such that cooler banks can be placed on either side of the main tank without the need of any extra member/pipe maintaining the electrical clearances.

1.20.13.4 The radiator shall be of sheet steel in accordance with IS 513 and minimum thickness 1 mm. Each radiator bank shall be provided with the following accessories:

(a) Cooling Fans, Oil Pumps, Oil Flow Indicator (as applicable)
(b) Top and bottom shut off valve
(c) Drain Valve and sampling valve
(d) Top and bottom oil filling valves
(e) Air release plug
(f) Two grounding terminals for termination of two (2) Nos. 75x12 mm galvanized steel flats.
(g) Thermometer pockets with captive screw caps at cooler inlet and outlet.
1.20.13.4 Each radiator bank shall be detachable and shall be provided with flanged inlet and outlet branches. Expansion joint shall be provided on top and bottom cooler pipe connection test.

1.20.13.5 One number standby fan shall be provided with each radiator bank.

1.20.13.6 Cooling fans shall not be directly mounted on radiator. It may cause undue vibration. These shall be located so as to prevent ingress of rain water. Each fan shall be suitably protected by galvanized wire guard. The exhaust air flow from cooling fan shall not be directed towards the main tank in any case.

1.20.13.7 Two (2), 100% centrifugal or axial in line oil pumps, if applicable, (out of which one pump shall be standby) shall be provided with each radiator bank. Measures shall be taken to prevent mal-operation of Buchholz relay when all oil pumps are simultaneously put into service. The pump shall be so designed that upon failure of power supply to the pump motor, the pump impeller will not limit the natural circulation of oil.

1.20.13.8 An oil flow indicator shall be provided for the confirmation of the oil pump operating in a normal state. An indication in the flow indicator and potential free contacts for remote alarm shall be provided.

1.20.13.9 Valves shall be provided across the pump and oil flow indicator to avoid oil drain and long outage during maintenance / replacement of pump and oil flow indicator.

1.20.13.10 Cooling fans and oil pump motors shall be suitable for operation from 415 volts, three phase 50 Hz power supply and shall conform to IS: 325 / IEC 60034. Each cooling fan and oil pump motors shall be provided with starter thermal overload and short circuit protection. The motor winding insulation shall be conventional class 'B' type. Motors shall have hose proof enclosure equivalent to IP: 55 as per IS: 4691/ IEC 60034-5.

1.20.13.11 The cooler pipes, support structure including radiators and its accessories shall be hot dip galvanized or corrosion resistant paint should be applied to external surface of it.

1.20.13.12 Air release device and oil plug shall be provided on oil pipe connections. Drain valves shall be provided in order that each section of pipe work can be drained independently.

1.21 CONTROL OF COOLER OPERATION

1.21.1 Each motor or group of motors shall be provided with an electrically operated contactor and with control gear of suitable design both for starting and stopping the motor manually and also automatically from the contacts on the winding temperature indicating device as specified. Additional terminal for remote manual electrical control of motors shall be provided. Overload and single phasing protection shall be provided. MCBs shall be provided for short
circuit protection. This equipment shall be accommodated in the marshalling box. The power supply shall be provided with adequate capacity MCBs.

1.21.2 Where small motors are connected in groups, the group protection shall be arranged so that it operates satisfactorily in the event of a fault occurring on a single motor.

1.21.3 Where fans and oil pumps are provided, the connection shall be arranged as to allow the motors or groups of motors to be started up and shutdown either collectively or individually.

1.21.4 All motor contactors and their associated apparatus shall be capable of holding in and operating satisfactorily and without over heating for a period of ten minutes if the supply voltage falls for that period, to 75% of normal value and at normal frequency. The motor contactors and associated apparatus shall be capable of normal operation with a supply voltage of 85% of the normal value and at normal frequency.

1.21.5 All contacts and other parts which may require renewal, adjustment or inspection shall be readily accessible.

1.21.6 The control arrangements are to be so designed as to prevent the simultaneous starting of motors of total rating of more than 20 HP where such an eventually may arise, two step operation shall be preferred.

1.21.7 Alarm indication for failure of group of fans and oil pump shall be provided.

1.21.8 Alarm indication shall be provided to indicate failure of power supply.

1.21.9 Provision in the cooler control circuit may be made such that tripping of transformer breaker on Differential or Sudden Pressure should lead to supply disconnection to motor of the cooler pump.

1.22 Digital RTCC Panel

1.22.1. The digital RTCC relay shall have Automatic Tap Changer control and monitoring relay with Automatic Voltage Regulating features (referred as Digital RTCC relay) to remotely control and monitor OLTC.

1.22.2. The contractor shall provide Digital RTCC panel consisting of Digital RTCC relays. Each digital RTCC relay shall be used to control individual transformer.

However, bidders are advised to get clarified about the availability of existing RTCC schemes /Digital RTCC relays to finalise matching digital RTCC relays requirements in existing substation. The Digital RTCC relays envisaged for existing transformers shall be integrated for parallel operations. All required cables for the same shall be included in the scope.

1.22.3. Digital RTCC relay shall be microprocessor based adopting the latest state of the art design & technology with in-built large display for ease of programming and viewing. The unit supplied shall be field programmable so that in the event of change in transformer / location, it could be customized to site conditions.
without sending back to works. The programming shall be menu driven and easily configurable. If it is designed with draw out type modules, it should take care of shorting all CT inputs automatically while drawing out. The CT / VT ratio shall be field programmable and Relay shall display the actual HV Voltage and current considering suitable multiplying factors. The system shall be self-sufficient and shall not require any additional devices like parallel balancing module etc.

All Digital RTCC Relays shall be of same make for smooth integration of these relays for parallel operations of all transformers in the substation.

1.22.4. The RTCC Panel shall be provided with digital RTCC relay having Raise/Lower push buttons, Manual/ Automatic mode selection features, Master / Follower/ Independent/ Off mode selection features for control of OLTC. Touch screen option in the relay, instead of electrical push button/switch is also acceptable.

1.22.5. In Manual Mode: In this mode, power system voltage based automatic control from digital RTCC relay shall be blocked and commands shall be executed manually by raise/lower push buttons.

1.22.6. In Auto Mode: In Auto mode, digital RTCC relay shall automatically control OLTC taps based on power system voltage and voltage set points. An interlock shall be provided to cut off electrical control automatically upon recourse being taken to the manual control in emergency.

1.22.7. **Master / Follower/ Independent/ Off mode**

Master / Follower parallel operation is required with Group simultaneous feature in Digital RTCC relay. Master-follower scheme implies that controlled decision shall be taken by the Master and control actions (Raise/Lower tap position) shall be executed simultaneously by Master & Follower units. Same logic needs to be implemented in digital RTCC relays.

Master Position: If the digital RTCC relay is in master position, it shall be possible to control the OLTC units of other parallel operating transformers in the follower mode by operation from the master unit.

Follower Position: If the digital RTCC relay is in Follower position, control of OLTC shall be possible only from panel where master mode is selected.

Independent Position: In independent position of selector switch, control of OLTC shall be possible only from the panel where independent mode is selected.

Suitable interlock arrangement shall be provided to avoid unwanted/inconsistent operation of OLTC of the transformer

1.22.8. **Raise/Lower control:**

The remote OLTC scheme offered shall have provision to raise or lower taps.

1.22.9. Digital RTCC relays shall communicate with SCADA using IEC 61850 through FO port to monitor, parameterise & control the OLTC. Any software required for
this purpose shall be supplied. The supplied software shall not have restriction in loading on multiple computers for downloading and analyzing the data. Software shall indicate the current overview of all measured parameters of the connected transformer in real time. The digital RTCC Relay shall have multiple selectable set point voltages and it shall be possible to select these set points from SCADA, with a facility to have the possibility of additional set points command from SCADA.

Communication between the Digital RTCC relays to execute the commands for parallel operation shall be implemented using required communication protocol. IEC- 61850 GOOSE messaging between Digital RTCC relays for OLTC parallel operation is not permitted. Suitable communication hardware shall be provided to communicate up to distance of 1km between digital RTCC relays. Scope shall also include communication cables between digital RTCC relays. Cables as required for parallel operation of OLTCs of all transformers (including existing transformers wherever required) from Digital RTCC relays shall be considered included in the scope of bidder.

1.22.10. The Digital RTCC relay shall have additional programmable Binary Inputs (minimum 7 Nos.) and Binary outputs (minimum 7 Nos.) for purchaser’s future use. It shall be possible to have additional module for Binary Input / output as well as Analogue input module depending upon requirement.

1.22.11. The relays shall ensure positive completion of lowering/raising of the OLTC tap, once the command is issued from the relay. "Step-by-Step" operation shall be ensured so that only one tap change from each tap changing pulse shall be effected. If the command remains in the "operate" position, lock-out of the mechanism is to be ensured.

1.22.12. Following minimum indications/alarms shall be provided in Digital RTCC relay either through relay display panel or through relay LEDs:
   a. incomplete step alarm
   b. OLTC motor overload protection alarm
   c. Supply to DM Motor fail alarm
   d. OLTC in progress alarm
   e. Local / Remote Selector switch positions in DM Box
   f. OLTC upper/lower limits reached alarm
   g. OLTC Tap position indications for transformer units
   h. remote selector switch positions of MB
   i. 415V, AC Main Supply Fail.
   j. 415V, AC Standby Supply Fail

1.22.13. In case of parallel operation of Transformer OLTC out of step alarm shall be generated in the digital RTCC relay for discrepancy in the tap positions.

1.23 **SCADA Integration**

All the online monitoring equipment i.e. Optical Temperature Sensors & Measuring Unit, Online Dissolved Gas (Multi-gas) and Moisture Analyzer etc. provided for individual transformer unit including spare (if any), are IEC 61850 compliant (either directly or through a Gateway). This monitoring equipment is
required to be integrated with SAS through managed Ethernet switch conforming to IEC 61850. This Ethernet switch shall be provided in MB by the contractor. The switch shall be powered by redundant DC supply (110V or as per available Station DC supply). Ethernet switch shall be suitable for operation at ambient temperature of 50 Deg C. All required power & control cables including optical cable, patch chord (if any) up to MB shall be in the scope of contractor. All cable from RTCC to DM shall also be in the scope of contractor. Further, any special cable between MB to switchyard panel room/control room shall be in the scope of contractor.

However, fiber optic cable, power cable, control cables, as applicable, between MB to switchyard panel room/control room and power supply (AC & DC) to MB and integration of above said IEC-61850 compliant equipment with Substation Automation System shall be under the scope of sub-station contractor.

1.24 MARSHALLING BOX

1.24.1. A sheet steel, vermin, dust proof, galvanized, well ventilated and weather-proof marshalling box of a suitable construction shall be provided for the transformer ancillary apparatus. The box shall have domed or sloping roofs and the interior and exterior painting shall be in accordance with clause-1.26. Sheet thickness of the box shall not be less than 3.15mm and it shall be provided with lockable doors.

1.24.2. The marshalling box shall accommodate the following:
   a) Control and protection equipment for the local electrical control of tap changer.
   b) Control and protection equipment for the cooling plant.
   c) Terminal blocks and gland plates with electroplated brass glands for incoming and outgoing cables.

1.24.3. All the above equipments except (c) shall be mounted on panels and back of panel wiring shall be used for interconnection.

1.24.4. The temp indicators shall be so mounted on the body of the transformer at a height of 1200 mm above rail top level.

1.24.5. Terminal block shall be adequate and suitable to adopt at least 4 mm sq. control wires and loop connections. One piece moulded from non inflammable plastic material only with insulation barriers, stud type terminals, washers, nuts, lock nuts and identification strips. Separate studs shall be provided for incoming and outgoing wires. Making on the terminal strip shall correspond to the wire numbers on the wiring diagram.

   Wire termination shall be made with solderless crimping type tinned copper, lugs which firmly grip the conductor and insulation. Insulated sleeves shall be provided at all the wire terminations. Engraved core identification ferrules marked to correspond with panel wiring diagram shall be fitted at both ends of each wire.
Supplier shall indicate the no. and size of control cables terminating at the marshalling box.

1.24.6. To prevent internal condensation an approved type of metal clad space heater shall be provided, controlled by a suitable switch. Cubicle lighting with door switch and ventilation louvers shall be provided. MCB shall be provided for protection of space heater and light. Supply shall be 230 V single phase 50 Hz AC.

1.24.7. All incoming cables shall enter the cubical from the bottom and the gland plate shall be not less than 450 mm from the base of box. The gland plate and associated compartment shall be sealed in suitable manner to prevent the ingress of moisture from the cable trench. The marshalling box front and back shall be flushed with the ground level.

1.24.8. The degree of protection for Marshalling box shall be IP:55 in accordance with IS: 13947/ IEC : 60947 for outdoor equipment.

1.24.9. Drilled gland plate with proper blanking plates shall be provided for accommodating glands for incoming and outgoing cables. Sizes and number of glands to be provided shall correspond to the no. the control cables. Also the gland shall be suitable for earthing of armour.

1.24.10. Marshalling box should be separately floor mounted.

1.24.11. Marshalling box should have provision for two independent ac sources with auto changeover facility.

1.25 CONTROL CONNECTIONS AND INSTRUMENT WIRING TERMINAL BOARD AND FUSES:

1.25.1. All wiring connections, boards, fuses and links shall be suitable for tropical atmosphere. Any wiring liable to be in contact with oil shall have oil resisting insulation and the bared ends of standard wire shall be sweated together to prevent creepage of oil along the wire.

1.25.2. There shall be no possibility of oil entering connection boxes used for cables or wiring.

1.25.3. Panel connections shall be neatly and squarely fixed to the panel. All instruments and panels wiring shall be run in PVC cleats of the limited compression or in ‘C’ type channels. All wiring to a panel shall be taken from suitable terminal boards.

1.25.4. 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.

1.25.5. Danger plates wherever necessary shall be provided.
1.25.6. All box wiring shall be in accordance with the relevant IS. All wiring shall be of high grade PVC or polythene insulated stranded copper of 1100V grade and size not less than 2.5 sq.mm. The cables shall be suitable for tropical climate and shall be vermin and fire proof.

All wires shall be suitably terminated with ferruled numbers in accordance with the schematic and wiring diagram for ease of identification and tracing of faults.

1.25.7. All those paints of interconnection between the wiring carried out on control equipments, 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.

1.25.8. The same ferrule number shall not be used on wires in different circuits on the same panel.

1.25.9. Ferrules shall be of insulated 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 damp or oil.

1.25.10. Stranded wires shall be terminated with tinned Ross Countncy terminals, claw washers or crimped tubular lugs. Separate washers shall be used for each wire. The size of the washers shall be suitable 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 and name plates fixed for each type of circuits.

1.25.11. Wires shall not be jointed or tied between terminal points.

1.25.12. Wherever practicable, 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.

1.25.13. Where apparatus is mounted on panels all metal cases shall be separately earthed by means of copper wire or strip having a cross-section of not less than 2 sq.mm where strip is used, the joints shall be suitably ferruled and crimped.

1.25.14. All wiring diagram for control and relay panel shall preferably be drawn as viewed from the back and shall show the terminal boards arranged as in service. All diagrams shall show which view is employed.

1.25.15. Multicore cable tails shall be so bound that each wire may be traced without difficulty to its location.

1.25.16. The screens or screen pairs of multi-core cables shall be earthed at one end of the cable only. The position of earthing connections shall be shown clearly on the diagrams.
1.25.17. All terminal boards shall be mounted obliquely towards the rear door to give easy access to terminators and to enable ferrules numbers to be read without difficulty.

1.25.18. Terminal boards rows should be spaced not less than 100mm apart to permit convenient access to wires and terminations.

1.25.19. Terminal boards shall be so placed with respect to the cable gland (at a min. distance of 200 mm) as to permit satisfactory arrangement of multicore cable tails.

1.25.20. Terminal boards 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.

1.25.21. No live metal shall be exposed at the back of the terminal boards.

1.25.22. All fuses shall be of the cartridge type.

1.25.23. Fuses and links shall be labeled.

1.26 CLEANING AND PAINTING

1.26.1 Before painting or filling with oil or compound all un-galvanised parts shall be completely cleaned and freed from rust, scale and grease by pickling, degreasing process and all external surface cavities on castings shall be filled by metal deposition.

1.26.2 The interior of all transformer tanks and other oil filled chambers and internal structural steel works shall be cleaned of all scale and rust by shot blasting or other approved method. These surfaces shall be spray painted with hot oil resisting varnish or paint. Unexposed welds need not be painted.

1.26.3 Except for nuts, bolts and washers, which may have to be removed for maintenance purposes, all external surfaces shall receive a minimum of three coats of spray paint.

1.26.4 The primary coat shall be applied immediately after cleaning. The second coat shall be of an oil and weather resisting nature and preferably of a shade or colour easily distinguishable from the primary and final coats and shall be applied after the primary coat has been touched up where necessary. The final coat shall be of a glossy oil and whether resisting non-fading paint of shade No. 631 of IS:5. Primer paint shall be ready make zinc chrome as per IS:104; intermediate and final coats of paint shall be as per IS:2932.

1.26.5 Nuts, bolts and washers which may have to be removed for maintenance purposes shall receive a minimum of one coat of paint after erection.

1.26.6 All interior surfaces of mechanism chambers and kiosks except those which have receive anticorrosion – treatment shall receive three coats of paint
applied to the thoroughly cleaned metal surface. The final coat shall be of an approved light coloured anti-condensation mixture.

1.26.7 Any damage to paint work incurred during transport and erection shall be made good by the supplier by thoroughly cleaning the damaged portion and applying the full number of coats of paint that had been applied before the damage was caused.

1.26.8 One coat of additional paint shall be given at site to the purchase. Supplier will also supply the requisite quantity of paint.

1.26.9 Cubical and marshalling kiosk sheets shall be phosphated before application of enamel paint.

1.27 **BOLTS AND NUTS**

1.27.1 Steel bolts and nuts exposed to atmosphere shall have suitable finishers like cadmium plated or zinc plated for diameters above 6mm.

1.27.2 All nuts/bolts and pins shall be locked in position with the exception of those external to the transformer.

1.27.3 On outdoor equipments all bolts, nuts and washers in contact with non-ferrous parts, which a carry curt shall be phosphor-bronze, where transfer of current is through the bolts.

1.27.4 If bolts and nuts are placed so that they are inaccessible by means of ordinary spanners, suitable special spanners shall be provided by the supplier.

1.28 **PACKING**

The packing shall be in accordance with the tenderer’s standard practice but he shall give full particulars of packing for the approval of the Employer. All parts shall be adequately marked to facilitate field erection. Boxes and crates shall be marked with the contract number and shall have a packing list enclosed showing the parts contained therein.

1.29 **LABELLING**

The transformer shall be labeled with the name of the substation where proposed to be installed. The label plate shall be fixed adjoining the name and plate and shall be of similar design so as to match with the name plate. The transformer should only be dispatched with the name plate and the labeling plate indicating the name of the substation thereon. The name plate shall be provided as per IS 2026. Beside this name plate shall also indicate information regarding weight of copper, weight of CRGO or other iron parts and weight of insulation shall also be provided in the name plate.

1.30.0. **Transportation**

1.30.1. The Contractor shall dispatch the transformer filled with oil or in an atmosphere of nitrogen at positive pressure. In the former case, the contractor shall take care of
the weight limitation on transport and handling facility at site. In the latter case, necessary arrangement shall be ensured by the contractor to take care of pressure drop of nitrogen during transit and storage till completion of oil filling during erection. The nitrogen cylinder provided to maintain positive pressure can be taken back by the contractor after oil filling. A gas pressure testing valve with necessary pressure gauge and adaptor valve shall be provided.

Transformer shall also be fitted with at least one Electronic impact recorder (on returnable basis) during transportation to measure the magnitude and duration of the impact in all three directions. The acceptance criteria and limits of impact in all three directions which can be withstood by the equipment during transportation and handling shall be submitted by the contractor during detailed engineering. The recording shall commence in the factory before dispatch and must continue till the unit is installed on its foundation. The data of electronic impact recorder(s) shall be downloaded at site and a soft copy of it shall be handed over to Engineer-in-charge. Further, within three weeks the contractor shall communicate the interpretation of the data. In the unlikely event of impact recorder output not available at site, the equipment shall be thoroughly internally inspected by the manufacturer’s representative before erection at site to ensure healthiness of the equipment. Contractor shall mount Vehicle tracking system (GPRS/ GPS/ GSM based) to track the exact position of the vehicle on which the transformer is being loaded for transportation and during detailed engineering take approval for the equipment installed.

1.30.2. The Contractor shall be responsible to select and verify the route, mode of transportation and make all necessary arrangement with the appropriate authorities for the transportation of the equipment. The dimension of the equipment shall be such that when packed for transportation, it will comply with the requirements of loading and clearance restrictions for the selected route. It shall be the responsibility of the contractor to coordinate the arrangement for transportation of the transformer for all the stages from the manufacturer’s work to site.

1.30.3. The contractor shall carry out the route survey along with the transporter and finalise the detail methodology for transportation of transformer and based on route survey; any modification/ extension/ improvement to existing road, bridges, culverts etc. if required, shall be in the scope of the contractor.

1.30.4. The inland transportation of the Transformer shall be on trailers equipped with GPS system for tracking the location of transformer at all times during transportation from manufacturer works to designated site. The contractor shall intimate to Employer about the details of transporter engaged for transportation of the Transformer for tracking the Transformer during transit. Requirement of Hydraulic trailer is envisaged for 220kV or above voltage class Transformers.

1.30.5. All metal blanking plates and covers which are specifically required to transport and storage of the transformer shall be considered part of the transformer and handed over to the Purchaser after completion of the erection. Bill of quantity of these items shall be included in the relevant drawing/document.

1.30.6. The Contractor shall dispatch the transformer filled with dry air at positive pressure. The necessary arrangement shall be ensured by the contractor to take
care of pressure drop of dry air during transit and storage till completion of oil filling during erection. A dry air pressure testing valve with necessary pressure gauge and adaptor valve shall be provided. Generally, the duration of the storage of transformer at site with dry air, shall preferably be limited to three months, after which the Transformer shall be processed as per the recommendation of manufacturer if not filled with oil. The dry air cylinder(s) provided to maintain positive pressure can be taken back by the contractor after oil filling.

1.30.7. In case turret, having insulation assembly, is transported separately then positive dry air pressure shall be ensured.

1.30.8. Transformer shall also be fitted with Electronic impact recorders (on returnable basis) at least 2 numbers for 400kV Class Transformer and 1 number for below 400kV class Transformers during transportation to measure the magnitude and duration of the impact in all three directions. The mounting location of impact recorder shall be finalized during detailed engineering. The acceptance criteria and limits of impact, which can be withstood by the equipment during transportation and handling in all three directions, shall not exceed “3g” for 50mSec (20Hz) or as per contractor standard, whichever is lower.
SECTION – II: INSPECTION AND TESTING

2.0 INSPECTION AND TESTING

The Contractor shall carry out a comprehensive inspection and testing programme during manufacture of the equipment. An indication of inspection envisaged by the Employer is given under Clause 2.1. 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 in the form of detailed quality plan duly approved by Employer for necessary implementation.

2.1.0. Inspection

2.1.1. Tank and Conservator

2.1.1.1 Certification of chemical analysis and material tests of plates.

2.1.1.2 Check for fitness.

2.1.1.3 Electrical interconnection of top and bottom by braided tinned copper flexible.

2.1.1.4 Welder’s qualification and weld procedure.

2.1.1.5 Testing of electrodes for quality of base materials and coatings.

2.1.1.6 Inspection of major weld preparation.

2.1.1.7 Crack detection of major strength weld seams by dye penetration test.

2.1.1.8 Measurement of film thickness of:
   i) Oil insoluble varnish.
   ii) Zinc chromate paint.
   iii) Finished coat.

2.1.1.9 Check correct dimensions between wheels; demonstrate turning of wheels through 90° and further dimensional check.

2.1.1.10 Check for physical properties of materials for lifting lugs, jacking pads, etc. All load bearing welds including lifting lug welds shall be subjected to Non Destructive Testing (NDT).

2.1.1.11 Leakage test of the conservator.

2.1.1.12 Certification of all test results.

2.1.2 Core

2.1.2.1 Sample testing of core materials for checking specific loss, bend properties, magnetization characteristics and thickness.

2.1.2.2 Check on the quality of varnish if used on the stampings:
   i) Measurement of thickness and hardness of varnish on stampings.
ii) Solvent resistance test to check that varnish does not react in hot oil.
iii) Check overall quality of varnish by sampling to ensure uniform shining color, no bare spots, no over burnt varnish layer and no bubbles on varnished surface.

2.1.2.3 Check on the amount of burrs.

2.1.2.4 Bow check on stampings.

2.1.2.5 Check for the overlapping of stampings. Corners of the sheet are to be part.

2.1.2.6 Visual and dimensional check during assembly stage.

2.1.2.7 Check for interlaminated insulation between core sectors before and after pressing.

2.1.2.8 Check on completed core for measurement of iron loss and check for any hot spot by exciting the core so as to induce the designed value of flux density in the core.

2.1.2.9 Visual and dimensional checks for straightness and roundness of core, thickness of limbs.

2.1.2.10 High voltage test (2.5kV for one minute) between core and clamps.

2.1.2.11 Certification of all test results.

2.1.3 **Insulation Material**

2.1.3.1 Sample check for physical properties of materials.

2.1.3.2 Check for dielectric strength.

2.1.3.3 Visual and dimensional checks.

2.1.3.4 Check for the reaction of hot oil on insulating materials.

2.1.3.5 Dimension stability test at high temperature for insulating material.

2.1.3.6 Tracking resistance test on insulating material

2.1.3.7 Certification of all test results.

2.1.4 **Winding**

2.1.4.1 Sample check on winding conductor for mechanical properties and electrical conductivity.

2.1.4.2 Visual and dimensional checks on conductor for scratches, dent marks etc.

2.1.4.3 Sample check on insulating paper for pH value, bursting strength and electric strength.

2.1.4.4 Check for the reaction of hot oil on insulating paper.

2.1.4.5 Check for the bonding of the insulating paper with conductor.
2.1.4.6 Check and ensure that physical condition of all materials taken for windings is satisfactory and free of dust.

2.1.4.7 Check for absence of short circuit between parallel strands.

2.1.4.8 Check for brazed joints wherever applicable.

2.1.4.9 Measurement of voltage ratio to be carried out when core/ yoke is completely restacked and all connections are ready.

2.1.4.10 Conductor enamel test for checking of cracks, leakage and pin holes.

2.1.4.11 Conductor flexibility test.

2.1.4.12 Heat shrink test for enameled wire.

2.1.4.13 Certification of all test results.

2.1.5.0 Checks Before Drying Process

2.1.5.1 Check condition of insulation on the conductor and between the windings.

2.1.5.2 Check insulation distance between high voltage connections, cables and earth and other live parts.

2.1.5.3 Check insulating distances between low voltage connections and earth and other parts.

2.1.5.4 Insulation of core shall be tested at 2 kV/ minute between core to bolts and core to clamp plates.

2.1.5.5 Check for proper cleanliness and absence of dust etc.

2.1.5.6 Certification of all test results.

2.1.6.0 Checks During Drying Process

2.1.6.1 Measurement and recording of temperature, vacuum and drying time during vacuum treatment.

2.1.6.2 Check for completeness of drying by periodic monitoring of IR and Tan delta.

2.1.6.3 Certification of all test results.

2.1.7.0 Assembled Transformer

2.1.7.1 Check completed transformer against approved outline drawings, provision for all fittings, finish level etc.

2.1.7.2 Test to check effective shielding of the tank.

2.1.7.3 Jacking test with oil on all the assembled transformers.
2.1.7.4 Dye penetration test shall be carried out after the jacking test.

2.1.8.0 **Bought Out Items**

2.1.8.1 The makes of all major bought out items shall be subject to Purchaser’s approval.

2.1.8.2 The Contractor shall also prepare a comprehensive inspection and testing programme for all bought out/ sub-contracted items and shall submit the same to the Employer for approval. Such programme shall include the following components:

a) Buchholz Relay.
b) Pressure Relief Valve.
c) Axles and wheels.
d) Winding temperature indicators for local and remote mounting.
e) Oil temperature indicators.
f) Bushings.
g) Bushing current transformers.
h) Cooler control cabinet.
i) Cooling equipment.
j) Oil pumps.
k) Fans/ Air Blowers
l) Tap change gear.
m) Terminal connectors.
n) Transformer Oil

The above list is not exhaustive and the Contractor shall also include other bought out items in his programme.

2.2.0 **Factory Tests.**

The manufacturer shall be fully equipped to perform all the required tests as specified. Bidder shall confirm the capabilities of the proposed manufacturing plant in this regard when submitting the bid. Any limitations shall be clearly stated in.

The contractor shall bear all additional costs related to tests which are not possible to carry out at his own works.

The contractor shall carry out type & routine tests as per “Annexure-C & Annexure-D”. All tests shall be done in line with IEC: 60076 and the test procedures as mentioned in “Annexure-C”. Complete test report shall be submitted to purchaser after proper scrutiny and signing on each page by the test engineer of the contractor.

All standard routine tests in accordance with IS: 2026 with dielectric tests corresponding to Method 2 shall be carried out on each transformer. Operation and dielectric testing of OLTC shall also be carried out as per IS: 2026.

2.2.1 In addition to above, the following tests shall be perform on each transformer.

2.2.1.1 **Temp. Rise Test as per IS: 2026 (Part-II).**
Gas chromatographic analysis on oil shall also be conducted before and after this test and the values shall be recorded in the test report. This sampling shall be in accordance with IEC 567. For the evaluation of the gas analysis in temperature rise test the procedure shall be as per IS:9434 (based on IEC:567) and results will be interpreted as per IS:10593 (based on IEC-599).

The temperature rise test shall be conducted at a tap for the worst combination of loading on the three windings of the transformer. The Contractor before carrying out such test shall submit detailed calculation showing alternatives possible, on various taps and for the three types of ratings of the transformer and shall recommend the combination that results in highest temperature rise for the test. The Thermo Vision Scanning and Images shall be taken during Heat Run Test.

2.2.1.2 Measurement of capacitance and Tan Delta of Bushing and Winding. The value of Tan Delta should not exceed 0.5%.

2.2.1.3 **Dynamic Short Circuit Test:-**

Bidder / Manufacturer should have successfully carried out Dynamic Short Circuit Test on similar designed (as per IS 2026 Part (5) clause 4.2, IEC-60076-5 and CEA regulation-2010 with latest amendment) of the same MVA rating of 220kV class transformer within last five years (as on the originally scheduled date of bid opening) and shall enclose the relevant Test Report / Certificate along with bid. If Short Circuit Test has not been carried on transformer of similar design of same MVA rating of 220 kV Voltage class. The same should be carried out by the bidder at his own cost without affecting the delivery period.

2.2.2.0 **Routine tests on bushings**

The following tests shall be conducted on bushings

2.2.2.1 Test for leakage on internal fillings (if applicable).

2.2.2.2 Measurement of creepage distance, dielectric dissipation factor and capacitance.

2.2.2.3 Dry power frequency test on terminal and tapping.

2.2.2.4 Partial discharge test followed by dielectric dissipation factor and capacitance measurement.

2.2.2.5 **Type Tests on fittings:**

All the following fittings shall conform to type tests and the type test reports shall be furnished by the contractor along with the drawings of equipment/ fittings. The list of fittings and the type test requirement is:

1. Bushing (Type Test as per:2099/ IS: 3347IS/ IEC:60137)

2. Buchholz relay (Type Test as per IS:3637 and IP-55 Test on terminal box)

3. OLTC (Temperature Rise of contact, Short circuit current test, Mechanical test and Dielectric Test as per IEC:214 and IP-55 test on driving mechanism box)
4. Cooler control Cabinet (IP-55 test)

5. **Pressure Relief device Test**

   The pressure Relief Device of each size shall be subjected to increase in oil pressure. It shall operate before reaching the test pressure specified in transformer tank pressure test at CI. No. 2.2.6.2 (ii) below. The operating pressure shall be recorded. The device shall seal off after excess pressure has been released.

   The terminal box/ boxes of PRD should conform to degree of protection as per IP-55 of IS: 13947.

6. Magnetic Oil Level gauge & Terminal Box for IP-55 degree of protection.

7. Air Cell (Flexible air separator)- Oil side coating, Air side under Coating, Air side outer coating and coated fabric as per IS:3400/BS:903/ IS:7016.

8. OTI & WTI – Switch setting & operation, Switch differential, Switch rating.

9. Oil pump – Vacuum Test at 250 torr maximum, oil pressure test at 1 kg/cm² for 24 hrs. Temperature rise test by resistance method. IP-55 degree of protection for terminal box.

10. Cooling fan and motor assembly- Free air delivery, Temperature rise, sound level, running at reduced voltage, IP-55 degree of protection for terminal box.

2.3.0 **Pre-Shipment Checks at Manufacturer’s Works**

2.3.1 Check for interchangeability of components of similar transformers for mounting dimensions.

2.3.2 Check for proper packing and preservation of accessories like radiators, busings, dehydrating breather, rollers, buchholz relay, fans, control cubicle, connecting pipes, conservator etc.

2.3.3 Check for proper provision for bracing to arrest the movement of core and winding assembly inside the tank.

2.3.4 Gas tightness test to confirm tightness.

2.3.5 Derivation of leakage rate and ensure the adequate reserve gas capacity.

2.4.0 **Inspection and Testing at Site**

2.4.1 The Contractor shall carry out a detailed inspection and testing programme for field activities covering areas right from the receipt of material stage upto commissioning stage. An indicative programme of inspection as envisaged by the Employer is
given below. However, it is contractor’s responsibility to draw up and carry out such a programme duly approved by the Employer. Testing of oil sample at site shall be carried out for BDV, Moisture content, Tan Delta at 90 deg C, Resistivity at 90 deg C and interfacial tension.

2.5.0 Receipt and Storage Checks

2.5.1 Check and record condition of each package, visible parts of the transformer etc. for any damage.

2.5.2 Check and record the gas pressure in the transformer tank as well as in the gas cylinder.

2.5.3 Visual check for wedging of core and coils before filling up with oil and also check conditions of core and winding in general.

2.5.4 Check and record reading of impact recorder at receipt and verify the allowable limits as per manufacturer’s recommendations.

2.6.0 Installation Checks

Inspection and performance testing of accessories like tap changers, cooling fans, oil pumps etc.

i) Check the direction of rotation of fans and pumps.

ii) Check the bearing lubrication.

iii) Check whole assembly for tightness, general appearance etc.

2.6.1 Oil leakage test

2.6.2 Test on Oil Sample.

2.6.3 Capacitance and tan delta measurement of busing before fixing/ connecting to the winding, contractor shall furnish these values for site reference.

2.6.4 Measure and record the dew point of nitrogen/dry air in the main tank before assembly. Manufacturer shall submit dew point acceptable limits along with temperature correction factor and shall form part of instruction manual. In case dew point values are not within permissible limit suitable drying out process shall be applied for dry out of active part in consultation with the Manufacturer.

The Sequence of operation of tap changers shall be checked. Check should be done for

a) Manual operation
b) Local electrical operation
c) Remote electrical operation
d) Parallel operation

2.6.5 Oil filling.

2.6.6 Oil impregnation or drying under vacuum at site shall be done with the transformer and oil at a temperature not exceeding 70 deg C.

2.6.7 The duration of the vacuum treatment shall be demonstrated as adequate by means of water measurement with a cold trap or other suitable method but shall generally
not be less than 72 hours. The vacuum shall be measured on the top of the transformer tank and should be less than 1 mbar.

2.6.8 Vacuum shall not be broken until the transformer is oil filled up to the Buchholz relay. Whenever the active insulation or any paper insulated HV connections, especially those from the windings to the bushings are exposed, these shall be re-impregnated under vacuum along with the complete transformer. For this purpose the transformer shall first be drained to expose all insulation material.

2.6.9 The minimum safe level of oil filling (if different from the Buchholz level) to which the transformer shall be oil filled under vacuum, shall be indicated in the manual.

2.6.10 Procedures for site drying, oil purification, oil filling etc shall be submitted for approval and complete instructions shall form part of the manual.

2.6.11 The Ultra High Vacuum type oil treatment plant of suitable capacity (preferably 4500 to 6000 litres per hour) suitable for treatment of oil in EHV class transformer shall be used in order to achieve properties of treated oil. The plant shall be capable of treatment of new oil (as per IEC60296 and reconditioning of used oil (as per IEC: 60422 for oil in service) at rated capacity on single pass basis as follows :-

i) Removal of moisture from 100 ppm to 3 ppm (max.).
ii) Removal of dissolved gas content from 10% by Vol. To 0.1% by vol.
iii) Improvement of dielectric strength breaks down voltage from 20 to 70 KV.
iv) Vacuum level of degassing chamber shall be less than 0.15 torr/0.2 mbar at rated flow and at final stage. Machine shall have minimum of two degassing chambers and these should have sufficient surface areas to achieve the final parameters.
v) Filter shall be capable of removing particle size more than 0.5 micron in the filtered oil.
vi) Processing temperature shall be automatically controlled and have a adjustable range from 40\(^0\) C to 80\(^0\) C.

2.7.0 **Commissioning Checks**

2.7.1 Check the colour of silica gel in silica gel breather.

2.7.2 Check the oil level in the breather housing, conservator tanks, cooling system, condenser bushing etc.

2.7.3 Check the bushing for conformity of connection to the lines etc.

2.7.4 Check for correct operation of all protection devices and alarms:
   (i) Buchholz relay.
   (ii) Excessive winding temperature.
   (iii) Excessive oil temperature.
   (iv) Low oil flow.
   (v) Low oil level indication.

2.7.5 Check for the adequate protection on the electric circuit supplying the accessories.
2.7.6 Check resistance of all windings on all steps of the tap changer. Insulation resistance measurement for the following:
   (i) Control Wiring
   (ii) Cooling system motor and control
   (iii) Main windings
   (iv) Tap changer motor and control.
2.7.7 Check for cleanliness of the transformer and the surroundings.
2.7.8 Continuously observe the transformer operation at no load for 24 hours.
2.7.9 Gradually put the transformer on load, check and measure increase in temperature in relation to the load and check the operation with respect to temperature rise and noise level etc.
2.7.10 Phase out and vector group test.
2.7.11 Ratio test on all taps.
2.7.12 Magnetizing current test.
2.7.13 Capacitance and Tan delta measurement of winding and bushing after assembly of transformer. It will provide a base data which would act as guideline for maintenance staff for subsequent condition monitoring of the transformer.
2.7.14 DGA of oil just before commissioning and after 24 hours energisation at site.
2.7.15 **Frequency response analysis (FRA).**
2.7.16 Contractor shall prepare a comprehensive commissioning report including all commissioning test results and forward to Employer for future record.
Section – III: 100MVA 220/33/11 kV Electrical Characteristics and Performance Requirements

3.0 TYPE & RATING

The power transformer shall be of core or shell type construction oil immersed, ONAN/ONAF/OFAF cooled, 3 phase unit suitable for outdoor service as step up/step down transformer. The rating and electrical characteristics shall be as follows:-

SYSTEM PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>220 KV</th>
<th>33 KV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Rated Voltage of Equipment (KV)</td>
<td>245</td>
<td>36</td>
</tr>
<tr>
<td>ii) Rated impulse voltage withstand level (peak) (KV)</td>
<td>1050</td>
<td>170</td>
</tr>
<tr>
<td>iii) Rated one-minute power frequency Withstand voltage (r.m.s.) (KV)</td>
<td>460</td>
<td>70</td>
</tr>
<tr>
<td>iv) Rated short time current rating for 1 sec.(r.m.s.) (KA)</td>
<td>40</td>
<td>31.5</td>
</tr>
</tbody>
</table>

3.1 NORMAL CONTINUOUS RATING IN M.V.A.

a) H.V. Winding summation of (b) and (c), limited to 100MVA
b) L.V. Winding 100 MVA
c) Tertiary Winding 100/3 MVA
d) In case of star/star connected transformer where a specified the stabilizing winding (tertiary winding) shall be capable of carrying continuously the capacitive load to 100% rating of tertiary as specified.

The stabilizing winding shall be designed with particular attention to the suppression of harmonic voltage, especially the third and fifth, so as to eliminate wave-form distortion and possibility of high frequency disturbances, including switching surges, inductive effects or of circulating currents between the neutral points at different transforming stations reaching such a magnitude as to cause interference with communication circuits. The percentage of third and fifth harmonic shall be specified.

The stabilizing winding shall be designed for 170 KV peak B.I.L. Also refer clause 1.10.6.

Windings shall be capable to withstand short circuit currents resulting from different types of system faults that can arise in service associated with relevant system earthing conditions.

3.2 RATED VOLTAGE
a) H.V. Winding  
   220 KV

b) L.V. Winding  
   33 KV

c) Tertiary winding  
   11 KV

### 3.3 CONNECTIONS

a) H.V. Winding  
   Star neutral solidly earthed

b) L.V. Winding  
   Star neutral solidly earthed

c) Tertiary Winding  
   Delta

### 3.4 VECTOR GROUP

YNyn0d11

### 3.5 TYPE OF COOLING AND RATNG

a) ONAN  
   60%

b) ONAF  
   80%

c) OFAF  
   100%

### 3.6 IMPEDEANCE VOLTAGE AT RATED CURRENT FOR THE

**PRINCIPAL TAPPINGS**

a) HV to LV  
   16 % allowable variances as per IS

b) HV to Tertiary  
   24 % allowable variances as per IS

c) LV to Tertiary  
   12 % allowable variances as per IS

The value of impedance on other taps shall be indicated subject to the approval of the Employer at the time of order.

### 3.7 INSULATION LEVEL :

<table>
<thead>
<tr>
<th>Nominal Voltage For equipment KV rms.</th>
<th>Highest system Voltage for equipment KV rms.</th>
<th>Lightening impulse withstand voltage KV peak</th>
<th>Induced over withstands voltage KV rms</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>12</td>
<td>170*</td>
<td>70</td>
</tr>
<tr>
<td>33</td>
<td>36</td>
<td>170</td>
<td>70</td>
</tr>
<tr>
<td>220</td>
<td>245</td>
<td>1050</td>
<td>460</td>
</tr>
</tbody>
</table>

* Also refer clause 1.10.6

The bay width of the 220kV yard is 16.65 metres and as such the bidder may specifically note that the length of the transformer along with the bay width shall not be more than 12.5 Metres. The electrical clearance should be suitable for erecting transformers in two adjacent bays. If adjacent transformers are separated by a distance more than minimum clearance required but less than 35 meters, fire protection wall will be provided between them.
The barrier wall of brick or reinforced cement concrete shall be provided for separation of transformer wherever adequate space is not available. The barrier shall extend at least 300 mm above the transformer bushing and pressure relief vent and length wise 600 mm beyond the transformer including any radiators and tap changer enclosure.

3.8 **Service:**

a) **Rated Frequency** 50 Hz  
b) **Number of phases** 3 (three)

3.9 **On load tap-changer:**

The on load tap-changer shall be in the steps of 1.1/4% on HV winding for HV variation from + 5% to -15% in 16 equal steps. Tap No. 5 shall be the Principal Tap.

3.10 **CLEARANCES:**

The clearances in air between live conductive parts and between live conductive parts to earthed structure shall be as follows:

<table>
<thead>
<tr>
<th>Nominal system</th>
<th>Test Impulse</th>
<th>clearances (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>kV rms</td>
<td>kV peak</td>
<td>Phase to phase</td>
</tr>
<tr>
<td>11</td>
<td>170</td>
<td>280</td>
</tr>
<tr>
<td>33</td>
<td>170</td>
<td>350</td>
</tr>
<tr>
<td>220</td>
<td>1050</td>
<td>2100</td>
</tr>
</tbody>
</table>

3.11 **Temperature Rises:**

With reference to ambient temperatures adopted for purpose of this specification, the temperature rise shall be as under:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Part</th>
<th>External Cooling Winding (Air)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Winding (temp.)</td>
<td>55(^\circ)C when the oil circulation is natural rise by resistance or forced nondirected.</td>
</tr>
<tr>
<td>ii)</td>
<td>Top oil (Temp. rise 50(^\circ)C)</td>
<td>when the transformer is equipped with conservator.</td>
</tr>
</tbody>
</table>

3.12 **PARALLEL OPERATION:**

The power transformers with O.L.T.C. shall be suitable for parallel operation.
3.13 **Bushing**

Each bushing shall be capable to carry at least 200% current at C.M.R. and to withstand short circuit current of not less then ten times of the nominal current of three seconds.

**220 kV terminals:** 245 kV RIP bushings complete with terminal connectors suitable for double ACSR Zebra conductor.

**33 kV terminals:** Oil communicating type/ solid porcelain bushing complete with terminal connectors suitable for quad ACSR Zebra conductor.

**11KV Terminals:** Oil communicating type/ solid porcelain bushing on top of transformer tank. Arrangement of connecting Single ACSR conductor/ bus bar to Aux. LT Transformer through Isolator, C.T., P.T and Circuit breaker, shall be provided.

3.14 **FLUX DENSITY**

i) The maximum designed continuous flux density in any part of the cored and yoke at normal voltage and frequency shall not exceed 1.6 TESLA.

ii) The maximum flux density in any part of the cores and yoke at normal voltage and frequency shall be such that the flux density on any tap position with plus 10% voltage variation from voltage corresponding to the tap shall not exceed 1.9 TESLA

i) Transformers shall withstand, without injurious heating, combined voltage and frequency fluctuations which produce the following over fluxing conditions:

- 110 % for continuous
- 125% for 1 – minute
- 140% for 5 – seconds

3.15 **RADIO INFLUENCE AND NOISE LEVEL:**

i) The transformer shall be designed with particular attention to the suppression of maximum harmonic voltage, especially the third and fifth, so as to minimize interference with communication circuit.

ii) The noise-level when energized at normal voltage and frequency with fans and pumps running shall not be more than 0.5 db above the NEMA Standard Publication TR-1.

3.16 **CONTINUOUS MAXIMUM RATING & OVERLOAD**

a) Transformer specified for mixed cooling shall be capable of operating under the natural cooled condition upto the specified load. The forced cooling equipment
shall come into operation by contacts of winding temperature indicator and the transformer shall operate as a forced cooled unit.

b) Transformers shall be capable of operating under natural cooled condition up to the specified load. The forced cooling equipment shall come into operation by pre-set contacts of winding temperature indicator and the transformer shall operate as a forced cooling unit initially as ONAF up to specified load and then as OFAF. Cooling shall be so designed that during total failure of power supply to cooling fans and oil pumps, the transformer shall be able to operate at full load for at least ten (10) minutes without the calculated winding hot spot temperature exceeding 140degC. Transformers fitted with two coolers, each capable of dissipating 50 per cent of the loss at continuous maximum rating, shall be capable of operating for 20 minutes in the event of failure of the oil circulating pump or blowers associated with one cooler without the calculated winding hot spot temperature exceeding 140degC at continuous max rating. The contractor shall submit supporting calculations for the above for Purchaser’s approval.

c) The transformers shall be capable of being loaded in accordance with IS: 6600. There shall be no limitations imposed by bushings, tap changer etc. Please refer clause 3.13.

d) The transformer shall be capable of being operated without danger on any tapping at the rated KVA, with voltage variation of +10% corresponding to the voltage of the tapping.

e) The transformers and all its accessories shall be designed to withstand without injury, the thermal and mechanical effects of any external short circuit to earth and of short circuits at the terminals of any winding for a period of 3 secs. The short circuit level of the HV & IV system to which the subject transformers will be connected is 40kA for 220KV system and 31.5kA for 33KV system.

3.17 FITTINGS AND ACCESSORIES

The fittings and accessories as per annexure ‘A’ shall be provided with each transformer covered in this specification.

3.18 GUARANTEE, EVALUATION OF LOSSES & PENALTIES:

The no-load losses, load-losses shall be stated in the offer:

3.18.1 The Indian Standards specification IS:2026 allow certain tolerances for acceptance of the transformer no load and load losses. The bidders are to indicate whether the figures given for guaranteed losses in schedule of guaranteed technical particulars are with or without such tolerances. If tolerances are applicable, the limits for the same should be indicated. In the absence of any information to this effect, the figures for no load and load losses (including auxiliary losses) will be increased by 10% as provided in IEC-60076 & IS:2026). Any changes in the figures assigned for transformer loses will not be permitted after opening of the bids and bid evaluation will be carried out on the basis of information made available at the time of bid opening.

3.18.2 The no load loss in kilo-watts at rated voltage and rated frequency and the total losses in kilo-watts at rated output, rated voltage and rated frequency shall be
guaranteed under penalty, For the purpose of penalty computations, the test figures of these losses shall be compared with the corresponding guaranteed figures.

3.18.3 The penalties shall be separately evaluated from the excess of the test figures of the no-load loss in kilo-watts, over the corresponding guaranteed value and the excess of the difference between the test values of the total losses and the no-load loss in kilowatts, over the difference of the corresponding guaranteed values. No tolerance shall be permitted over the test figures of the losses.

3.18.4 The penalties shall be calculated at the rate of Rs.171300/-per kilo-watt for the excess of no-load loss, the rate of Rs.69900/-per kilo watt for the excess of difference in the total and the no-load losses and the rate of Rs.68500/- per KW for cooler Loss. For fraction of kilo-watt, the penalties shall be applied pro-rata.

3.18.5 For the purpose of comparison of tenders, the quoted prices shall be equalized for the transformer losses at the following rates:

i) No load losses: @ Rs.171300/- per KW

ii) Load losses : @ Rs.69900/- per KW

iii) Cooler Loss (KW): @ Rs.68500/- per KW

3.18.6 The bidder should note that values assigned for the capitalization of losses are based on the present worth and therefore capitalization of investment will not be made separately.

3.19 GUARANTEE, EVALUATION OF AUXILIARY POWER CONSUMPTION AND PENALTIES:

3.19.1 The power consumed at full load by the fans, oil pumps and any other auxiliary apparatus shall be stated in the offer which shall be guaranteed. Tolerance, if any on this figure shall also be indicated failing which a tolerance of 10% shall be assumed. For the purpose of evaluation of tenders and imposition of penalty the guaranteed figure after taking in account the maximum tolerance if any, shall be assumed.

3.19.2 For the purpose of evaluation of tenders, the power consumption (i.e. installed capacity) of the auxiliaries shall be considered for 20% of the capacity and shall be capitalized to arrive at the final evaluated price for comparison. For the purpose of evaluation, the rates as given in para 3.18.4 above shall be taken.

3.20 REJECTION

The Employer may reject any transformer if during tests or service any of the following conditions arise:

a) No load loss exceeds the guaranteed value by 15% or more.
b) Load loss exceeds the guaranteed value by 15% or more.
c) Total losses exceed the guaranteed value by 10% or more.
d) Impedance value exceeds the guaranteed value by $\pm 10\%$ or more.

e) Transformer fails on impulse test.

f) Transformer fails on power frequency voltage withstand test.

g) Transformer is proved to have been manufactured not in accordance with the specification.

3.21 **SPARE PARTS & MAINTENANCE EQUIPMENT:**

In making a bid for the equipment, the Bidder may offer recommended spare parts and a list of optional accessories, the rates of which will be valid for two years from the date of successful commissioning of transformer.

3.22 **STANDARD**

The transformer shall generally conform to the IEC/IS specification and CBIP recommendations except for certain technical variations as per specification.

3.23 Transformer shall be provided with gas collecting device.
4.1 NCT for 220 KV side Neutral for 220/33/11kV Transformers

a) C.T. Ratio: 400/1 A  
b) Highest voltage for equipment: 17.5 KV  
c) Rated short duration power frequency withstand voltage: 38 KV (r.m.s)  
d) Secondary current: 1 Amp.  
e) Rated impulse withstand voltage: 95 KV (P)  
f) Purpose: Relaying (restricted earth fault protection)  
g) Class of accuracy: PS  
h) Min. Knee point voltage $V_k$ : $V_k > K.I_s (R_{ct} + R_b) V$  
   (Rct.-Resistance of secondary winding)  
i) Max. exciting current at $V_k/2$: 30 mA

4.2 NCT for 33 KV side Neutral of 220/33/11 KV Transformers

a) C.T. Ratio: 2000/1 A  
b) Highest voltage for equipment: 17.5 KV  
c) Rated short duration power frequency withstand voltage: 38 KV  
d) Rated impulse withstand voltage: 95 KV (P)  
e) Purpose: Relaying (restricted earth fault protection)  
f) Secondary current: 1 Amp.  
g) Class of accuracy: PS  
h) Min. Knee point voltage $V_K$: $V_K > K.I_s (R_{ct} + R_b) V$  
   (Rct.-Resistance of secondary winding)  
i) Max. exciting current at $V_K/2$: 30 mA

4.3 CONSTRUCTION DETAILS:

4.3.1 The current transformers shall be oil immersed and self cooled outdoor type suitable for the specified services indicated, completed in all respects and in accordance with best engineering practice design and workmanship.

4.3.2 The core shall be of high grade non ageing, electrical silicon laminated steel of low hysteresis loss high permeability to ensure high accuracy at both normal and over current, extended current conditions and shall produce undistorted secondary current under transient conditions at all ratios.

4.3.3 The oil immersed CT shall be hermetically sealed to eliminate breathing and to prevent air and moisture and shall be provided with a pressure relieving device capable to releasing abnormal internal pressure. C.T. shall be provided with oil level gauge, and necessary arrangement for replacing the oil shall be provided.
4.3.4 The current transformers shall be suitable for simultaneous 100% full load continuous rating of the winding.

4.3.5 The ratio changing taps if any, shall be provided only on the secondary winding of the C.T.

4.3.6 Current transformers cores to be used for protective relaying purposes shall be of accuracy class specified, suitable for restricted earth fault protection.

4.3.7 The secondary terminals shall be brought out in a weather proof terminal box (with degree of protection IP55) on the side of the current transformer and shall be accessible through a removable cover. The secondary tap shall be adequately reinforced to withstand normal handling without damage. Suitable cable glands shall be provided to accommodate purchaser’s control cables.

4.3.8 The maximum permissible temperature rise of the windings over the ambient shall not exceed 40°C.

4.3.9 The magnetising curve for each core shall be furnished with the tender.

4.3.10 The secondary terminals shall be provided with short circuiting and earthing arrangements at the terminal block.

4.3.12 The C.T.s shall be suitable for horizontal as well as vertical transportation.

4.4 **INSULATING OIL**

The quality of insulating oil in each transformer shall be best available and the complete specification of the oil shall be furnished in the tender. The current transformers offered shall be hermetically sealed completely filled with insulating oil. The insulating oil shall conform to the latest Indian Standard specification No. 335.

4.5. **BUSHINGS / INSULATORS**

i) a) Porcelain used in bushing / Insulator manufacture shall be homogeneous, free from laminations, cavities and other flaws or imperfections that might effect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture.

b) Glazing of the porcelain shall be of uniform brown colour free from blisters, burrs and similar other defects. Bushings shall be designed to have ample insulation, mechanical strength and rigidity for the conditions, under which they will be used.

ii) When operating at normal rated voltage there will be no electric discharge between the conductors and bushing which would cause corrosion or injury to conductors, insulators or supports by the formation of substances produced by chemical action. No radio interference shall be caused by the bushings/ Insulator when operating at the normal rated voltage.

iii) All iron parts shall be hot dip galvanized and all joints shall air tight. Surfaces of the joints shall be trued up, porcelain parts by grinding and metal parts by
machining. Bushing/ Insulator design shall be such as to ensure a uniform compressive pressure on the joints.

iv) The creepage distance of the bushing /Insulator shall in no case be less than 31mm/KV, suitable for heavily polluted atmosphere.

v) Bushing/ Insulator shall be tested for type tests and routine tests in accordance with stipulation of IS-2099/ IS-5621 Routine as well as type tests reports in conformity with IS-2099/ IS-5621 shall be furnished to the purchaser.

Further type test for **thermal stability test as per IEC 60137 or ant latest amendment.**

4.6 TERMINAL CONNECTORS:

4.6.1 The current transformer offered shall be supplied with indigenous rigid type, Die casted, bimetallic (wherever applicable) terminal connectors suitable for single/double ACSR Zebra conductor or 3” / 4”IPS Aluminium tube as per requirement conforming to IS-5561.
SECTION – V: 160MVA 220/66/11 kV Electrical Characteristics and Performance Requirements

5.0 TYPE & RATING

The power transformer shall be of core or shell type construction oil immersed, ONAN/ONAF/OFAF cooled, 3 phase unit suitable for outdoor service as step up/step down transformer. The rating and electrical characteristics shall be as follows:-

SYSTEM PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>220 KV</th>
<th>66KV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage</td>
<td>220</td>
<td>66</td>
</tr>
<tr>
<td>i) Rated Voltage of Equipment (KV)</td>
<td>245</td>
<td>72.5</td>
</tr>
<tr>
<td>ii) Rated impulse voltage withstand level (peak) (KV)</td>
<td>1050</td>
<td>325</td>
</tr>
<tr>
<td>iii) Rated one-minute power frequency Withstand voltage (r.m.s.) (KV)</td>
<td>460</td>
<td>140</td>
</tr>
<tr>
<td>iv) Rated short time current rating for 1 sec. (r.m.s.) (KA)</td>
<td>40</td>
<td>31.5</td>
</tr>
</tbody>
</table>

5.1 NORMAL CONTINUOUS RATING IN M.V.A.

a) H.V. Winding summation of (b) and (c), limited to 160MVA

b) L.V. Winding 160

c) Tertiary Winding $\frac{160}{3}$

In case of star/star connected transformer where a specified the stabilizing winding (tertiary winding) shall be capable of carrying continuously the capacitive load to 100% rating of tertiary as specified.

The stabilizing winding shall be designed with particular attention to the suppression of harmonic voltage, especially the third and fifth, so as to eliminate wave-form distortion and possibility of high frequency disturbances, including switching surges, inductive effects or of circulating currents between the neutral points at different transforming stations reaching such a magnitude as to cause interference with communication circuits. The percentage of third and fifth harmonic shall be specified.

The stabilizing winding shall be designed for 170 KV peak B.I.L. Also refer clause 1.10.6.

Windings shall be capable to withstand short circuit currents resulting from different types of system faults that can arise in service associated with relevant system earthing conditions.

5.2 RATED VOLTAGE

a) H.V. Winding 220 KV

b) L.V. Winding 66 KV

c) Tertiary winding 11 KV

5.3 CONNECTIONS
a) H.V. Winding            Star neutral solidly earthed  
b) L.V. Winding            Star neutral solidly earthed  
c) Tertiary Winding        Delta  

5.4 VECTOR GROUP  YNyn0d11  

5.5 TYPE OF COOLING AND RATNG  

a) ONAN  60%  
b) ONAF  80%  
c) OFAF  100%  

5.6 IMPEDENCE VOLTAGE AT RATED CURRENT FOR THE  

PRINCIPAL TAPPINGS ON 160MVA BASE  

a) HV to MV     16% allowable variances as per IS  
b) HV to Tertiary  24% allowable variances as per IS  
c) MV to Tertiary  12% allowable variances as per IS  

The value of impedance on other taps shall be indicated subject to the approval of the Employer at the time of order.  

5.7 INSULATION LEVEL :  

<table>
<thead>
<tr>
<th>Nominal Voltage For equipment KV rms.</th>
<th>Highest Lightening impulse withstand voltage KV peak</th>
<th>Induced over Voltage withstand voltage KV rms</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>12</td>
<td>170*</td>
<td>70</td>
</tr>
<tr>
<td>66</td>
<td>72.5</td>
<td>325</td>
<td>140</td>
</tr>
<tr>
<td>220</td>
<td>245</td>
<td>1050</td>
<td>460</td>
</tr>
</tbody>
</table>

* Also refer clause 1.10.6  

The bay width of the 220kV yard is 16.65 metres and as such the bidder may specifically note that the length of the transformer along with the bay width shall not be more than 12.5 Metres. The electrical clearance should be suitable for erecting transformers in two adjacent bays. If adjacent transformers are separated by a distance more than minimum clearance required but less than 35 meters, fire protection wall will be provided between them.  

The barrier wall of brick or reinforced cement concrete shall be provided for separation of transformer wherever adequate space is not available. The barrier shall extend at least 300 mm above the transformer bushing and pressure relief vent and length wise 600 mm beyond the transformer including any radiators and tap changer enclosure.  

5.8 Service:  

a) Rated Frequency  50 Hz  
b) Number of phases  3 (three)
5.9 **On load tap-changer:**

The on load tap-changer shall be in the steps of 1.1/4% on HV winding for HV variation from + 5% to -15% in 16 equal steps. Tap No. 5 shall be the Principal Tap.

5.10 **CLEARANCES:**

The clearances in air between live conductive parts and between live conductive parts to earthed structure shall be as follows:

<table>
<thead>
<tr>
<th>Nominal system</th>
<th>Test Impulse</th>
<th>clearances (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Voltage</td>
<td>Phase to phase</td>
<td>Phase to earth</td>
</tr>
<tr>
<td>kV rms kV peak</td>
<td>70</td>
<td>280</td>
</tr>
<tr>
<td>66</td>
<td>325</td>
<td>630</td>
</tr>
<tr>
<td>220</td>
<td>1050</td>
<td>2100</td>
</tr>
</tbody>
</table>

5.11 **Temperature Rises:**

With reference to ambient temperatures adopted for purpose of this specification, the temperature rise shall be as under:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Part</th>
<th>External Cooling Winding (Air)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Winding (temp.)</td>
<td>55°C when the oil circulation is natural rise by resistance or forced non-directed.</td>
</tr>
<tr>
<td>ii)</td>
<td>Top oil (Temp. rise with conservator)</td>
<td>50°C (when the transformer is equipped)</td>
</tr>
</tbody>
</table>

5.12 **PARALLEL OPERATION:**

The power transformers with O.L.T.C. shall be suitable for parallel operation.

5.13 **Bushing**

Each bushing shall be capable to carry at least 200% current at C.M.R. and to withstand short circuit current of not less than ten times of the nominal current of three seconds.

11 KV Terminals: Oil communicating type/ solid porcelain bushing on top of transformer tank. Arrangement of connecting Single ACSR conductor/ bus bar to Aux. LT Transformer through Isolator, C.T., P.T and Circuit breaker, shall be provided.

66 kV terminals: 72.5 kV RIP bushings complete with terminal connectors suitable for quad ACSR Zebra conductor.
220 kV terminals: 245 kV RIP bushings complete with terminal connectors suitable for double ACSR Zebra conductor.

5.14 FLUX DENSITY

i) The maximum designed continuous flux density in any part of the core and yoke at normal voltage and frequency shall not exceed 1.6 TESLA.

ii) The maximum flux density in any part of the core and yoke at normal voltage and frequency shall be such that the flux density on any tap position with plus 10% voltage variation from voltage corresponding to the tap shall not exceed 1.9 TESLA

ii) Transformers shall withstand, without injurious heating, combined voltage and frequency fluctuations which produce the following over fluxing conditions:
   - 110% Continuous
   - 125% for 1 – minute
   - 140% for 5 – seconds

5.15 RADIO INFLUENCE AND NOISE LEVEL:

i) The transformer shall be designed with particular attention to the suppression of maximum harmonic voltage, especially the third and fifth, so as to minimize interference with communication circuit.

ii) The noise-level when energized at normal voltage and frequency with fans and pumps running shall not be more than 0.5 db above the NEMA Standard Publication TR-1.

5.16 CONTINUOUS MAXIMUM RATING & OVERLOAD

a) Transformer specified for mixed cooling shall be capable of operating under the natural cooled condition up to the specified load. The forced cooling equipment shall come into operation by contacts of winding temperature indicator and the transformer shall operate as a forced cooled unit.

b) Transformers shall be capable of operating under natural cooled condition up to the specified load. The forced cooling equipment shall come into operation by pre-set contacts of winding temperature indicator and the transformer shall operate as a forced cooling unit initially as ONAF up to specified load and then as OFAF. Cooling shall be so designed that during total failure of power supply to cooling fans and oil pumps, the transformer shall be able to operate at full load for at least ten (10) minutes without the calculated winding hot spot temperature exceeding 140degC. **Transformers** fitted with two coolers, each capable of dissipating 50 per cent of the loss at continuous maximum rating, shall be capable of operating for 20 minutes in the event of failure of the oil circulating pump or blowers associated with one cooler without the calculated winding hot spot temperature exceeding 140degC at **continuous** max rating. The contractor shall submit supporting calculations for the above for Purchaser’s approval.
c) The transformers shall be capable of being loaded in accordance with IS:6600. There shall be no limitations imposed by bushings, tap changer etc. Please refer clause 5.13.

d) The transformer shall be capable of being operated without danger on any tapping at the rated KVA, with voltage variation of \( \pm 10\% \) corresponding to the voltage of the tapping.

e) The transformers and all its accessories shall be designed to withstand without injury, the thermal and mechanical effects of any external short circuit to earth and of short circuits at the terminals of any winding for a period of 3 secs. The short circuit level of the HV & IV system to which the subject transformers will be connected is 40KA for 220KV system and 31.5KA for 66KV system.

5.17 FITTINGS AND ACCESSORIES

The fittings and accessories as per annexure ‘A’ shall be provided with each transformer covered in this specification.

5.18 GUARANTEE, EVALUATION OF LOSSES & PENALTIES:

The no-load losses, load-losses shall be stated in the offer:

5.18.1 The Indian Standards specification IS:2026 allow certain tolerances for acceptance of the transformer no load and load losses. The bidders are to indicate whether the figures given for guaranteed losses in schedule of guaranteed technical particulars are with or without such tolerances. If tolerances are applicable, the limits for the same should be indicated. In the absence of any information to this effect, the figures for no load and load losses (including auxiliary losses) will be increased by 10% as provided in IEC-60076 & IS:2026). Any changes in the figures assigned for transformer loses will not be permitted after opening of the bids and bid evaluation will be carried out on the basis of information made available at the time of bid opening.

5.18.2 The no load loss in kilo-watts at rated voltage and rated frequency and the total losses in kilo-watts at rated output, rated voltage and rated frequency shall be guaranteed under penalty. For the purpose of penalty computations, the test figures of these losses shall be compared with the corresponding guaranteed figures.

5.18.3 The penalties shall be separately evaluated from the excess of the test figures of the no-load loss in kilo-watts, over the corresponding guaranteed value and the excess of the difference between the test values of the total losses and the no-load loss in kilowatts, over the difference of the corresponding guaranteed values. No tolerance shall be permitted over the test figures of the losses.

5.18.4 The penalties shall be calculated at the rate of Rs.171300/-per kilo-watt for the excess of no-load loss, the rate of Rs.69900/-per kilo watt for the excess of difference in the total and the no-load losses and the rate of Rs.68500/- per KW for cooler Loss. For fraction of kilo-watt, the penalties shall be applied pro-rata.

5.18.5 For the purpose of comparison of tenders, the quoted prices shall be equalized for the transformer losses at the following rates:

i) **No load losses : @ Rs.171300/-per KW**
ii) Load losses : @ Rs.69900/- per KW
iii) Cooler Loss (KW):@ Rs.68500/- per KW

5.18.6 The bidder should note that values assigned for the capitalization of losses are based on the present worth and therefore capitalization of investment will not be made separately.

5.19 GUARANTEE, EVALUATION OF AUXILIARY POWER CONSUMPTION AND PENALTIES:

5.19.1 The power consumed at full load by the fans, oil pumps and any other auxiliary apparatus shall be stated in the offer which shall be guaranteed. Tolerance, if any on this figure shall also be indicated failing which a tolerance of 10% shall be assumed. For the purpose of evaluation of tenders and imposition of penalty the guaranteed figure after taking in account the maximum tolerance if any, shall be assumed.

5.19.2 For the purpose of evaluation of tenders, the power consumption of the auxiliaries shall be considered for 20% of the capacity and shall be capitalized to arrive at the final evaluated price for comparison. For the purpose of evaluation, the rates as given in para 3.18.4 above shall be taken.

5.20 REJECTION

The Employer may reject any transformer if during tests or service any of the following conditions arise:-

a) No load loss exceeds the guaranteed value by 15% or more.
b) Load loss exceeds the guaranteed value by 15% or more.
c) Total losses exceed the guaranteed value by 10% or more.
d) Impedance value exceeds the guaranteed value by ± 10% or more.
e) Transformer fails on impulse test.
f) Transformer fails on power frequency voltage withstand test.
g) Transformer is proved to have been manufactured not in accordance with the specification.

5.21 SPARE PARTS & MAINTENANCE EQUIPMENT:

In making a bid for the equipment, the Bidder may offer recommended spare parts and a list of optional accessories, the rates of which will be valid for two years from the date of successful commissioning of transformer.

5.22 STANDARD

The transformer shall generally conform to the IEC/IS specification and CBIP recommendations except for certain technical variations as per specification.

5.23 Transformer shall be provided with gas collecting device.
SECTION -VI: 160 MVA 220/66/11 kV Neutral Current Transformer

6.1 NCT for 220 KV side Neutral for 220/66/11kV Transformers

a) C.T. Ratio 800/1 A
b) Highest voltage for equipment 17.5 KV
c) Rated short duration power frequency withstand voltage 38 KV(r.m.s)
d) Secondary current 1 Amp.
e) Rated impulse withstand voltage 95 KV (P)
f) Purpose Relaying (Restricted Earth fault protection)
g) Class of accuracy PS
h) Min. Knee point voltage V_k \geq K.I_k(R_{ct} + R_b) V
   (Rct.-Resistance of secondary winding)
i) Max. exciting current at V_k/2 30 mA

6.2 NCT for 66 KV side Neutral of 220/66/11 KV Transformers (160MVA)

a) C.T. Ratio 2000/1 A
b) Highest voltage for equipment 17.5 KV
c) Rated short duration power frequency withstand voltage 38 KV
d) Rated impulse withstand voltage 95 KV (P)
e) Purpose Relaying (Restricted Earth fault protection)
f) Secondary current 1 Amp.
g) Class of accuracy PS
h) Min. Knee point voltage V_k \geq K.I_k(R_{ct} + R_b) V
   (Rct.-Resistance of secondary winding)
i) Max. exciting current at V_k/2 less than or equal to 30 mA

6.3 CONSTRUCTION DETAILS:

6.3.1 The current transformers shall be oil immersed and self cooled outdoor type suitable
for the specified services indicated, completed in all respects and in accordance
with best engineering practice design and workmanship.

6.3.2 The core shall be of high grade non ageing, electrical silicon laminated steel of low
hysteresis loss high permeability to ensure high accuracy at both normal and over
current, extended current conditions and shall produce undistorted secondary current
under transient conditions at all ratios.

6.3.3 The oil immersed CT shall be hermetically sealed to eliminate breathing and to
prevent air and moisture and shall be provided with a pressure relieving device
capable to releasing abnormal internal pressure. C.T. shall be provided with oil level
gauge, and necessary arrangement for replacing the oil shall be provided.

6.3.4 The current transformers shall be suitable for simultaneous 100% full load continuous
rating of the winding.
6.3.5 The ratio changing taps if any, shall be provided only on the secondary winding of the C.T.

6.3.6 Current transformers cores to be used for protective relaying purposes shall be of accuracy class specified, suitable for restricted earth fault protection.

6.3.7 The secondary terminals shall be brought out in a weather proof terminal box (with degree of protection IP55) on the side of the current transformer and shall be accessible through a removable cover. The secondary tap shall be adequately reinforced to withstand normal handling without damage. Suitable cable glands shall be provided to accommodate purchaser’s control cables.

6.3.8 The maximum permissible temperature rise of the windings over the ambient shall not exceed 40°C.

6.3.9 The magnetizing curve for each core shall be furnished with the tender.

6.3.10 The secondary terminals shall be provided with short circuiting and earthing arrangements at the terminal block.

6.3.11 The C.T.s shall be suitable for horizontal as well as vertical transportation.

6.4 **INSULATING OIL:**

The quality of insulating oil in each transformer shall be best available and the complete specification of the oil shall be furnished in the tender. The current transformers offered shall be hermetically sealed completely filled with insulating oil. The insulating oil shall conform to the latest Indian Standard specification No. 335.

6.5. **BUSHINGS / INSULATORS**

i) a) Porcelain used in bushing / Insulator manufacture shall be homogeneous, free from laminations, cavities and other flaws or imperfections that might effect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture.

b) Glazing of the porcelain shall be of uniform brown colour free from blisters, burrs and similar other defects. Bushings shall be designed to have ample insulation, mechanical strength and rigidity for the conditions, under which they will be used.

ii) When operating at normal rated voltage there will be no electric discharge between the conductors and bushing which would cause corrosion or injury to conductors, insulators or supports by the formation of substances produced by chemical action. No radio interference shall be caused by the bushings/ Insulator when operating at the normal rated voltage.

iii) All iron parts shall be hot dip galvanized and all joints shall air tight. Surfaces of the joints shall be trued up, porcelain parts by grinding and metal parts by machining. Bushing/ Insulator design shall be such as to ensure a uniform compressive pressure on the joints.
iv) The creepage distance of the bushing /Insulator shall in no case be less than 31 mm/KV, suitable for heavily polluted atmosphere.

i) Bushing/ Insulator shall be tested for type tests and routine tests in accordance with stipulation of IS-2099/ IS-5621 Routine as well as type tests reports in conformity with IS-2099/ IS-5621 shall be furnished to the purchaser.

6.6 TERMINAL CONNECTORS:

6.6.1 The current transformer offered shall be supplied with indigenous rigid type, Die casted, bimetallic (wherever applicable) terminal connectors suitable for single/double ACSR Zebra conductor or 3” / 4”IPS Aluminium tube as per requirement conforming to IS-5561.
Annexure-A

FITTINGS AND ACCESSORIES

The transformer shall be complete with following fittings and accessories:-

i) Set of bushing and terminal connectors for primary winding.

ii) Set of bushing and terminal connectors for secondary winding.

iii) Set of bushings and terminal connectors for tertiary winding.

iv) Neutral bushings with connectors and earth bars.

v) Conservator with oil filling hole, cap and drain valve.

vi) Magnetic type oil gauge with low oil level alarm.

vii) Prismatic oil level gauge.

viii) Oil preservation equipment with necessary arrangements to connect preservation equipment.

   a) Buchholz relay with testing and sampling cocks, alarm and trip contacts and one isolating valve on conservator side – size 80 mm.

   b) Oil surge relay for OLTC conservator tanks with isolating valve and trip contacts.

   c) Sudden pressure relay.

ix) Pressure relief device.

x) Pocket on tank cover for thermometer

xi) Oil temperature indicator with maximum pointer and two sets of contacts.

xii) Winding temperature indicators with maximum pointer with 4 sets of contacts (for ONAN/ONAF/ OFAF)

xiii) Repeater dials of winding temperature, oil temperature for remote indication.

xiv) VALVES

   a) Oil shut off valves between cooler and main tank as specified.

   b) Drain valve – size 100 mm.

   c) 2 Nos. filter valves on diagonally opposite corners – size 50 mm

   d) 2 Nos. sampling valves at top and bottom of main tank.

xv) Earthing terminals (2 Nos.)

xvi) Rating and diagram plates

xvii) Valve Schedule Plate
xviii) Jacking pads

xix) Lifting bollards

xx) Haulage lugs

xxi) Cover Lifting lugs

xxii) Bi-directional flanged rollers with locking and bolting device arranged for rail gauge as specified.

xxiii) Marshalling box (Weather proof) for housing control equipment and terminal connections.

xxiv) Air release devices

xxv) Wiring upto Marshalling Box with PVC Copper cables, 1100 Volts grade.

xxvi) On-load tap changing gear with remote control panel as specified (with AVR Relay)

xxvii) Ladder with safety flap.

xxviii) Cooling Accessories

(a) ONAN/OFAF

1. Oil Pumps
2. Oil flow indicator with alarm contacts.
3. Drain valve and sampling device
4. Air release devices
5. Filter valves.
6. Coolers/Radiators with integral fans and shut off valves.

Brass encased thermometers – Two Nos. of metal encased thermometers for fixing on incoming and outgoing headers on coolers.

xxix) Insulating oil with 10% extra oil (In non returnable M.S. drum)

The fittings and accessories listed above are only indicative and any other fittings and accessories which generally are required for satisfactory operation of the transformer are deemed to be included, unless specifically excluded.

xxx) Oil Storage Tank and Oil Sampling Bottle

Specification of above is attached in Annexure-B

xxxii) Ladder to climb up to the transformer tank cover with suitable locking arrangement to prevent climbing during charged condition.

xxxii) Suitable galvanized iron or stainless steel tray for cabling on main tank for better aesthetics.
xxxiii) One set of hand tools of reputed make packed in a carry bag/box broadly comprising of double ended spanners (open jaws, cranked ring, tubular with Tommy bar each of sizes 9mm to 24mm, one set each), adjustable wrenches (8 & 12 inch one set), pliers (flat nose, round nose & side cutting one of each type), hammer with handle (one), files with handle (two), knife with handle (one), adjustable hacksaw (one), and cold chisel (one) shall be supplied.
Annexure-B

1.0 OIL STORAGE TANK (applicable as per BPS)

1.1 General

This specification covers supply of oil storage tank of 15 cubic meter capacity along with complete accessories.

1.2 Standard: The oil storage tank shall be designed and fabricated as per relevant Indian Standards e.g. IS:803 or other internationally acceptable standards.

1.3 Specifications

Transformer oil storage tanks shall be towable & rested on pneumatic tyres of adequate quantity & size. The tank shall be to cylindrical shape & mounted horizontally and made of mild steel plate of adequate thickness. Size of the storage tank shall be as follows:

Diameter : 2.5 meter and Capacity : 15 cubic metre

The tank shall be designed for storage of oil at a temperature of 100ºC.

1.4 The Bidder may further note that maximum height of any part of the complete assembly of the storage tank shall not exceed 4.0 metres above road top.

1.5 The tank shall have adequate number of jacking pad so that it can be kept on jack while completely filled with oil. The tank shall be provided with suitable saddles so that tank can be rested on ground after removing the pneumatic tyres.

1.6 The tank shall also fitted with manhole, outside & inside access ladder, silicagel breather assembly, inlet & outlet valve, oil sampling valve with suitable adopter, oil drainage valve, air vent etc. Pulling hook on both ends of the tank shall be provided so that the tank can be pulled from either end while completely filled with oil. Bidder shall indicate the engine capacity in horse-power to pull one tank completely fitted with oil. Oil level indicator shall be provided with calibration in terms of litre so that at any time operator can have an idea of oil in the tank. Suitable arrangement shall also be provided to prevent overflow in the tank. The following accessories shall also form part of supply along with each Oil storage tank.

(i) Four numbers of suitable nominal bore rubber hoses for transformer oil application up to temperature of 100º C, full vacuum and pressure up to 2.5 Kg/ cm² with couplers and unions each not less than 10 metre long shall be provided.

(ii) Two numbers of suitable nominal bore vacuum hoses, suitable for full vacuum without collapsing and kinking, with couplers and unions each not less than 10 metre long shall also be provided.

(iii) One number of digital vacuum gauge with sensor capable of reading up to 0.001 torr, operating on 240V 50Hz AC supply shall be supplied. Couplers and unions for sensor should block oil flow in the sensor. Sensor shall be provided.
with atleast 8 meter cable so as to suitably place the Vacuum gauge at ground level.

1.7 The internal & external surfaces to be painted shall be shot or sand blasted to remove all rust and scale of foreign adhering matter or grease. All steel surfaces in contact with insulating oil shall have painted with two coats of heat & oil resistant anti-corrosive paint.

All steel surfaces exposed to weather shall be given a primary coat of zinc chromate, second coat of oil & weather resistant paint of a colour distinct from primary and final two coats of glossy oil & weather resistant light grey paint in accordance with shade no. 631 of IS:5. All paints shall be carefully selected to withstand heat & extremes of weather. The paint shall not scale off or crinkle or be removed by abrasion due to normal handling. The minimum thickness of outside painting of tank shall be 20 microns per coat the total thickness shall be within 70 to 100 microns.

1.8 The tank shall contain a self mounted centrifugal oil pump with inlet and outlet valves, with couplers -suitable for flexible rubber hoses and necessary switchgear for its control. There shall be no rigid connection to the pump. The pump shall be electric motor driven, and shall have a discharge of not less than 6.0 kl/hr. with a discharge head of 8.0m. The pump motor and the control cabinet shall be enclosed in a cubical with IP-55 enclosure.

2.0 OIL SAMPLING BOTTLE

2.1 Oil sampling bottles shall be suitable for collecting oil samples from transformers and shunt reactors, for Dissolved Gas Analysis. Bottles shall be robust enough, so that no damage occurs during frequent transportation of samples from site to laboratory.

2.2 Oil Sampling bottles shall be made of stainless steel having a capacity of 1 litre.

2.3 Oil Sampling bottles shall be capable of being sealed gas-tight and shall be fitted with cocks on both ends.

2.4 The design of bottle & seal shall be such that loss of hydrogen shall not exceed 5% per week.

2.5 An impermeable oil-proof, transparent plastic or rubber tube of about 5 mm diameter, and of sufficient length shall also be provided with each bottle along with suitable connectors to fit the tube on to the oil sampling valve of the equipment and the oil collecting bottles respectively.
## Annexure -C

### Test Plan

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Test</th>
<th>Um</th>
<th>Um</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Measurement of winding resistance</td>
<td>≤ 170kV</td>
<td>≥ 170kV</td>
</tr>
<tr>
<td>2.</td>
<td>Voltage ratio measurement</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>3.</td>
<td>Polarity test</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>4.</td>
<td>No-load loss and current measurement</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>5.</td>
<td>Magnetic balance test (for three phase Transformer only)</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>6.</td>
<td>Impedance and load loss measurement</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>7.</td>
<td>Measurement of insulation resistance &amp; Polarization Index</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>8.</td>
<td>Measurement of insulation power factor and capacitance between winding and earth and Bushings</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>9.</td>
<td>Full wave lightning impulse test for the line terminals (LI)</td>
<td>Routine</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Induced voltage withstand test (IVW)</td>
<td>Routine</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>Applied voltage test (AV)</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>12.</td>
<td>Induced voltage test with PD measurement (IVPD)</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>13.</td>
<td>On-load tap changer test (Ten complete cycle before LV test)</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>15.</td>
<td>Core assembly dielectric and earthing continuity test</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>16.</td>
<td>Oil leakage test on transformer tank</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>17.</td>
<td>Appearance, construction and dimension check</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>18.</td>
<td>Short duration heat run test (Not Applicable for unit on which temperature rise test is performed)</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>19.</td>
<td>Measurement of no load current &amp; Short circuit Impedance with 415 V, 50 Hz AC.</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>20.</td>
<td>Frequency Response analysis (Soft copy of test report to)</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>No.</td>
<td>Test Description</td>
<td>Routine</td>
<td>Type</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------</td>
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</tr>
<tr>
<td>21.</td>
<td>High voltage withstand test on auxiliary equipment and wiring after assembly</td>
<td></td>
<td>Routine</td>
</tr>
<tr>
<td>22.</td>
<td>Tank vacuum test</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>23.</td>
<td>Tank pressure test</td>
<td>Routine</td>
<td>Routine</td>
</tr>
<tr>
<td>24.</td>
<td>Chopped wave lightning impulse test for the line terminals (LIC)</td>
<td>Type</td>
<td>Routine</td>
</tr>
<tr>
<td>25.</td>
<td>Switching impulse test for the line terminal (SI)</td>
<td>Type</td>
<td>Routine</td>
</tr>
<tr>
<td>26.</td>
<td>Line terminal AC withstand voltage test (LTAC)</td>
<td>Routine</td>
<td>Type</td>
</tr>
<tr>
<td>27.</td>
<td>Measurement of transferred surge on LV or Tertiary as applicable due to HV lightning impulse and IV lighting impulse (as applicable)</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>28.</td>
<td>Lightning impulse test for the neutral terminals (LIN)</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>29.</td>
<td>Temperature rise test</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>30.</td>
<td>Measurement of Zero seq. reactance (for three phase Transformer only)</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>31.</td>
<td>Measurement of harmonic level in no load current</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>32.</td>
<td>Measurement of acoustic noise level</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>33.</td>
<td>Measurement of power taken by fans and oil pumps (Not applicable for ONAN)</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>34.</td>
<td>Dynamic Short circuit withstand test (If specified in BPS)</td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td>35.</td>
<td>Tests on OLTC As per standards IEC 60214</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Tests on air cell as per standards</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Annexure - D

Test Procedures

General

Tests shall be carried out as per following procedure. However, IEC 60076 shall be followed in general for other tests. Manufacturer shall offer the transformer unit for type testing with all major fittings including radiator bank, Marshalling Box, Common Marshalling Box RTCC (as applicable) assembled.

1. Core assembly dielectric and earthing continuity test

After assembly each core shall be tested for 1 minute at 2000 Volts between all yoke clamps, side plates and structural steel work (core to frame, frame to tank & core to tank).

The insulation of core to tank, core to yoke clamp (frame) and yoke clamp (frame) to tank shall be able to withstand a voltage of 2 kV (DC) for 1 minute. Insulation resistance shall be minimum 1 GΩ for all cases mentioned above.

2. Measurement of winding resistance

After the transformer has been under liquid without excitation for at least 3 h, the average liquid temperature shall be determined and the temperature of the winding shall be deemed to be the same as the average liquid temperature. The average liquid temperature is taken as the mean of the top and bottom liquid temperatures. Measurement of all the windings including compensating (in case terminal is available at outside) at normal and extreme taps.

In measuring the cold resistance for the purpose of temperature-rise determination, special efforts shall be made to determine the average winding temperature accurately. Thus, the difference in temperature between the top and bottom liquid shall not exceed 5 K. To obtain this result more rapidly, the liquid may be circulated by a pump.

3. No-load loss and current measurement

As per IEC 60076-1:2011 clause 11.5


The short-circuit impedance and load loss for a pair of windings shall be measured at rated current & frequency with voltage applied to the terminals of one winding, with the terminals of the other winding short-circuited, and with possible other windings open-circuited. The difference in temperature between the top and bottom liquid shall not exceed 5 K. To obtain this result more rapidly, the liquid may be circulated by a pump. Loss measurement for all combinations (HV-IV, HV-LV, IV-LV and at Normal and extreme taps).

5. Short term heat run test (Not Applicable for unit on which temperature rise test is performed)
In addition to the type test for temperature rise conducted on one unit, each cooling combination shall routinely be subjected to a short term heat run test to confirm the performance of the cooling system and the absence of manufacturing defect such as major oil flow leaks that may bypass the windings or core.

DGA samples shall be taken at intervals to confirm the gas evolution.

For ODAF or OFAF cooling, the short term heat run test shall be done with the minimum number of pumps for full load operation in order to shorten the temperature build up. Each short term heat run test is nevertheless expected to take about 3 hours.

For ODAF or OFAF cooled transformers an appropriate cross check shall be performed to prove the effective oil flow through the windings. For this purpose the effect on the temperature decay by switching the pumps off/on at the end of the heat run should demonstrate the effectiveness of the additional oil flow. Refer to SC 12, 1984 cigre 1984 SC12-13 paper by Dam, Felber, Preiniger et al.

Short term heat run test may be carried out with the following sequence:

Heat run test with pumps running but oil not through coolers.

- Raise temperature to 5 deg less than the value measured during temperature rise test.
- Stop power input and pumps for 6 minutes and observe cooling down trend
- Restart pumps and observe increased cooling trend due to forced oil flow

This test is applicable for the Transformer without Pump also (ONAN or ONAF rating). For such type of transformer test may be carried out with the following sequence:

Arrangement shall be required with pump of suitable capacity (considering the oil velocity) without cooler bank. Raise the oil temperature 20-25 deg C above ambient. Stop power input and pumps for 6 minutes and observe cooling down trend. Restart pumps and observe increased cooling trend due to forced oil flow.

6. **Temp. Rise Test as per IEC: 60076**

Gas chromatographic analysis on oil shall also be conducted before, during and after this test and the values shall be recorded in the test report. The sampling shall be in accordance with IEC 60567.

The temperature rise test shall be conducted at a tap for the worst combination of loading (3-Winding Loss) for the Top oil of the transformer.

3-Winding Loss = HV (Max MVA) + IV(Max MVA) + LV (Max MVA).

The Contractor before carrying out such test shall submit detailed calculations showing losses on various taps and for the three types of ratings of the transformer
and shall recommend the combination those results in highest temperature rise for the test.

The Temperature rise type test results shall serve as a “finger print” for the units to be tested only with short term heat run test.

Gas chromatographic analysis on oil shall also be conducted before, during and after this test and the values shall be recorded in the test report. The sampling shall be in accordance with IEC 60567.

Oil sample shall be drawn before and after heat run test and shall be tested for dissolved gas analysis. Oil sampling to be done 2 hours prior to commencement of temperature rise test. Keep the pumps running for 2 hours before and after the heat run test. Take oil samples during this period. For ONAN/ONAF cooled transformers, sample shall not be taken earlier than 2 hours after shut down. The acceptance norms with reference to various gas generation rates shall be as per IEC 61181.

The DGA results shall generally conform to IEC/IEEE/CIGRE guidelines.

i. **Test conditions for temperature rise test:**
   - This test shall be generally carried out in accordance with IEC 60076-2
   - For each cooling combination with cooler bank, tests shall be done on the maximum current tap for a minimum of 12 hours for ONAN/ONAF and 24 hours for ODAF or OFAF or ONAF2 with saturated temperature for at least 4 hours while the appropriate power and current for core and load losses are supplied.
   - The total testing time, including ONAN heating up period, steady period and winding resistance measurements is expected to be about 48 hours.
   - DGA tests shall be performed before and after heat run test and DGA results shall generally conform to IEC/IEEE/CIGRE guidelines.

ii. **Test records:**

   Full details of the test arrangements, procedures and conditions shall be furnished with the test certificates and shall include at least the following.

iii. **General:**
   - Purchaser’s order number and transformer site designation.
   - Manufacturer’s name and transformer serial number.
   - Rating of transformer
   - MVA
   - Voltages and tapping range
   - Number of phases
   - Frequency
   - Rated currents for each winding
   - Vector Group
• Cooling Type
• Measured no-load losses and load losses at 75° C.
• Altitude of test bay.
• Designation of terminals supplied and terminals strapped.

iv. Top oil temperature rise test:

A log of the following quantities taken at a minimum of 30 minute intervals:

• time
• Voltage between phases
• Current in each phase and total power
• Power in each phase and total power
• Ambient temperature
• Top oil temperature
• Cooler inlet and outlet oil temperatures
• Hot spot temperatures (make use of probes) (if applicable)
• Colour photographs of the four sides and top of the transformer together with the corresponding series of thermal images (colour) during starting of the test then after every four hours till the temperature stabilised and finally during temperature stabilised for each rating (ONAN/ONAF/OFAF or ONAN/ONAF1/ONAF2).

Notes:
The probes may be left in position provided the reliability and integrity of unit will not be jeopardized during its long life expectancy.

v. Winding temperature rise test

• Record the ‘cold’ resistance of each winding and the simultaneous top oil and ambient air temperatures, together with the time required for the effect to disappear.
• Record the thermal time constant of the winding.
• Log the half-hourly readings of the quantities as for the top oil temperature rise test.
• Provide a table of readings, after shut-down of power, giving the following information:
  a. Time after shut-down:
  b. Time increment:
  c. Winding resistance: At least 20 minutes reading
  d. Resistance increment:
• Provide a record of all calculations, corrections and curves leading to the determination of the winding temperatures at the instant of shut-down of power.
• Record any action taken to remedy instability of the oil surge device during initiation of the oil circulating pumps.
Temperature measurements as per special probes or sensors (fibre optic) placed at various locations shall also be recorded.

7. **Dielectric Tests**

Following Test shall be performed in the sequence given below as per IEC 60076-3:2013 clause 7.2.3 shall be followed:

a) Lightning impulse tests (LIC, LIN)
b) Switching impulse (SI)
c) Applied voltage test (AV)
d) Line terminal AC withstand test (LTAC)
e) Induced voltage test with partial discharge measurement (IVPD)

8. **Measurement of transferred surge on LV or Tertiary due to HV & IV Lightning impulse**

Following tests shall be carried out with applying 20% to 80% of rated Impulse & Switching impulse (upto 60% for IV, Sr. No. 7 & 8 of below table) voltage. Finally, measured value shall be extrapolated for 100% rated voltage.

Table for Transfer surge (Impulse) at Max, Nor. and Min. Voltage Tap

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Impulse Type</th>
<th>Voltage applied</th>
<th>Earthed Points</th>
<th>Open / not earthed point</th>
<th>Measurement Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FW</td>
<td>1.1</td>
<td>2.1, N &amp; 3.2</td>
<td>-</td>
<td>3.1</td>
</tr>
<tr>
<td>2</td>
<td>FW</td>
<td>1.1</td>
<td>2.1, N &amp; 3.1</td>
<td>-</td>
<td>3.2</td>
</tr>
<tr>
<td>3</td>
<td>FW</td>
<td>2.1</td>
<td>1.1, N &amp; 3.2</td>
<td>-</td>
<td>3.1</td>
</tr>
<tr>
<td>4</td>
<td>FW</td>
<td>2.1</td>
<td>1.1, N &amp; 3.1</td>
<td>-</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Similar tests to be conducted for switching surge transformer at Max, Nor. and Min. Voltage Tap.

Where
- 1.1 : HV Terminal
- 2.1 : IV Terminal
- 3.1 & 3.2 : LV or Tertiary terminal

**Acceptance criteria:** Transfer surge at Tertiary should not exceed 250kVp at any conditions for 400kV Voltage class Transformer. For other transformer it shall be below the impulse level of LV winding.

9. **Chopped wave & full wave lightning impulse test for the line terminals (LIC & LI) and Switching impulse test**
Chopped wave lightning impulse and switching impulse test shall be performed at normal and extreme taps on Unit-1, Unit-2 and Unit-3 respectively for 1-Ph unit, otherwise R ph, Y Ph and B Ph respectively for 3-Ph unit. All the parameters as per IEC shall be mentioned in the report.

10. **Measurement of power taken by fans and oil pumps (100 % cooler bank)**

Losses of each fan and pumps including spare shall be measured at rated voltage and frequency. Fans and Pumps shall be mounted with cooler bank as per approved drawing during measurement. Serial No, Applied voltage, measured current, frequency and make shall be furnished in the test report.

11. **Tank Tests**

   i. **Oil Leakage Test**

   All tanks and oil filled compartments shall be completely filled with air or oil of a viscosity not greater than that of insulating oil conforming to IEC 60296 at the ambient temperature and subjected to a pressure equal to normal head of oil plus 35 kN/sq.m (5 psi) measured at the base of the tank. This pressure shall be maintained for a period of not less than 12 hours for oil and 1 hour for air during which no leakage shall occur.

   ii. **Vacuum Test**

   All transformer tanks shall be subjected to the specified vacuum. The tank designed for full vacuum shall be tested at an internal pressure of 3.33 KN/Sq.m absolute (25 torr) for one hour. The permanent deflection of flat plate after the vacuum has been released shall not exceed the values specified below:

<table>
<thead>
<tr>
<th>Horizontal Length of flat plate (in mm)</th>
<th>Permanent deflection (in mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to and including 750</td>
<td>5.0</td>
</tr>
<tr>
<td>751 to 1250</td>
<td>6.5</td>
</tr>
<tr>
<td>1251 to 1750</td>
<td>8.0</td>
</tr>
<tr>
<td>1751 to 2000</td>
<td>9.5</td>
</tr>
<tr>
<td>2001 to 2250</td>
<td>11.0</td>
</tr>
<tr>
<td>2251 to 2500</td>
<td>12.5</td>
</tr>
<tr>
<td>2501 to 3000</td>
<td>16.0</td>
</tr>
<tr>
<td>Above 3000</td>
<td>19.0</td>
</tr>
</tbody>
</table>
iii. **Pressure Test:**

All transformer tanks, its radiator, conservator and other fittings together or separately shall be subjected to a pressure corresponding to twice the normal head of oil or normal oil head pressure plus 35 KN/sq.m whichever is lower, measured at the base of the tank and maintained for one hour. The permanent deflection of flat plates after the excess pressure has been released shall not exceed the figure specified above for vacuum test.

**12.** Dynamic short circuit withstand test shall be carried out as per IEC 60076-5. Dynamic short circuit test shall be carried out in HV-IV combination at nominal & extreme tap positions. For LV winding, dynamic short circuit shall be carried out either on HV-LV or IV-LV combination, whichever draws higher short circuit current as per calculation. Type tests shall be carried out before short circuit test. Following shall also be conducted before and after Short Circuit test:

i) Dissolved gas analysis
ii) Frequency response analysis
iii) All routine tests

Detail test procedure shall be submitted by contractor & shall be approved before short circuit test.

**13.** Routine test on bushings shall be done as per IEC 60137.
**SCHEDULE OF GUARANTEED PERFORMANCE AND TECHNICAL PARTICULARS OF 100MVA & 160 MVA POWER TRANSFORMERS**

(To be submitted by Bidders):

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name of Manufacturer.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Service.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Normal continuous rating in MVA under site conditions at all taps:</td>
<td>ONAN ONAF OFAF</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>HV Winding</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>LV Winding</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Tertiary winding</td>
</tr>
<tr>
<td>4.</td>
<td>Rated voltage:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>HV Winding</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>LV Winding</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Tertiary winding</td>
</tr>
<tr>
<td>5.</td>
<td>Rated Frequency</td>
<td>Hz</td>
</tr>
<tr>
<td>6.</td>
<td>Number of phases</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Type of transformer.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Connections:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>HV Winding</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>LV Winding</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Tertiary winding</td>
</tr>
<tr>
<td>9.</td>
<td>Connection symbols:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>HV – LV</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>HV – Tertiary</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>LV – Tertiary</td>
</tr>
<tr>
<td>10.</td>
<td>Tappings:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Range</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Number of steps</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Position of tapping on HT winding for high voltage variation.</td>
</tr>
<tr>
<td>11.</td>
<td>Reference ambient temperatures:</td>
<td>°C</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Maximum ambient air temperature</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Maximum daily average ambient air temperature</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Minimum ambient air temperature</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>Maximum yearly weighted average ambient temperature</td>
</tr>
<tr>
<td>12.</td>
<td>Maximum temperature rise over ambient temperature:</td>
<td>°C</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>In oil by thermometer</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>In winding by resistance</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Limit for hot spot temperature for which the transformer is designed.</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>Type and details of winding hot spot temperature detector.</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>Temperature gradient between windings</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>F</td>
<td>Type of maximum winding temperature indicator °C</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Voltage to earth for which the star point will be insulated KV</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>A Type of cooling.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B Cooling data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. Total number of fans in the cooling bank/banks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii. Total number of oil pumps.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii. Type, make and rating of each fan. KW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv. Type, make and rating of each oil pump motor</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Losses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A Fixed losses of 3 phase transformer at 75 °C KW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B Load losses of 3 phase transformer at 75 °C excluding cooler losses. KW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Cooler Losses:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. Fan losses KW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii. Oil Pump losses KW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D Heater losses KW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E Total losses of 3 phase transformer at max. attainable temperature (a plus b plus c plus d) KW</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Max. current density in winding at CMR.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A HV winding Amps/Sec.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B LV winding Amps/Sec.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Tertiary winding Amps/Sec.</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Impedance voltage at rated current, normal ratio and at 75 °C expressed as percentage of normal voltage, on 100MVA base, between:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A HV to LV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B HV to Tertiary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C LV to Tertiary</td>
<td></td>
</tr>
<tr>
<td>18.</td>
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### Technical Specification of Transformer

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<td></td>
<td></td>
</tr>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>B</td>
<td>75% load</td>
</tr>
<tr>
<td>C</td>
<td>50% load</td>
</tr>
<tr>
<td>D</td>
<td>25% load</td>
</tr>
</tbody>
</table>

26. A The minimum value of load at which the transformer will run at maximum efficiency. %

B Max. efficiency of the transformer %

27. Regulation at full load at 75°C

A At unity power factor %

B 0.8 power factor (lagging) %

28. Core Data

A Grade of core material used.

B Thickness of core plate laminations. mm

C Whether core laminations are grain oriented cold rolled.

D Details of oil ducts in core:

i. Whether in the plane and at right angle to the plane of winding.

ii. Across the plane of lamination.

E

i. Insulation of core lamination.

ii Insulation of core bolt.

iii Insulation of core bolt washers.

iv Insulation of core and plates.

F Type of core joints.

29. Flux density:

A Designed continuous flux density at normal taps. Tesla

B Operating continuous flux density at normal taps Tesla

C Designed max. operating flux density which the transformer can withstand for 1 minute at normal tap. Tesla

D Designed max. operating flux density which the transformer can withstand for 5 seconds at normal taps. Tesla

30. Inter-turn insulation extreme:

A Extent of extreme end turns reinforcement .

B Extent of end turns reinforcement.

C Extent of turns adjacent to tappings reinforced .

D Test voltage for 10 seconds, 50Hz interturn insulation test on (a)

E Test voltage for 10 seconds, 50Hz inter turn insulation test on (b)

F Test voltage for 10 seconds, 50Hz inter turn insulation test on (c)
## WINDINGS:

**A** Type of windings:
- i) HV winding
- ii) LV winding
- iii) Tertiary winding

**B** Insulation of HV winding

**C** Insulation of LV winding

**D** Insulation of Tertiary winding

**E** Insulation between HV & LV winding

## Continuous rating in KVA under following conditions

**A** At 50 deg C ambient air temperature at site

**B** At 40 deg C ambient air temperature at site

**C** At 30 deg C ambient air temperature at site

## Time for which transformer can run at rated capacity in case of failure of cooling equipment

## Width of Track-gauge

## Whether HV windings are interleaved

## Thickness of transformer Tank

- a) Sides
- b) Bottom

## Dimensions of 3 phase transformer:

- a) Max. height to top of bushings
- b) Over-all length
- c) Over-all breadth
38 | **Weight data of transformer components:**
---|---
a) | Weight of core | kg
b) | Weight of copper windings | Kg
c) | Weight of core & windings | Kg
d) | Weight of tank, fittings and accessories | Kg
e) | Weight of insulating oil in OLTC chamber | Kg
f) | Weight of insulating oil in main tank | Kg
g) | Total weight of the Insulating oil in the transformer including oil in the conservator and cooling system | kg
h) | Total weight of complete 3 Phase transformer | Kg
i) | Weight of transformer arranged for transportation | kg

39 | **Bushing Data**
---|---|---|---
---| **HV** | **LV** | **TERTIARY** | **HVN** | **LVN**
a) | Type of bushing Insulator |
b) | Weight of bushing Insulator (kg) |
c) | Quantity of oil in one bushing (Lts) |
d) | Minimum dry flashover voltage of bushing (KV) |
e) | Minimum we flashover voltage of bushing (KV)_t |
f) | Minimum impulse level (KV) |
g) | Voltage rating (KV) |
h) | Current rating (Amps) |
i) | Creepage distance in air (mm) |
j) | Recommended gap setting (mm) |
<p>| | |</p>
<table>
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<tr>
<td><strong>k)</strong></td>
<td>Free space required at top for removal of bushing (mm)</td>
</tr>
<tr>
<td><strong>40</strong></td>
<td>Bucholz relay:</td>
</tr>
<tr>
<td></td>
<td>Description, range of settings, schematic diagram etc.</td>
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<tr>
<td><strong>41</strong></td>
<td>Sudden pressure relay:</td>
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<tr>
<td></td>
<td>Description, data, range of settings, schematic diagram etc.</td>
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</tr>
<tr>
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<td>Total volume of the conservator</td>
</tr>
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<td>Cubic meters</td>
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<tr>
<td>b)</td>
<td>Volume of the conservator between the highest and lowest level</td>
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<tr>
<td></td>
<td>Cubic meters</td>
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<td>a)</td>
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<td>b)</td>
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<td>c)</td>
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<td><strong>46</strong></td>
<td>Details of On-load tap changing gear:</td>
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<tr>
<td>a)</td>
<td>Make</td>
</tr>
<tr>
<td>b)</td>
<td>Type</td>
</tr>
</tbody>
</table>
### Rating:

- i) Rated voltage
- ii) Rated current
- iii) Step voltage
- iv) Number of steps

### Control

### Auxiliary supply details

### Voltage control

### Line drop compensation

### Protective device

### Parallel operation

### Approximate overall weight

### Approximate overall dimensions

### Approximate overall quantity of oil

### Dispatch details:

- a) Approximate mass of heaviest package \(\text{kg}\)
- b) Approximate dimensions of largest package
  - i) Length \(\text{mm}\)
  - ii) Breadth \(\text{mm}\)
  - iii) Height \(\text{mm}\)

### Untanking height \(\text{mm}\)
SECTION – III

TECHNICAL SPECIFICATION OF NIFPES
FIRE PROTECTION SYSTEM

1.0 INTENT OF SPECIFICATION

This section covers the design and performance requirements of the following types of fire protection systems:

a) Nitrogen Injection Fire Prevention cum Extinguishing System

b) Portable Fire Extinguishers

1.1 It is not the intent to completely specify all details of design and construction. Nevertheless, the system design and equipment shall conform in all respects to high standard of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in a manner acceptable to the Owner. The system design shall also conform to TAC/ NFPA norms.

1.2 The scope of work includes complete installation of fire protection system wherever it is required.

1.3 The equipment offered shall comply with the relevant IEC. The equipment conforming to any other approved international standards shall meet the requirement called for the latest revision of relevant Indian Standard or shall be superior.

1.4 Ambient temperature for design of all equipment shall be considered as 50°C.

1.5 The successful bidder shall prepare detailed layout and piping drawing and also other drawing such as road, drainage, cable trench, switch yard layout, etc. as furnished by the Employer during detailed engineering.

2.0 NITROGEN INJECTION FIRE PREVENTION CUM EXTINGUISHING SYSTEM

2.1 General:

Provision of inbuilt Complete Nitrogen Injection Fire Prevention cum Extinguishing System

Nitrogen Injection System for the Protection of Transformers against fire due to an arc, during internal faults and external fires is required to be provided with the 160MVA & 315 MVA Transformers for preventing tank explosion.

2.2 The system should comprise the following :-

i). Fire Extinguishing Cubicle with base frame and containing, oil drain assembly, nitrogen cylinder, electric mechanical control unit for oil drain and nitrogen
release detections necessary for monitoring system flanges on top panel for connecting pipe connections from transformer, panel lighting etc.

ii). Control Box for monitoring system operation, automatic control and remote operation, with alarms, indication light switches, push buttons, audio signal, suitable for tripping and signaling on 220 V DC supply.

iii). Pre-stressed non-return valve (PNRV) working on transformer oil flow rate, with proximity switch for remote alarm indication and with visual position indicator.

iv). Required number of fire detectors rated for 141°C for heat sensing, each fitted with two number cable glands.

v). Signal box for terminating cable connections from PNRV and fire detectors.

vi). Pressure relief valve with limit switch.

2.3 The following arrangements are required to be made on the transformer Tank at the time of fabrication of the tank :-

i). Oil drain opening with pipe, flange and manual gate valve at about 120mm below the top cover. Pipe size DN125 for 160 MVA and higher ratings.

ii). Nitrogen Injection openings with pipe size DN 25 with flange and manual gate valve on tank sides at about 100-200 mm from the bottom plate.

iii). Flanges having 4 Nos. 18 dia. holes with pcd as 155mm and dummy pipe on the conservator pipe between buchholz relay and conservator tank manual gate valve, for fixing PNRV.

iv). Supply and welding of fire detector brackets on top cover.

v). Supply and welding of the brackets for fixing signal box at a suitable location on top cover or tank size wall.

2.4 The following jobs shall also be within the scope of the Contractor/Sub-Contractor :-

i). Civil work including oil pit and fire wall.

ii). Material handling facility for placing F.E. cubicle on plinth

iii). Required electric signals connections to control box except fire detectors and PNRV.

However all cabling, piping and any other material required shall be supplied by the manufacturer Installation and Pre-commissioning tests shall also be in the scope of Contractor/Sub-Contractor.
2.5 **ACTIVATION OF NIFPES:**

2.5.1 Mal-functioning of fire prevention / extinguishing systems is their major shortcoming which leads to interruption in power supply. The Contractor/Sub-Contractor shall ensure that the chances of malfunctioning of NIFPES are practically nil. To achieve this objective, the Contractor/Sub-Contractor shall work out his scheme of activating signals which, while preventing mal-operation, should not be too rigorous to make the operation of NIFPES impracticable in case of actual need. Transformer isolation shall be the mandatory pre-requisite for activation of the system in Automatic mode or Remote mode in the control room. In addition, at least following electrical-signals shall be provided in series for activating NIFPES.

2.5.2 **Auto Mode**

a) For Prevention of Fire : i) Differential Relay Operation  
   ii) Buchholz Relay parallel with Pressure Relief Valve or RPRR. (Rapid Pressure Release Relay)  
   iii) Tripping of all concerned breakers is a pre-requisite for initiation of system activation.

b) For Extinguishing Fire : i) Fire Detector  
   ii) Buchholz Relay paralleled with Pressure Relief Valve or RPRR.  
   iii) Tripping of all connected breakers is a pre-requisite for initiation of system activation.

2.5.3 **Manual Mode (Local/Remote)** : Tripping of all connected breakers is a pre-requisite for initiation of system activation.
2.5.4 **Manual Mode (Mechanical)**: Tripping of all connected breakers is a pre-requisite for initiation of system activation.

2.6 **General Description of NIFPES**

2.6.1 **Schematic of the System**

NIFPES should be a stand alone dedicated system for oil filled. It should have a fire extinguishing (FE) cubicle placed on a plinth at a distance of 6-10 mtrs. from the transformer. The F.E. cubicle may be connected to the transformer oil tank (near its top) and to the oil pit from its bottom through oil pipes with gate valves. The F.E. cubicle should house a pressurized nitrogen cylinder connected to the transformer oil tank (near its bottom). Cable connections are to be provided from signal box placed on the transformer to the control box in the control room and from control box to F.E. cubicle. Fire detectors placed at the top of transformer are to be connected in parallel to the signal box. The signal box may be connected to a pre-stressed non-return valve fitted between the conservator tank and Buchholz relay. Control box is also to be connected to relay panel is control room for system activation signals.

2.6.2 **Operation**

On receipt of all activating signals, drain of pre-determined quantity of oil commences thus removing high temp. top oil layer. Simultaneously nitrogen is injected under high pressure at a pre-fixed rate, string the oil thus bringing the temperature of top oil layer down. Nitrogen occupies the space created by oil drained out and acts as an insulating layer between the tank oil & fire on top cover. Pre-stressed non return valve blocks oil flow form conservator tank, thus isolating it & preventing aggravation of fire.

2.6.3 **System Components**

Broadly, NIFPES shall consist of the following components. It is emphasized that all components irrespective of their exclusion in the details given below, necessary for fast reliable & effective working of NIFPES shall be considered within the scope of supply.
2.6.4 **Fire Extinguishing Cubicle**

It shall be made of 3mm thick steel sheet, painted dark red from inside & outside with hinged split doors fitted with high quality tamper proof lock. It shall be complete with the base frame and the following :-

- Nitrogen gas cylinder with regulator and falling pressure electrical contact manometer
- Oil drain pipe with mechanical quick drain valve.
- Electro mechanical control equipment for oil drain and pre-determined regulated nitrogen release.
- Pressure monitoring switch for back-up protection for nitrogen release.
- Limit switches for monitoring of the system.
- Flanges on top panel for connecting oil drain and nitrogen injection pipes for transformer.
- Panel lighting (CFL Type)
- Oil drain pipe extension of suitable sizes for connecting pipes to oil pit.

2.7 **Control Box**

Control Box for monitoring system operation, automatic control and remote operation, with following alarms indication, light switches, push buttons, audio signal, line fault detection suitable for tripping and signaling on 220V DC supply:

- System on*
- PNRV open*
- Oil drain valve closed*
- Gas inlet valve closed*
- PNRV closed^
- Fire Detector Trip^  
- Buchholz Relay Trip^  
- Oil drain valve open^  
- Extinction in pressure^  
- Cylinder pressure low^  
- Differential relay trip^  
- PRV/RPRR trip^  
- Transformer trip^  
- System out of service
- Line fault free detector
- Line fault differential relay
- Line fault buchholz relay
- Line fault PRV
- Line fault transformer trip
- Line fault PNRV
- Auto/Manual/Off
- Extinction release on
- Extinction release off
- Lamp test
- Visual / Audio Alarm
- Visual / Audio alarm for DC supply fail

The signals marked (*) shall be in the topmost row of control box panel.
The signals marked (^) shall follow next.

2.8 Pre-stressed Non Return Valve (PNRV)
PNRV is to be fitted in the conservator pipe line between conservator & Buccholz replay. It shall have the proximity switch for remote alarm, indication and with visual position indicator. The PNRV should be of the best quality because malfunction of PNRV shall be of serious consequence as its closing leads to stoppage of breathing of transformer.

2.9 Fire Detectors
The system shall be complete with adequate number of fire detectors fitted on the top of oil tank, OLTC/Off ckt. Tap changer rated for 141°C for heat sensing each fitted with two no. cable glands (water proof/weather proof).

2.10 Signal Box
It shall be fitted on the transformer for terminating cable connections from PNRV & fire detectors and for further connection to the control box.

2.11 Cables
Fire survival cables, able to withstand 750°C, 4 core x 1.5mm sq. for connection of fire detectors in parallel shall be used.
Fire retardant low smoke (FRLS) cable 12 core x 1.5mm sq. for connection between transformer signal box/marshalling box to control box and control box to fire extinguishing cubicle shall be used.

Fire retardant low smoke (FRLS) cable 4 core x 1.5mm sq. for connection between control box to DC supply source and fire extinguishing cubicle to AC supply source, signal box marshalling box to pre-stressed non return valve connection on transformer shall be used.

2.12 Pipes

Pipes, complete with connections, flanges, bends, tees etc. shall be supplied alongwith the system.

2.13 Other items

a) Oil drain and nitrogen injection openings with gate valves on transformer tank at suitable locations

b) Flanges with dummy piece in conservator pipe between Buchholz relay and conservator tank for fixing PNRV.

c) Fire detector brackets on transformer top cover.

d) Spare potential free contacts for system activating signals i.e. differential relay, buchholz relay, pressure relief valve, transformer isolation (master trip relay).

e) Pipe connections between transformer to fire extinguishing cubicle and fire extinguishing cubicle to oil pit.

f) Cabling on transformer top cover for fire detectors to be connected in parallel and inter cabling between signal box to control box and control box to fire extinguishing cubicle

g) Mild steel oil tank with moisture proof coating with capacity as minimum 20% of total oil quantity of transformer, with water tight cover, to be place in the oil pit. This tank shall be provided with the manhole, air vent pipe through silica gel breather, drain valve and a spare gate valve at the top.

h) Gate valves on oil drain pipe & nitrogen injection pipe should be able to withstand full vacuum. A non-return valve shall also be fitted on nitrogen injection pipe between transformers & gate valve.
i) Pressure relief valve, wherever not fitted on the existing transformer, shall also be in the scope of supply of Contractor/Sub-Contractor, alongwith its installation.

j) The F.E. cubicle shall be painted with post office red colour (Shade 538 of IS-5). All the exposed parts i.e. pipes, supports, signal box etc. shall be painted with enameled paint.

2.14 Mandatory Spares

For each substation

- 1 No. fitted nitrogen cylinder (68 liter water Capacity)
- 1 set of hose pipes with fittings.
- Heat sensor assembly
- Fire survival cable sufficient for one system
- 1 no. PNRBV
- Limit switch for fire detector

For each system

- 3 no. fire detectors
- 1 no. thermostat
- 1 no. heating element

All other consumables / non-consumables necessary for complete system.

2.15 Modification on the transformer

No modification on the transformer shall be allowed which affects its performance (i.e. efficiency, losses, heat dissipation ability etc.), safety, life etc. or its any other useful parameter. This requirement shall be of paramount importance and shall form the essence of the contract.

However, in any case, performance of transformer should not be affected in any manner by having NIFPES system and the Contractor/Sub-Contractor shall give an undertaking to this effect. All pipes should be washed/rinsed with transformer oil. If any damage is done to the transformer and/or any connected equipment during installation & commissioning full recovery therefore shall be effected from the Contractor/Sub-Contractor, of NIFPES system.

It shall be solely the responsibility of Contractor/Sub-Contractor to install, carry out pre-commissioning tests & commission NIFPES at East of Loni.
indicated in this Specification, to the entire satisfaction of the Employer and/or his representative.

2.16 Interlocks

It shall be ensured that once the NIFPES gets activated manually or in auto mode, all the connected breakers shall not close until the system is actually put in OFF mode. Also PNRV shall get closed only if all the connected breakers are open.

2.17 Scope of work

Bidder to substations.

The bidder may visit the substations in order to prepare a realistic bid especially w.r.t.

a) The probable location of various components of NIFPES in consultation with DTL. The location of oil pit shall be such that the same could be used for other transformer of the substation to be covered under NIFPES. The possibility of common oil pit for the transformer at substation to be covered with NIFPES.

b) Required lengths of various pipes & cables.

c) The design of NIFPES to ensure that it does not interfere with general maintenance/other activities carried on the transformer & in the substation and provision of NIFPES on remaining transformers at the substation.

2.18 Technical Particulars

2.18.1 Fire Extinction period

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>On commencement of Nitrogen Injection</td>
<td>Maximum 30 seconds</td>
</tr>
<tr>
<td>From the moment of system activation to complete cooling</td>
<td>Maximum 3 minutes</td>
</tr>
<tr>
<td>Fire detectors heat sensing temperature</td>
<td>141°C</td>
</tr>
<tr>
<td>Heat sensing area</td>
<td>800mm radius</td>
</tr>
<tr>
<td>Pre-stressed non return valve setting for Operation</td>
<td>minimum 60 ltr. Per minute</td>
</tr>
<tr>
<td>Capacity of Nitrogen cylinder</td>
<td>Minimum 68 litre water capacity And shall hold</td>
</tr>
</tbody>
</table>
minimum 10 cubic Meter gas to 150 bar pressure.

Power Source:
Control Box : 220V DC
Fire extinguishing cubicle for lighting : 230V AC

Guaranteed technical particulars as per Section GTP shall be submitted alongwith the bid.
The bidder shall clearly specify the following in the bid:-
a) The maintenance and testing schedule for NIFPES.
b) All the steps required to be undertaken for restarting the transformer and connected equipment after operation and mal-operation (if any) of the NIFPES.
c) The process of venting nitrogen in case nitrogen pressure in the cylinder exceeds the stipulated maximum value.

2.19 Previous Experience for qualifying Bidder
The Bidder shall have a minimum experience of five years in the design, manufacturing, erection, testing and commissioning of nitrogen injection fire protection, system on power transformers of similar or higher rating. At least 6 sets of the system shall be in successful operation on power transformers on similar & higher ratings with at least three different organisations for a minimum period of the 2 years. The Bidder shall furnish the details of nitrogen injection fire prevention and extinguishing systems supplied by them so far giving order reference, name and address of the customer, indicating the dates of commissioning as well as performance certificate from customers, of successful and satisfactory operation for minimum two years.

2.20 CODES AND STANDARDS
The design and installation of complete fire protection system shall comply with the latest applicable Indian standards wherever Indian standards are not available relevant British / I.E.C. / codes shall be followed. The following standards / codes shall be followed in particular.

a) Approval certificate should be obtained from Loss Prevention Association (LPA).
b) National Fire Codes 1993 of National Fire Protection Association (NFPA) USA.

The entire fire protection system shall be designed, erected and commissioned in accordance with the regulation of Tariff. Advisory Committee (TAC). In the absence of TAC regulations NFPA regulation shall be adhered to.

2.21 TESTS

Type Tests
Type test reports including that for detectors along with declared response time as per TAC’s letter shall be submitted along with the tender.
Certificates of the test on the system carried out by national/international testing bodies & TAC’s approval, if any, shall also be submitted with the bid.

Factory Test
Tests will be carried out on individual equipment of the system, as applicable and the total system in the Contractor/Sub-Contractor’s workshop in presence of Employer’s representative.

Performance Test
Performance test of the complete system shall be carried out after complete erection at site by the Contractor/Sub-Contractor’s representative. These tests shall include simulation and verification of the response of the complete system without injection of the nitrogen gas.

Drawings and Manuals
Detailed layout drawing along with the equipment drawing & control ckt. Drawing shall be given by the bidder along with complete bill of materials. After awarding of contract, detailed dimensional drawing of the system complete bill of materials including location and size of plinth for cubicle and oil pit shall be submitted for Employer’s approval as per GCC.

2.22 DOCUMENTATION
All drawings shall conform to Internationals standards organization (ISO). All dimensions and data shall be in system International Units.
Bidder shall furnish four sets of following drawings alongwith the offer.

a) A detail write up on operation of the offered protection system also describing it’s effectiveness for quenching fire in an oil filled power transformer.

b) General outline drawing of the complete system with technical parameters.

c) Drawing showing clearances from ground and other live points of transformers and system.

d) The drawings showing the details of detectors to be provided on transformers.

e) Drawing indicating the details of fire alarm control panel.

f) Mounting details/Installation and commissioning instruction of system equipment.

h) The manufacturing of the equipments shall be strictly in accordance with the approved drawings and no deviation shall be permitted without the written approval of the Employer. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawing shall be at the Contractor/Sub-Contractor’s risk.

i) Approval of drawings / works by Employer shall not relieve the Contractor/Sub-Contractor of any of his responsibility and liability for ensuring correctness and correct interpretation of the drawings for meeting the requirements of the latest revision of applicable standards, rule and codes of practices and effective performance of the system. The Employer shall have the power to reject any work or material which in his judgment is not in accordance therewith.

3.0 PORTABLE FIRE EXTINGUISHERS

3.1 Intent of Specification

This specification lays down the requirement regarding fire extinguishers of following types:

Portable fire extinguishers.

a) Dry chemical powder type

b) Carbon Dioxide type
3.2 All the extinguishers offered by the Bidder shall be of reputed make and should have been approved by Tariff Advisory Committee of India or any other international authorities like FOC - London/NFPA-USA. Certificates to this effect shall be furnished by the Bidder. All extinguishers shall be ISI marked.

3.3 Adequate number of smoke detector and Portable Fire Extinguishers of Dry Chemical Powder and Carbon dioxide shall be provided in suitable location in control room building, GIS Hall and DG set room. These extinguishers will be used during the early phases of fire to prevent its spread and costly damage.

3.4 **Design and Construction**

3.4.1 All the portable extinguishers shall be of freestanding type and shall be capable of discharging freely and completely in upright position.

3.4.2 Each extinguisher shall have the instructions for operating the extinguishers on its body itself.

3.4.3 All extinguishers shall be supplied with initial charge and accessories as required.

3.4.4 Portable type extinguishers shall be provided with suitable clamps for mounting on walls or columns.

3.4.5 All extinguishers shall be painted with durable enamel paint of fire red colour conforming to relevant Indian Standards.

3.4.7 Dry chemical powder type extinguisher shall conform to IS: 2171.

3.4.8 Carbon Dioxide type extinguisher shall conform to IS: 2878.

3.5 **Tests and Inspection**

3.5.1 Particulars of shop tests and procedure shall be submitted to the Employer before hand for his approval.

3.5.2 A performance demonstration test at site of five (5) percent or one (1) number whichever is higher, of the extinguishers shall be carried out by the Contractor. All consumable and replaceable items require for this test would be supplied by the Contractor without any extra cost to Employer.

3.5.3 Performance testing of extinguisher shall be in line of applicable Indian Standards. In case where no Indian Standard is applicable for a particular type of extinguisher, the method of testing shall be mutually discussed and agreed to before placement of order for the extinguishers.
3.6 **Performance Guarantee**

The contractor shall guarantee all equipment supplied by him against any defect due to faulty design, material and workmanship. The equipment shall be guaranteed to operate satisfactorily at the rated conditions at site.

3.7 **Painting**

Each fire extinguisher shall be painted with durable enamel paint of fire red colour conforming to relevant Indian Standards
A. **OIL Container:-**

1. Capacity of tank shall be of 20% excluding free board as per requirement of the total oil capacity of the largest transformer in Sub Station.
2. Tank shall be of cylindrical shape and made of minimum 5 mm thick MS sheet.
3. Cylinder shall be placed with horizontal axis below ground level with adequate supporting frame of angles and channels at bottom and clamp on sides. The bottom frame shall be fixed firmly with bolts grouted in ground with cement concrete 1:2:4 (1cement: 2 coarse sand: 4 graded stone aggregate.
4. Tank shall have
   (i) 700 mm dia air tight manhole cover with gasket.
   (ii) Drainage/suction valve.
   (iii) Lifting hooks of suitable strength.
   (iv) Air vent pipe with through silica gel breather.
   (v) One no. drain/suction pipe DN 50 NB on topmost circular surface of tank.
   (vi) One no. drain pipe DN 150 NB on vertical flat surface of tank and
   (vii) All other accessories for functional requirement of tank.
5. Outside surface of tank shall be pained with black anti corrosive bitumastic paint (two or more coats on new work) and also oil resitive paint as per requirement.

B. **Chamber for OIL tank below GL :-**

1. Chamber shall be of rectangular in size having minimum 50 CM clearance on sides and top of the MS tank.
2. Bottom slab of the tank shall be of minimum 125 mm thick RCC 1:1.5:3 (1 cement :1.5coarse sand: 3 grade stone aggregate of 20 mm of nominal size) having reinforcement 12mm dia @ 175 center to center both ways ( TMT bars confirming to relevant IS codes).
3. Cement shall confirm to OPC 43 grade.
4. Water proofing compound @ 1 kg./bag cement as per CPWD specifications shall be mixed with the cement in RCC and plaster work..
5. Side walls of the chamber shall be brick masonry in cement mortar (1 cement: 4 Coarse sand) with bricks confirming to class designation 75 thickness of wall shall be given below.

   a) From GL to 500 mm below GL - 230 mm
   b) From 500 mm below GL to 1250 mm below GL - 345 mm.
   c) From 1250 mm below GL to 2000 mm below GL - 460mm
6. Complete inside face and outer surface up to 300 mm below of GL of wall shall be plastered with 15mm thick cement mortar 1:4 (1 Cement:4 fine sand) having neat cement punning on top of the plaster.

7. Top of brick wall shall have 100 mm thick coping in cement concrete 1:2:4 (1 cement:2Coarse sand : 4 graded stone aggregate 20 mm nominal size).

8. Space between wall and MS tank including bottom gasp and top of tank shall be filled with dry Jamuna sand after fixing of tank in chamber and on top of Jamuna sand gap shall be plugged with cement concrete 1:2:4 (1 cement :2Coarse sand : 4 graded stone aggregate) having minimum 125mm thickness.

9. All material and items shall confirm to CPWD specifications.

10. For 700mm dia. Of manhole of tank, round MS sheet of 700mm dia., 5mm thick and length as per requirement to be provided as attachment with tank.
BIDDING DOCUMENTS

FOR

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

DELHI TRANSCO LIMITED
(A Government of NCT of Delhi Undertaking)

VOLUME – III
BID FORM, ATTACHMENTS & PRICE SCHEDULE
BID FORMS

Bid Proposal Ref. No………………………   Date: ………………

Name of Package:  Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

To,

Delhi Transco Limited
Shakti Sadan, Kotla Road
New Delhi – 110002

Ladies and Gentlemen,

1.0 Having examined the Bidding Documents, including Amendment Nos. (Insert Numbers) dated ………………… the receipt of which is hereby acknowledged, we ____________, offer to design, test, deliver, install and commission (including carrying out Performance & Guarantee Test) the Facilities under the above-named package in full Conformity with the said Bidding Documents for the sum of:

(Amount in Words)
(Amount in Figures)

or such other sums as may be determined in accordance with the terms and conditions of the Bidding Documents.

“Note: Being a Two Part tender, bidders are required to submit the Bid Forms in Part –I as well as in Part -II. However, the prices shall be quoted only in the Bid Form to be submitted with Price Bid Part -II.”

2.0 ATTACHMENTS TO THE BID FORM

In line with the requirement of the Bidding Documents, we enclose herewith the following Attachments to the Bid Form:

(a) Attachment 1: Bid Security in the form of ………………….* for a sum of …………………………. (amount in words and figures) initially valid for a period of two hundred twenty five (225) days from the date set for opening of bids.

* Please fill in the alternative chosen in line with 23.3 Section-INB, Vol.-I, of the Bidding Documents.
(b) **Attachment 2:** A power of attorney duly authorized by a Notary Public indicating that the person(s) signing the bid have the authority to sign the bid and thus that the bid is binding upon us during the full period of its validity in accordance with the INB Clause 24.

(c) **Attachment 3:** The documentary evidence that we are eligible to bid in accordance with Clause 10.3 (c) & (d) of INB are qualified to perform the contract if our bid is accepted. The qualification data has been furnished as per your format enclosed with the bidding documents.

(d) **Attachment 4:** The details of all major items of services or supply which we propose subcontractor in case of award, giving details of the name and nationality of the proposed subcontractor/ sub-vendor for each item.

(e) **Attachment 5:** The variation and deviations from the requirements of the Conditions of Contract as per INB and other commercial conditions, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.

(f) **Attachment 6:** The variation and deviations from the requirements of the Important Conditions of Contract as per INB, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.

(g) **Attachment 7:** The variation and deviations from the requirements of the Technical Deviation clauses mentioned in Volume-II, in your format enclosed with the Bidding Documents, including, inter alia, the cost of withdrawal of the variations and deviations indicated therein.

(h) **Attachment 8:** Additional information submitted by the bidder, in your format enclosed with the Bidding Documents, including, inter alia, indicated therein, if any.

(i) **Attachment 9:** Bought-out & Sub-contracted item listed with bidding documents.

(j) **Attachment 10:** Work Completion Attachment.

(k) **Attachment 11:** List of special tools & tackles listed with bidding documents.

(l) **Attachment 12:** Information regarding ex-employees of DTL in our firm.
(m) **Attachment 13:** Deleted

(n) **Attachment 14:** Price Adjustment Data

(o) **Attachment 15:** Guarantee Declaration (If applicable)

(p) **Attachment 16:** Integrity Pact, in a separate envelope duly signed on each page by the person signing the bid.

(q) **Attachment 17:** Undertaking for anti profiteering measures

(r) **Attachment 18:** Checklist (Bidder shall submit the information regarding documents submitted by them in the offer as per the checklist provided in Attachment-16 of Sec: Attachments, Vol-III of bidding document. It shall be sole responsibility of bidder to provide the information based on the documents submitted by them.)

### 3.0 Price Schedules

<table>
<thead>
<tr>
<th>Schedule 1</th>
<th>Price break-up Plant and Equipment (including Mandatory Spares) to be supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule 2</td>
<td>Break-up of Local Transportation, Insurance and other Incidental Services</td>
</tr>
<tr>
<td>Schedule 3</td>
<td>Price Breakup of Installation Charges</td>
</tr>
<tr>
<td>Schedule 4</td>
<td>Grand summary of the quoted bid price.</td>
</tr>
</tbody>
</table>

3.2 We are aware that the Price Schedules do not generally give a full description of the Work to be performed under each item and we shall be deemed to have read the Technical Specifications and other sections of the Bidding Documents and Drawings to ascertain the full scope of Work included in each item while filling-in the rates and prices. We agree that the entered rates and prices shall be deemed to include for the full scope as aforesaid, including overheads and profit.

3.3 We declare that as specified in the clause 11.2 CC of the Bidding Documents prices quoted by us in the Price Schedules shall be Fixed and Firm during the execution of Contract.

3.4 We understand that in the price schedules, where there are errors between the total of the amounts given under the column for the price Breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly. We further understand that where there are discrepancies between amounts stated in figures and amounts stated in words, the amount stated in words shall prevail. Similarly, any discrepancy in the total bid price and that of the summation of Schedule price (price indicated in a Schedule indicating the total of that schedule), the total bid price shall be corrected to reflect the actual summation of the Schedule prices.

3.5 We declare that items left blank in the Schedules will be deemed to have been included in other items. The TOTAL for each Schedule and the TOTAL of Grand
Summary shall be deemed to be the total price for executing the Facilities and sections thereof in complete accordance with the Contract, whether or not each individual item has been priced.

4.0 We confirm that except as otherwise specifically provided our Bid Prices include all taxes, duties, levies and charges as may be assessed on us, our Sub Contractor/Sub-Vendor or their employees by all municipal, state or national government authorities in connection with the Facilities, in and outside of India.

4.1 Deleted

4.2 We further understand that notwithstanding 4.0 above, in case of award on us, you shall also bear and pay/reimburse to us, Taxes, Duties and Levies as per GST rules in respect of transaction between you and us, imposed on the Plant & Equipment including Mandatory Spare Parts specified in Price Schedule to be incorporated into the Facilities; by the Indian Laws.

4.3 Deleted.

4.4 We confirm that we shall also get registered with the concerned Tax Authorities as per GST rules, in all the states where the project is located.

4.5 Deleted.

4.6 We confirm that TDS under the applicable laws shall be deducted by the Employer from the payments made to us and Employer shall issue TDS certificates in lieu of deductions so made.

5.0 CONSTRUCTION OF THE CONTRACT

5.1 We declare that we are making this offer on the basis of divisible Supply-cum-Erection Contract on a single source responsibility basis. The supply portion of the Contract will relate to the Supply of equipment and materials on the ex-works basis and the Erection portion will relate to transportation, storage, insurance, erection, testing and commissioning etc. of equipment/ materials as specified in the bidding documents. However, we have no objection in case Owner decides to split the above mentioned package into two separate Contracts—one Contract for Supply of all equipment on ex-works basis and second Contract for all services such as transportation & insurance, handling at site, storage, insurance, installation, testing and commissioning etc of equipment/materials as specified in the bidding documents.

We hereby declare that the award of two separate Contracts, will not, in any way, dilute our responsibility for successful completion of work and fulfillment of all obligations as per Bidding Documents and that both the Contracts will have a cross-fall breach clause i.e. a breach in one Contract will automatically be considered as a breach of the other Contract which will confer on the Owner the right to terminate the other Contract at our risk and cost and/or recover damages under any or both the Contracts.

6.0 PERFORMANCE GUARANTEE

We declare that the ratings and performance figures of the equipment to be furnished and erected by us are guaranteed. The Guaranteed particulars of different equipment are enclosed in Technical Data Sheets.
7.0 QUALIFICATION DATA

We confirm having submitted the Qualification Data in two Copies, as required by you in your Conditions of Contract in a separate envelope along with this Bid. Further we have filled in the information for qualification requirements in Attachment-3. In case you require any further information in this regard, we agree to furnish the same.

8.0 DEVIATIONS

8.1 We declare that the contract shall be executed strictly in accordance with the specifications and documents except for the variations and deviations, all of which have been detailed out exhaustively in the following Attachments, irrespective of whatsoever has been stated to the contrary elsewhere in our proposal.

a) Commercial Deviations Attachment - Attachment-5
b) Cost of withdrawal of deviation on Important/critical conditions Attachment - Attachment-6
c) Technical Deviations Attachment - Attachment-7

8.2 We confirm having noted Clause 11.2 of Section-INB, Conditions of Contract, Volume-I, as per which Bid containing deviations from following provision relating to following critical clauses will be treated as non-responsive, as stated therein. :

(a) Terms of Payment : Clause 12.0, CC, Vol.-I
(b) Bid Security : Clause 23.0, Section-INB, Vol.-I
(c) Contract Performance Guarantee : Clause 43.0, Section-INB, Vol.-I & Clause 13.0, CC, Vol.-I
(d) Liquidated Damages for Delay in completion : Clause 28.5, Section-CC, Vol.-I

8.2.1 We confirm that we have not taken any deviations / exceptions to above clauses.

8.3 Further, we agree that additional conditions, deviations, if any, found in the proposal documents other than those stated in attached Deviation Attachments (i.e., Attachment 5, 6 & 7), save that pertaining to any rebates offered, shall not be given effect to.

9.0 ADDITIONAL INFORMATION

We have included with this proposal additional information as listed in Attachment-8, We further confirm that such additional information do not imply any additional deviation beyond those covered in Attachment- 5, 6 & 7 and in case of any contradiction between these additional information and other provisions of Bid, the latter will prevail.
10.0 GUARANTEE DECLARATION

We guarantee that the equipment offered shall meet the rating and performance requirements stipulated in the specifications.

11.0 BOUGHT-OUT AND SUB-CONTRACTED ITEMS

We are furnishing herewith at Attachment-9, the detail of all major items of supply amounting to more than 10% of our bid price, which we propose subcontract giving detail of the name of sub-contractor / sub-vendor and quantity for each item.

12.0 WORK SCHEDULE

If this proposal is accepted by you, we agree to complete the entire scope of work as per the bidding documents, in accordance with schedule indicated in the proposal. We fully understand that the work completion schedule stipulated in this proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work is indicated in Attachment-10.

13.0 SPECIAL TOOLS AND TACKLES

We have given a list of Special Tools and Tackles in Attachment-11 and prices thereof are included in his lumpsum bid price. We further agree that any items of special tools and tackles, though not included in the aforesaid list, but required for effective erection, testing and commissioning & operation of the equipment for subject Transformer Package shall also be furnished by us at no extra cost to you.

14.0 CONTRACT PERFORMANCE GUARANTEE

We further agree that if our Bid is accepted we shall provide a Contract Performance Guarantee of value equivalent to ten percent (10%) of the total Contract Price valid upto the 90 days after the end of contract warranty period in the form of Bank Guarantees in your favour, as per the provisions of bidding documents and enter into a formal agreement with you, within thirty (30) days from the date of issue of Letter of Award of Contract.

15.0 INFORMATION REGARDING EX-EMPLOYEES OF DTL

We have furnished the details of Ex-employees of DTL, who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us, in Attachment-12.

16.0 CHECK LIST

We have included a checklist duly filled in Attachment-17

17.0 Deleted

18.0 We, hereby, declare that only the persons or firms interested in this proposal as principals are named herein and that no company, persons or firms other than mentioned herein have any interest in this proposal or in the Contract to be entered

Section I- Bid Forms Page 6 of 7
into, if we are awarded the Contract, and this proposal is made without any connection with any other persons, firm or party likewise submitting a proposal and that this proposal is in all respect for and in good faith, without collusion or fraud.

Dated this .................................. day of ................................ 20.....................

Thanking you, we remain

Yours faithfully

........................................................
(Signature of the authorized signatory®)

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

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

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

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

Place.............................................

Business Address:

Name and Address of Principal Officer

(Written Power of Attorney of all signatories of bid to commit the bidder must be enclosed with the bid.)
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

Bidder's Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

(Qualifying Requirement Data)

Dear Sir,

In support of the Qualification Requirements (QR) for bidders, stipulated in Annexure-A Conditions of Contract (CC), Volume-I of the Bidding Documents, we furnish herewith our QR data/details/documents etc., along with other information, as follows (The QR stipulations have been reproduced in italics for ready reference, however, in case of any discrepancy the QR as given in CC shall prevail):

We have submitted bid as a individual firm

A. Attached copies of original documents defining:
   a) The constitution or legal status;
   b) The principal place of business;
   c) The place of incorporation (for bidders who are corporations); or the place of registration and the nationality of the Owners (for applicants who are partnerships or individually-owned firms).

B. Attached original & copies of the following documents.
   a) Written power of attorney of the signatory of the Bid to commit the bidder.

1.0 General Information

Where the Bidder proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of 10 percent of the bid price, the following information should also be furnished for the subcontractor(s).

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>For Individual Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the Firm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Head Office/ Registered Office Address</td>
<td></td>
</tr>
</tbody>
</table>
3. Telephone
4. Fax
5. Contact Person
6. Place of Incorporation/ Registration
7. Year of Incorporation/ Registration
8. Authorized signatory of the bid
9. Whether copy of Power of Attorney of the signatory to commit the bidder is attached ○ Yes ○ No

(Necessary documents to establish legal status of the bidder should be enclosed with the bid)

2.0 Technical Requirement :- Bidder is required to submit the essential documents as per following requirements:
[Reference Annexure-A of the Conditions of Contract (CC), Volume-I]

2.1 Eligible Bidders
Qualification of bidder will be based on meeting the minimum pass/fail criteria specified below regarding the Bidder’s technical experience and financial position as demonstrated by the Bidder’s responses in the corresponding Bid Schedules.

The Employer may assess the capacity and capability of the bidder, to successfully execute the scope of work covered under the package within stipulated completion period. This assessment shall inter-alia include (i) document verification; (ii) bidder’s work/manufacturing facilities visit ; (iii) manufacturing capacity, details of works executed , works in hand , anticipated in future & the balance capacity available for the present scope of work ; (iv) Details of plant and machinery, manufacturing and testing facilities, manpower and financial resources; (v) Details of quality systems in place ; (vi) past experience and performance ; (vii) customer feedback ; (viii) banker’s feedback etc.

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

2.2 Technical Experience

2.2.1 The bidder should have designed, manufactured, tested, supplied, installed and commissioned 220 kV or above voltage class transformers of at least 100 MVA capacity. Transformers should have been in satisfactory operation for atleast two (2) years as on the originally scheduled date of bid opening.

2.2.2 The 220 kV or above class transformer manufacturer(s) who have established production line in India for these equipment(s) based on technological support of a parent company or collaborator for the respective equipment(s) can also be considered provided.
i) Such manufacturer has designed, manufactured, tested, supplied, installed and commissioned 220kV or above class transformers.

ii) The parent company (Principals) or collaborator meets qualifying requirements stipulated at para 2.2.1 above; and

iii) The 220kV or above class transformer manufacturer(s) furnishes

   a) a legally enforceable undertaking (jointly with the parent company or collaborator) to guarantee quality, timely supply, performance and warranty obligations as specified for the equipment(s); and

   b) a confirmation letter from the parent company or collaborator along with the bid stating that Parent company or collaborator shall furnish performance guarantee for an amount of 10% of the cost of such equipment(s). This performance guarantee shall be in addition to Contract Performance Guarantee to be submitted by the Bidder.

   In case bidder is a holding company, the technical experience referred to in clause 2.2.1 and 2.2.2 above shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 2.2.1 and 2.2.2 above shall be of that subsidiary company only (i.e. excluding its holding company).

2.2.3 Using the following format, the bidder is requested to furnish details of previous experience against the requirements detailed at para 2.2.1 & 2.2.2 above, on the basis of which the bidder wishes to qualify. The information is to be summarized using following format for each previous experience of the bidder.

   (The bidder shall attach documentary evidence, such as copies of utility certificates for completed contracts and copies of award letters etc. for ongoing contracts in support of his experience as listed in the following performa for each contracts).

Format-A for the bidders who wish to qualify through route 2.2.1 and for Parent Company (Principals) or collaborator of bidder who want to qualify through route 2.2.2:

<table>
<thead>
<tr>
<th>Name of the Bidder (Single Firm(as per 2.2.1 above)/Name of Parent Company (Principals) or collaborator(as per 2.2.2 above)</th>
<th>Name of Contract Undertaken</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Contract Reference No. &amp; Date of Award</td>
<td></td>
</tr>
<tr>
<td>b. Name and Address of the Employer/Utility for whom the Contract was executed by bidder/ Parent Company (Principal) or collaborator</td>
<td>E-mail ID:  ..................</td>
</tr>
<tr>
<td></td>
<td>Telephone No: ..................</td>
</tr>
<tr>
<td></td>
<td>Fax No:  ..........................</td>
</tr>
<tr>
<td></td>
<td>Voltage Level of Transformer supplied under the Contract (Indicate Only 220 kV or above class)</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>No. of Transformer(s) under the contract (indicate nos. of 3 phase Transformer with rating not less than 100 MVA capacity)</td>
</tr>
<tr>
<td></td>
<td>MVA capacity of the Transformer</td>
</tr>
<tr>
<td></td>
<td>Name of the substation or switchyard</td>
</tr>
<tr>
<td></td>
<td>Type of cooling of above Transformer</td>
</tr>
<tr>
<td>e.</td>
<td>Scope of work executed under the above contract (Tick only whichever is/are applicable)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>Date of Commissioning of above Transformer</td>
</tr>
<tr>
<td>g.</td>
<td>No. of years the above Transformer is in satisfactory operation as on the date of bid opening</td>
</tr>
<tr>
<td>h.</td>
<td>Details of documents furnished in the Bid, in support of the aforesaid data/details/information</td>
</tr>
</tbody>
</table>

**Format-B for the bidders (Manufacturers) who wish to qualify through route 2.2.2:**

<table>
<thead>
<tr>
<th></th>
<th>Name of the Bidder (Manufacturer)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Whether the bidder is a 220 kV class Transformer manufacturer, who has recently established production line in india for these equipment(s), based on technological support of parent company or collaborator for 220 kV class Transformer</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>Name of the Parent Company(Principals) or collaborator for 220 kV class Transformer (The qualifying data for parent company(Principals) or collaborator for the Transformer shall be furnished in Format-A)</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Date of Commissioning of above Transformers</td>
<td></td>
</tr>
</tbody>
</table>
d. Whether the 220 kV class Transformer or above class Transformer manufacturer(bidder) has furnished.
(Tick only whichever is/are applicable)

| Design | Manufacture | Supply | Testing | Installation & commissioning of 220 kV or above class Transformer |

| e(i) a legally enforceable undertaking (jointly with the parent company or collaborator) to guarantee quality, timely supply, performance and warranty obligations as specified for the equipment(s); and |
| |
| e(ii) a confirmation letter from the parent company or collaborator along with the bid stating that Parent company or collaborator shall furnish performance guarantee for an amount of 10 % of the cost of such equipment(s). This performance guarantee shall be in addition to Contract Performance Guarantee to be submitted by the Bidder. |
| f. Details of documents furnished in the Bid, in support of the aforesaid data/details/information |

3.0 FINANCIAL REQUIREMENTS:

3.1 FINANCIAL POSITION (Reference Annexure-A(CC))

The bidder should have adequate financial capability to meet the following minimum criteria:

a) Net Worth for last 3 financial years should be positive.

b) Minimum Annual Average Turnover* (MAAT) for best three years out of last five financial years of the bidder should not be less than-

\[
\text{MAAT (Rs.)} = \text{Rs. 82,50,97,926.86/-}
\]

* Annual total income as incorporated in the profit and loss account excluding non-operating income, i.e. sale of fixed assets etc.

c) Bidder shall have Liquid Assets (LA) or/and evidence access to or availability of credit facilities not less than-

\[
\text{LA (Rs.)} = \text{Rs. 13,75,16,321.14/-}
\]

**Note:** In case completion period is less than one (1) year the denominator to calculate MAAT and LA shall be considered as one (1) and twelve (12) respectively. The bidders are required to submit Annual Financial Report (Balance Sheet and Profit & Loss A/C) of last five financial years (from original bid opening date). Annual
financial statement should be duly certified by a Chartered Accountant for last five financial years and counter signed by bidders/Authorized signatory.

In case, bidder is a holding company, financial position criteria referred to in clause 3.1 above shall be that of holding company only (i.e. excluding its subsidiary / group companies). In case, bidder is a subsidiary of a holding company, financial position criteria referred to in clause 3.1 above shall be that of subsidiary company only (i.e. excluding its holding company).

### 3.2 Financial Qualification Data:

**A**  
**Turnover details:**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Financial Year</th>
<th>Turnover (in Millions)</th>
<th>Details of documentary evidence submitted in support of Qualification Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2016-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2015-16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2014-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2013-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2012-13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Average Annual Turnover for best three years is</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Financial Year</th>
<th>Net Worth (in Millions)</th>
<th>Details of documentary evidence submitted in support of Qualification Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2016-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2015-16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2014-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2013-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2012-13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C**  
**Liquid Assets**

<table>
<thead>
<tr>
<th>Details of evidence of having Liquid assets (LA)</th>
<th>LA</th>
</tr>
</thead>
</table>

Or

| Details of evidence of access to or availability of credit facilities | |
4.0 The Bidder shall also furnish following documents/details with its bid.

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

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

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

4.2 The bidder should accordingly also provide the following information/documents:

Audited balance sheet and income statements for the last five years as per the following:

<table>
<thead>
<tr>
<th>Years preceding to the bid opening</th>
<th>Audited Balance Sheet and Income Statements enclosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year</td>
<td></td>
</tr>
<tr>
<td>2nd Year</td>
<td></td>
</tr>
<tr>
<td>3rd Year</td>
<td></td>
</tr>
<tr>
<td>4th Year</td>
<td></td>
</tr>
<tr>
<td>5th Year</td>
<td></td>
</tr>
</tbody>
</table>

Date:       Printed Name:
Place:       Designation:
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

Bidder's Name & Address:

To,

DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

LIST OF APPROVED SUBCONTRACTORS

Prior to award of Contract, the following details shall be completed indicating those subcontractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. No Subcontractors shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

<table>
<thead>
<tr>
<th>Item of Facilities</th>
<th>Approved Subcontractors</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(Commercial Deviations)

Bidder’s Name & Address: 

To,

DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in

Dear Sirs,

Sub. : Commercial Deviations for ...........(Name of package ) .................

The following are the Commercial Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

<table>
<thead>
<tr>
<th>Volume/Clause</th>
<th>Ref./Page No.</th>
<th>As specified in the specification</th>
<th>Commercial deviation and variation to the specification</th>
<th>Withdrawal Price in Rupees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<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.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(DEVIATIONS ON IMPORTANT CONDITIONS)

Bidder's Name & Address:

To,

DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: se.jangir@dtl.gov.in.

Dear Sirs,

Sub. : Deviation on Important Conditions along with their withdrawal price.

The following are the Deviations/variations/exceptions to the provisions of important conditions stipulated in Clause 11.2 of INB, Conditions of Contract, Volume-I. We undertake to execute the contract in line with the provisions of bidding documents in respect of above said clauses in case DTL agree to pay us the withdrawal price indicated below against each such deviations/variations/exceptions.

<table>
<thead>
<tr>
<th>Volume of bidding document</th>
<th>Section</th>
<th>Clause No.</th>
<th>Page No.</th>
<th>Statement of deviations/variations/exceptions</th>
<th>Withdrawal Price in Rupees</th>
</tr>
</thead>
</table>

Date : ..................................................  
Place : ..................................................  
(Designation) .........................................  
(Common Seal) ...........................................

Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

Dear Sir,

Sub. : Technical Deviations for Package ……………………..( Name of Package)……………………………..

The following are the Technical Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except for these deviations, the entire work shall be performed as per your specifications and documents.

<table>
<thead>
<tr>
<th>Volume/Clause</th>
<th>Ref./Page No.</th>
<th>As specified in the specification</th>
<th>Technical deviation and variation to the specification</th>
<th>Withdrawal Price in Rupees</th>
</tr>
</thead>
</table>

Date : (Signature) ..................................................
Place : (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.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(Additional Information)

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
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<td></td>
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<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.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(BOUGHT-OUT & SUB-CONTRACTED ITEMS)

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

We hereby furnish the details of the items/sub-assemblies; we propose to buy for the purpose of subject package.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item Description</th>
<th>Quantity Proposed be bought/Sub-contracted</th>
<th>Source of Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Signature) ...................................................
(Printed Name) ............................................
(Designation) .............................................
(Common Seal) .............................................

Date :
Place :
Note : Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(WORK COMPLETION SCHEDULE)

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

We hereby declare that the following Work Completion Schedule shall be followed by us for the subject package.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Work</th>
<th>Period in Months (from the date of Award of Contract)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Completion of detailed engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Procurement of equipment &amp; raw materials</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Manufacturing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Shipments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Establishment of site office</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Receipt at final destination at site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Erection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Testing &amp; Commissioning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Commencement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Completion</td>
<td></td>
</tr>
</tbody>
</table>

Note: The transformers delivery and it’s erection, testing & commissioning may be relocated within the Delhi.

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.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(LIST OF SPECIAL TOOLS & TACKLES)

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

We hereby furnish below the list of special tools & tackles for erection and commissioning of equipment for the subject package. The prices for these tools & tackles are already included in the lumpsum bid price.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>For Equipment</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
</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.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(INFORMATION REGARDING EX-EMPLOYEES OF “DTL”)

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

We hereby furnish the details of Ex-Employees of DTL who had retired/resigned at the level of General Manager and above from DTL and subsequently have been employed by us.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Person with designation in DTL</th>
<th>Date of Retirement/resignation from DTL</th>
<th>Date of joining and designation in our Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

(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.
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(PRICE ADJUSTMENT DATA)
NOT APPLICABLE
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(GUARANTEE DECLARATION)

Bidder's Name & Address:

To,

DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

Dear Sirs,

We declare that the ratings and performance figures of 160 MVA, 220/66/11 kV three phase Power Transformer furnished by us for subject package covered under this specification are guaranteed. We further declare that in the event of any deficiencies in meeting the guarantees in respect of the characteristics mentioned below as established after conducting the factory test, you may at your discretion, reject or accept the equipment after assessing the liquidated damages as specified in the relevant clauses of Bid document.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Guaranteed Losses at rated output (KW) per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Copper Loss at 75°</td>
</tr>
<tr>
<td>160 MVA Power Transformer</td>
<td></td>
</tr>
</tbody>
</table>

Date:....................  (Signature).................................................................
Place:....................  (Printed Name)......................................................
(Designation).................................................................
(Common Seal).................................................................
Tender No.

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

(Integrity Pact)

(Signature of Bidder)………………

(Designation)…………………………

(Stamp)………………………….
Tender No.

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

**INTEGRITY PACT**

Between

Delhi Transco Limited

having its Registered Office at Shakti Sadan, Kotla Road, New Delhi -110 002

hereinafter referred to as

“DTL”

and

________________________________________

havin its Registered Office at ________________________________

________________________________________

and

________________________________________

havin its Registered Office at ________________________________

**Preamble**

DTL intends to award, under laid-down organisation procedures, contract(s) for

________________________________________

package

________________________________________

and Specification Number _________________________DL values full compliance with all relevant

________________________________________

(Signature)

(Signature)

(For & On behalf of DTL)

(For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Integrity Pact 1)
laws and regulations, and the principles of economical use of resources, and of fairness and transparency in its relations with its Bidders/Contractors.

In order to achieve these goals, DTL and the above named Bidder/Contractor enter into this agreement called ‘Integrity Pact’ which will form a part of the bid.

It is hereby agreed by and between the parties as under:-

Section I – Commitments of DTL

(1) DTL commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of DTL, personally or through family members or relative(s), will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for him/herself or third person, any material or other benefit which he/she is not legally entitled to.

(b) DTL will, during the tender process treat all Bidder(s) with equity and fairness. DTL will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or for the execution of contract.

(c) DTL will exclude form evaluation of Bids its such employee(s) who has any personnel interest in the Companies/Agencies participating in the Bidding/Tendering process.

The action stipulated in this Integrity Pact is without prejudice to any other Legal action that may follow in accordance with the provisions of the relevant law in force relating to any civil or criminal proceedings.

(2) If Managing Director obtains information on the conduct of any employee of DTL which is a criminal offence under the relevant Anti-Corruption Laws of India or illegal under the Indian Contract Act or Indian Laws, or if there be a substantive suspicion in this regard, he will inform its Chief Vigilance Officer and in addition can initiate disciplinary actions under its Rules.

Section II – Commitments of the Bidder/Contractor

(Signature) ________________________________ (Signature) ________________________________

(For & On behalf of DTL)  (For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal)  (Office Seal)
(1) The Bidder/Contractor commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

(a) The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to DTL, or to any of DTL’s employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange an advantage during the tender process or the execution of the contract.

(b) The Bidder/Contractor will not enter into any illegal agreement or understanding, whether formal or informal with other Bidders/Contractors. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or actions to restrict competitiveness or to introduce cartelization in the bidding process.

(c) The Bidder/Contractor will not commit any criminal offence under the relevant Anti-Corruption Laws of India, further, the Bidder/Contractor will not use for illegitimate purposes or for purposes of restrictive competition or personal gain, or pass on to others, any information provided by DTL as part of the business relationship, regarding plans, technical proposals and business details, including information of any type contained or transmitted electronically.

(d) The Bidder/Contractor of foreign origin shall disclose the name and address of the Agents/representatives in India, if any, involved directly or indirectly in the Bidding. Similarly, the Bidder/Contractor of Indian Nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the bidding.

(e) The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, or committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and/or with the execution of the contract.

(f) The Bidder/Contractor will not misrepresent facts or furnish false/forged documents/information in order to influence the bidding process or the execution of the contract to the detriment of DTL.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section III – Disqualification from tender process and exclusion from future contracts

(Signature) __________________________________ (Signature) ____________________

(For & On behalf of DTL) (For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal) (Office Seal)

Integrity Pact 3
(1) If the bidder, before contract award, has committed a serious transgression through a violation of Section II or in any other form such as to put his reliability or credibility as Bidder into question, DTL may disqualify the Bidder from the tender process or terminate the contract, if already signed, for such reason.

(2) If the Bidder/Contractor has committed a serious transgression through a violation of Section II such as to put his reliability or credibility into question, DTL may after following due procedures also exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder/Contractor and the amount of the damage. The exclusion will be imposed for a minimum of 12 months and maximum of 3 years and it has to be decided by the Competent authority.

(3) If the Bidder/Contractor can prove that he has restored/Recouped the damage caused by him and has installed a suitable corruption prevention system, DTL may revoke the exclusion prematurely with the approval of Competent Authority.

Section IV – Liability for violation of Integrity Pact

(1) If DTL has disqualified the Bidder from the tender process prior to the award under Section III, DTL may forfeit the Bank Guarantee under the Bid.

(2) If DTL has terminated the contract under Section III, DTL may forfeit the Contract Performance Guarantee of this contract besides resorting to other remedies under the contract.

Section V – Previous Transgression

(1) The Bidder shall declare in his Bid that no previous transgressions occurred in the last 3 years with any other Public Sector Undertaking or Government Department that could justify his exclusion from the tender process.

(2) If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section VI – Equal treatment to all Bidders/Contractors

(1) DTL will enter into agreements with identical conditions as this one with all Bidders.
(2) DTL will disqualify from the tender process any bidder who does not sign this Pact or violate its provisions.

**Section VII – Punitive Action against violating Bidders/Contractors**

If DTL obtains knowledge of conduct of a Bidder or a Contractor or his subcontractor or of an employee or a representative or an associate of a Bidder or Contractor or his Subcontractor which constitutes corruption, or if DTL has substantive suspicion in this regard, DTL will inform the Chief Vigilance Officer (CVO).

(**)Section VIII – Independent External Monitor/Monitors**

1. DTL has appointed a panel of Independent External Monitors (IEMs) for this Pact with the approval of Central Vigilance Commission (CVC), Government of India, out of which one of the IEMs has been indicated in the NIT/INV.

2. The IEM is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement. He has right of access to all project documentation. The IEM may examine any complaint received by him and submit a report to Managing Director, DTL at the earliest. He may also submit a report directly to the CVO and the CVC, in case of suspicion of serious irregularities attracting the provisions of the PC Act. However, for ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter shall be referred to the full panel of IEMs, who would examine the records, conduct the investigations and submit report to Managing Director, DTL, giving joint findings.

3. The IEM is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Managing Director, DTL.

4. The Bidder(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all documentation of DTL related to this contract including that provided by the Contractor/Bidder. The Bidder/Contractor will also grant the IEM, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his documentation. The same is applicable to Subcontractors. The IEM is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Sub-Contractor(s) with confidentiality.

5. DTL will provide to the IEM information as sought by him which could have an impact on the contractual relations between DTL and the Bidder/Contractor related to this contract.
(6) As soon as the IEM notices, or believes to notice, a violation of this agreement, he will so inform the Managing director, DTL and request the Managing Director, DTL to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the IEM shall give an opportunity to DTL and the Bidder/Contractor, as deemed fit, to present its case before making its recommendations to DTL.

(7) The IEM will submit a written report to the Managing Director, DTL within 8 to 10 weeks from the date of reference or intimation to him by DTL and should the occasion arise, submit proposals for correcting problematic situations.

(8) If the IEM has reported to the Managing Director, DTL a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Managing Director, DTL has not, within the reasonable time taken visible action to proceed against such offence or reported it to the CVO, the Monitor may also transmit this information directly to the CVC, Government of India.

(9) The word ‘IEM’ would include both singular and plural.

(*) This Section shall be applicable for only those packages wherein the IEMs have been identified in Section – I: Invitation for Bids and/or Clause 9 in Section –III : Conditions of Contract, Volume-I of the bidding documents.

Section IX – Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor after the closure of the contract and for all other Bidder’s six month after the contract has been awarded.

Section X – Other Provisions

(1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the establishment of DTL. The Arbitration clause provided in the main tender document/contract shall not be applicable for any issue/dispute arising under Integrity Pact.

(2) Changes and supplements as well as termination notices need to be made in writing.

(3) If the Contractor is a partnership firm or a consortium or Joint Venture, this agreement must be signed by all partners, consortium members and Joint Venture partners.
(4) Nothing in this agreement shall affect the right of the parties available under the General conditions of Contract (CC/GCC) and Special Conditions of Contract (SCC).

(5) Views expressed or suggestions/submissions made by the parties and the recommendations of the CVO/IEM in respect of the violation of this agreement, shall not be relied on or introduced as evidence in the arbitral or judicial proceedings (arising out of the arbitral proceedings) by the parties in connection with the disputes/differences arising out of the subject contract.

# CVO shall be applicable for packages wherein IEM are not identified in Section IFB/BDS of Condition of Contract, Volume-I. IEM shall be applicable for packages wherein IEM are identified in Section IFB/BDS of Condition of Contract. Volume-I

(6) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature) ______________________________ (Signature) _______________________

(For & On behalf of DTL) (For & On behalf of Bidder/Partner(s) of Joint Venture/Contractor)

(Office Seal) (Office Seal)

Name : __________________________ Name : __________________________

Designation: ______________________ Designation: ______________________

Witness 1 : ________________________ Witness 1 : ________________________

(Name & Address)_________________ (Name & Address)_________________

__________________________________ ____________________________________

__________________________________ ____________________________________

Witness 2 : ________________________ Witness 2 : ________________________

(Name & Address)_________________ (Name & Address)_________________

__________________________________ ____________________________________

__________________________________ ____________________________________
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

UNDERTAKING FOR ANTI PROFITEERING MEASURE

I/We(Mr./Ms.) ............................................. proprietor/partner/director of M/s..................................(GSTN Reg.No...........) do hereby declare that we have been complying with the provision of section 171 of the GST Act, 2017 and all the benefits accrued to us on account of any reduction in rate of tax and/or Input tax credit etc. on any supply of goods or services which will be supplied to DTL under LOA/PO No. __________will be passed on to Delhi Transco Limited by way of commensurate reduction in the prices. In future, if anything found contrary, we are accountable for any contravention of the law and we undertake to indemnify Delhi Transco Limited for the loss suffered on account of not passing the aforesaid benefit.

STAMP & SIGNATURE OF AUTHORIZED SIGNATORY
Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on Turnkey Basis.

*(CHECK LIST ATTACHMENT)*

Bidder’s Name & Address:

To,
DGM (T) CM
Delhi Transco Limited,
Room No.-504, Fifth Floor,
Shakti Sadan, Kotla Road
New Delhi – 110002
Phone Number: 011-23230026,
Fax No. 011-23234640
Email: sc.jangir@dtl.gov.in.

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

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item Description</th>
<th>Reference</th>
<th>Declaration (Strike out whichever is not applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bid Security enclosed (one original &amp; two copies)</td>
<td>Clause 23.0, Section INB, Vol. I</td>
<td>Yes/No</td>
</tr>
<tr>
<td>2.</td>
<td>Price Break-up (Plant and Equipment (including Mandatory Spares to be supplied) Schedule filled in</td>
<td>Price Schedule-1 of Schedule (one original &amp; two copies) Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>3.</td>
<td>Price Break-up (Local Transportation, Insurance &amp; other Incidental Services) Schedule filled in</td>
<td>Price Schedule-2 of Schedule (one original &amp; two copies) Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>4.</td>
<td>Price Break-up (Installation Charges) Schedule filled in</td>
<td>Price Schedule -3 Volume-III</td>
<td>Yes/No</td>
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<tr>
<td>5.</td>
<td>Price Break-up (Grand Summary of the Quoted Bid Price) Schedule filled in</td>
<td>Price Schedule -4 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>6.</td>
<td>QR data Attachment filled in</td>
<td>Attachment-3 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>7.</td>
<td>Commercial Deviations Attachment filled in</td>
<td>Attachment-5 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Item Description</td>
<td>Reference</td>
<td>Declaration (Strike out whichever is not applicable)</td>
</tr>
<tr>
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<td>--------------------------------------------------</td>
</tr>
<tr>
<td>9.</td>
<td>Deviations on Important Conditions Attachment filled in</td>
<td>Attachment-6 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>10.</td>
<td>Technical Deviations Attachment filled in</td>
<td>Attachment-7 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>11.</td>
<td>Additional Information Attachment filled in</td>
<td>Attachment-8 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>12.</td>
<td>Bought out and Sub-contracted items Attachment filled in</td>
<td>Attachment-9 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>13.</td>
<td>Work Completion Attachment filled in</td>
<td>Attachment-10 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>14.</td>
<td>Special Tools &amp; Tackle Attachment filled in</td>
<td>Attachment-11 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>15.</td>
<td>Information regarding Ex-employees of DTL</td>
<td>Attachment-12 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>16.</td>
<td>Price Adjustment</td>
<td>Attachment-14 of Volume-III</td>
<td>NA</td>
</tr>
<tr>
<td>17.</td>
<td>Guarantee Declaration</td>
<td>Attachment-15 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>18.</td>
<td>Integrity Pact</td>
<td>Attachment-16 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>19.</td>
<td>Bid Form</td>
<td>Bid Form of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>21.</td>
<td>Power of Attorney of Signatory Cl. 25.0, Section INB, Vol. I of Bid</td>
<td></td>
<td>Yes/No</td>
</tr>
<tr>
<td>23.</td>
<td>Undertaking for anti Profiteering measures</td>
<td>Attachment 17 of Volume-III</td>
<td>Yes/No</td>
</tr>
<tr>
<td>23.</td>
<td>Check List</td>
<td>Attachment-18 of Volume-III</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Date : ..................................................
Place : .............................................
(Signature) ...........................................
(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 Attachment.
Plant and Equipment (including Mandatory Spares) to be supplied

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>HSN Code</th>
<th>Whether HSN is confirmed, if not, indicate applicable the HSN code</th>
<th>Unit</th>
<th>Qty</th>
<th>Currency (INR)</th>
<th>Unit Price</th>
<th>Total Price</th>
<th>Mode of Transaction</th>
<th>Taxes &amp; Duties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>160 MVA, 220/66/11 kV Power Transformer including bushing, accessories for Transformer (Without Transformer Oil)</td>
<td>85042330</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>2</td>
<td>Transformer Oil for above Transformer with first filling of oil along with 10% extra oil (1 Lot = Oil for one Transformer with 10% extra oil)</td>
<td>27101960</td>
<td></td>
<td>Lot</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>17.5 kV NCT of ratio 800-400/1 Amp for 220 kV neutral of transformer</td>
<td>85359090</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>4</td>
<td>17.5 kV NCT of ratio 2000-1000/1 Amp for 66 kV neutral of transformer</td>
<td>85359090</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>5</td>
<td>Nitrogen Injection Fire Prevention &amp; Extinguishing System (NIFPES)</td>
<td>84248990</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
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</table>

Sub-Total (A)

<table>
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<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>HSN Code</th>
<th>Whether HSN is confirmed, if not, indicate applicable the HSN code</th>
<th>Unit</th>
<th>Qty</th>
<th>Currency (INR)</th>
<th>Unit Price</th>
<th>Total Price</th>
<th>Mode of Transaction</th>
<th>Taxes &amp; Duties</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Bushing of transformer</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>2</td>
<td>MV Bushing of Transformer with complete metal parts and gaskets.</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>LV Bushing of Transformer with complete metal parts and gaskets.</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>4</td>
<td>Set of gaskets.</td>
<td>85049010</td>
<td></td>
<td>Set</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>5</td>
<td>Sudden Pressure Relay Complete (SPR).</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>6</td>
<td>OTI</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>7</td>
<td>Buchholz Relay.</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
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<tr>
<td>8</td>
<td>CT for WTI</td>
<td>85049010</td>
<td></td>
<td>Nos.</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>9</td>
<td>Set of Oil Circulating Pump assembly complete with motor OFAF.</td>
<td>85049010</td>
<td></td>
<td>Set</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
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<tr>
<td>10</td>
<td>Oil Storage Tank</td>
<td>73090090</td>
<td></td>
<td>Nos.</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
</tr>
</tbody>
</table>

Sub-Total (B)

**GRAND TOTAL FOR SCHEDULE 1 i.e Total (A+B)**

Note: Bidder is required to quote prices in this Schedule for all the individual items/sub-items.

- Bidder’s Name and Address:
- HSN Code shall be filled by Bidder
- Currency shall be only in INDIAN Rupee in accordance with clause 14.2 Section-INB Volume I of the bidding documents.
- In case any additional equipment is required, the same shall be supplied without any additional payment and the offer should be complete and comprehensive.

Signature: ____________________________

Printed Name: ____________________________

Date: ____________________________

Designation: ____________________________

Place: ____________________________

Common Seal: ____________________________
### Price Schedule-2

#### Local Transportation, Insurance and other Incidental Services

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>Unit Qty</th>
<th>SAC Code</th>
<th>Whether SAC code is confirmed. If not, indicate applicable SAC code</th>
<th>Unit Charges (INR)</th>
<th>Total Charges (INR)</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
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</table>

#### Transport Service

<table>
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<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>Unit Qty</th>
<th>SAC Code</th>
<th>Whether SAC code is confirmed. If not, indicate applicable SAC code</th>
<th>Unit Charges (INR)</th>
<th>Total Charges (INR)</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Insurance and other Incidental Services

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>Unit Qty</th>
<th>SAC Code</th>
<th>Whether SAC code is confirmed. If not, indicate applicable SAC code</th>
<th>Unit Charges (INR)</th>
<th>Total Charges (INR)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Taxes & Duties

- **GST:**
  - Whether rate of GST is confirmed if not, indicate applicable rate of GST #
  - Amount

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>Unit Qty</th>
<th>SAC Code</th>
<th>Whether SAC code is confirmed. If not, indicate applicable SAC code</th>
<th>Unit Charges (INR)</th>
<th>Total Charges (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

---

**Note:**
- Bidder is required to quote prices in this Schedule for all the individual items/sub-items.
- SAC Code shall be filled by Bidder.
- Specify currency in accordance with clause 14.2 Section-INB Volume I of the bidding documents.
- In case any additional equipment is required, the same shall be supplied without any additional payment and the offer should be complete and comprehensive.

**Date:**

**Place:**
## Installation Charges

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Description</th>
<th>SAC Code</th>
<th>Whether SAC code is confirmed. If not, indicate applicable SAC code</th>
<th>Unit</th>
<th>Qty</th>
<th>Unit Charges (INR)</th>
<th>Total Charges (INR)</th>
<th>Taxes &amp; Duties</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>160 MVA, 220/66/11 kV Power Transformer including bushing, accessories for Transformer (Without Transformer Oil)</td>
<td>995468</td>
<td>Nos. 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Transformer Oil for above Transformer with first filling of oil along with10% extra oil. (1 Lot = Oil for one Transformer with 10% extra oil)</td>
<td>995468</td>
<td>Lot 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>17.5 kV NCT of ratio 800-400/1 Amp for 220 kV neutral of transformer</td>
<td>995468</td>
<td>Nos. 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>17.5 kV NCT of ratio 2000-1000/1 Amp for 66 kV neutral of transformer</td>
<td>995468</td>
<td>Nos. 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Nitrogen Injection Fire Prevention &amp; Extinguishing System(NIFPES)</td>
<td>995468</td>
<td>Nos. 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18%</td>
<td></td>
</tr>
</tbody>
</table>

### GRAND TOTAL FOR SCHEDULE 1

**Note:** Bidder is required to quote prices in this Schedule for all the individual items/sub-items.

1. SAC Code shall be filled by Bidder
2. Specify currency in accordance with clause 14.2 Section-INB Volume I of the bidding documents.
3. In case any additional equipment is required, the same shall be supplied without any additional payment and the offer should be complete and comprehensive.

**Date**

**Place:**

---

**TENDER NO. T17R220136**

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on

(Schedule of rates and prices)

Bidder's Name and Address:
TENDER NO. T17R220136

Power Transformer Package for Supply, Erection, Testing and Commissioning of 160 MVA Power Transformers for various Sub-Stations of DTL, Delhi on turnkey basis.

(Schedule of rates and prices)

Bidder’s Name and Address:

GRAND SUMMARY OF THE QUOTED BID PRICE.

<table>
<thead>
<tr>
<th>S.No</th>
<th>DESCRIPTION</th>
<th>Total Price (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TOTAL SCHEDULE NO. 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plant and Equipment (including Mandatory Spares) to be supplied</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TOTAL SCHEDULE NO. 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Local Transportation, Insurance and other Incidental Services</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TOTAL SCHEDULE NO. 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Installation Charges</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GRAND TOTAL 'A' = [ 1 + 2 + 3 ]</td>
<td></td>
</tr>
</tbody>
</table>

*currency in accordance with INR 14.2, Vol.-I of the Bidding Documents.*

II. We declare that the following are our quoted bid price in INR for the entire Scope of work as specified in the specifications and documents.

A. Quoted Bid Price:
   - i. In figures _________________________________________________
   - ii. In Words _________________________________________________
   Excluding taxes & duties
   (Grand Summary of the quoted Bid Price as in I above.)

B. Applicable Taxes & Duties and other levies, payable additionally, in respect of the transaction between the Owner and the Contractor (Total Amount to be mentioned).
   - i. GST (Total Amount to be mentioned)
     Estimated at the rate of ............................................
   - ii. Custom Duty (Total Amount to be mentioned)
     Estimated at the rate of ............................................
   - iii. Total taxes & duties(i+ii) : .....................................

C. Total Quoted Bid Price including Taxes and Duties and other levies, if contract is awarded to us i.e A+B above
   In figures:INR

Date: __________________________

Signature: __________________________

Place: __________________________

Printed Name __________________________

Designation __________________________

Common Seal __________________________

...