TENDER ENQUIRY

POWER SYSTEM OPERATION CORPORATION LIMITED
(A wholly owned subsidiary of Power Grid Corporation Of India Limited)
(A Government of India Enterprise)
NATIONAL LOAD DESPATCH CENTRE
B-9, Qutab Institutional Area, Katwaria Sarai,
N E W   D E L H I – 110016.

NIT No. 20 /2016

Tender Ref No. No. NLDC/C&M/SO/EMTP/2016   **Date: 23.11.2016**

To,

Dear Sir(s),

National Load Despatch Centre (NLDC) of Power System Operation Corporation Limited (POSOCO), New Delhi (A Wholly Owned Subsidiary of Power Grid Corporation of India Limited (A Government of India Enterprise) henceforth, POSOCO having its Office at B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi - 110016, intends to award a contract for Procurement of EMTP analysis Software at NLDC by inviting Limited Tender Enquiry (LTE).

1.0 For this purpose, Sealed Bids are invited from qualified parties. This Bid documents is comprised of the following documents

   1.   Special conditions of contract- Annexure-I
   2.   Technical Specification/ Scope of Work (Annexure-II)
   3.   Price Proposal (Annexure – III) including Deviation statement (Annexure – IV)
   4.   Tender Acceptance Letter (Annexure – V)

2.0 Tender details are as follows: **Important dates / times:**

   a)   For receipt of Tenders: **14.12.2016 (Wednesday) at 03:00 PM.**
   b)   For opening of Tenders**: 14.12.2016 (Wednesday) at 03:30 PM.**

Earnest Money Deposit (EMD): ₹ 5.24 (Rupees Five Lacs and Twenty Four Thousand) only. The original payment instrument like Demand Draft etc. as specified in this tender document has to be sent to the address the DGM (C&M), NLDC, Power System Operation Corporation Limited, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi by post/speed post/courier/by hand so that it reaches before Bid submission Closing Date & Time.

Bidders (MSEs: Micro and Small Enterprises) registered with NSIC shall be exempted from submitting Earnest Money Deposit/Bid Guarantee to the extent of monetary ceiling specified as per the Enlistment certificate/Competency certificate issued by NSIC Exemption. The exemption shall be provided subject to submission of Valid NSIC certificate wherein validity of certificate, the item for which they are registered & monetary ceiling must be specified clearly. Otherwise, the same shall not be considered for exemption.

JHUMA DAS
ENGINEER (C&M)
NLDC, POSOCO
jhumadas@posoco.in

Submission of Tender

The following documents are to be furnished by the Contractor along with Bid as per the tender document along with seal with authorised signatory:

i) Copy of valid registration certificate, experience certificate as per the tender notice, PAN No and Tender Acceptance Letter.

ii) Copy of previous three years Income-tax / VAT tax return / latest VAT and Income Tax Clearance Certificate, TIN No, Certificate / Affidavit of partnership firm.

iii) Copy of audited Balance sheet of last three years, certificate of profit and loss account, and Partnership deed as per the tender documents

iv) Copy of Deviation statement (if any) must be submitted for each quoted configuration

v) Scanned Copy of Any other document which the bidder may feel necessary to support the bid/product

vi) In addition to above, all the documents referred in Document Control Sheet (Annexure- I to V) may be downloaded and submitted along with the requisite EMD amount.

vii) Minimum computer requirements (including Hardware & Software) are required at RLDC/NLDC location to install the EMTP analysis software.

All the pages of bid being submitted must be signed and sequentially numbered by the bidder irrespective of nature of content of the documents before submission.

The offers submitted by Telegram/Fax/email shall not be considered. No correspondence will be entertained in this matter.

SCC (SPECIAL CONDITIONS OF CONTRACT)

1. Submission of tender by a Tenderer implies that he has read this notice and all other tender documents and has made himself fully aware of the scope and specifications of the work to be done and of conditions as well as of local conditions and other factors which may have bearing on the execution of the work. No claim for financial adjustment to the contract awarded under these specification and documents will be entertained by POSOCO / NLDC. Neither any change in the time schedule of the contract nor any financial adjustments arising there of shall be permitted by POSOCO, which are based on the lack of such clear information or its effect on the cost of the works to the Tenderer.

2. Power System Operation Corporation Limited (POSOCO) (A Wholly Owned Subsidiary of Power Grid Corporation of India Limited), does not bind them to accept the lowest or any tender or to give any reason for their decision.

3. Power System Operation Corporation Limited (POSOCO) (A wholly owned subsidiary of Power Grid Corporation of India Limited) shall return the amount of EMD without any interest to every unsuccessful bidder within 30 days from the date of acceptance of LOA to successful bidder.

4. **Bid Guarantee/EMD**: ₹ 5.24 **(Rupees Five Lakh Twenty Four Thousand) only.** EMD in the form of BG/DD/Bankers Cheque drawn in favour of Power System Operation Corporation Limited, payable at New Delhi from a reputed Commercial Bank/Financial Institute i.e. IFCI, IDBI, is to be submitted along with the bid. EMD of the unsuccessful bidder will be refunded only after finalization of contract. The successful bidder's EMD will be treated as initial security deposit and will be discharged upon the bidder's acceptance of the award and furnishing the contract performance qurantee/security deposit. Bid without EMD shall be liable for rejection. No interest will be payable on the above EMD. The bid guarantee shall be valid for a minimum period of **07(seven) Calender Months** from the date of opening of Bid.

    Earnest Money shall be forfeited in case of following :
    (a) On revocation of tender or increase in rates after opening of the tender but before the validity of the quotation expires.
    (b) On refusal to enter into a contract after the award of contract.
    (c) If the work is not commenced on the agreed/accepted date of starting the work after the same is awarded to the tenderer.

    Bidders (MSEs: Micro and Small Enterprises) registered with NSIC shall be exempted from submitting Earnest Money Deposit/Bid Guarantee to the extent of monetary ceiling specified as per the Enlistment certificate/Competency certificate issued by NSIC Exemption. The exemption shall be provided subject to submission of Valid NSIC certificate wherein validity of certificate, the item for which they are registered & monetary ceiling must be specified clearly. Otherwise, the same shall not be considered for exemption.

5. **Understanding of Documents**: The bidder is required to carefully examine the tender documents and fully understand the implications of the conditions and matters which may in any way affect the works or the cost, quality, or scheduled completion time thereof. Further, the bidder is also required to inspect the site of the work / equipment and ascertain for himself site / equipment conditions, facilities available and other aspects before quoting for the work. Any claims by the successful bidder at a later date on account of his failure to comply with the above instructions will not be entertained.

6. **Rate:** The Bidder shall quote in their tender:
   a) The unit rates for the respective items of bill of quantities as envisaged.
   b) The total amount of the individual items of bill of quantities as well.
   c) The sum of all such totals of bill of quantities for entire scope of work.

   The above prices shall remain FIRM and FIXED and hence no price variation shall be payable on any account whatsoever.

   The item rates that are quoted and indicated in the Bill of Quantities (**BOQ**) - include, interalia, all costs such as cost of necessary materials, their transportation to site, plants, site arrangement, overheads, govt. levies & taxes, insurance whatsoever as stipulated in the contract for the total scope of work under the contract. Nothing shall be payable extra over and above the quoted item rates.

7. **Deviations**: It is taken that the bidder shall accept all the terms & conditions mentioned in bid documents without any deviation. **However, the bidder who may have to deviate from terms & conditions of contract including technical specification(s) will have to bring out all their deviations in the Statement of Deviations (Schedule-I) and submit the same along with the bid copy.**

a) Deviations must be fully explained in this Statement of Deviations and the same should be stamped and signed by the Bidder. The last column of this statement should positively indicate the cost of withdrawing these conditions. These costs will be taken into considerations for purpose of evaluation. It may further be noted that in case of withdrawal of deviations maximum liability to the owner under the contract will not exceed the amount stipulated in the bid against respective deviation in the statement of deviation. **If there are no deviations the statement of deviation shall be returned as 'NIL' statement duly signed and stamped**.

b) Deviations mentioned or brought out elsewhere in the bid other than in the statement of deviation save for rebates will not be entertained and such offers which do not conform to the above requirements are liable to be rejected.

8. **Destination:** POSOCO, National Load Despatch Centre (NLDC), B-9, 1st Floor, Qutab Institutional Area, Katwaria Sarai, NEW DELHI - 110016

9. **Engineer-In-Charge:**
   For supervision & coordination of the above job DGM (SO) or his Authorized Representative(s) shall be the Engineer-In-Charge.

10. BASIS OF EVALUATION

10.1 The Owner will examine the bids to determine whether they are complete, whether the documents have been properly signed and whether the bids are generally in order..

10.2 Conditional discount/rebate, if any, offered by the Bidder shall not be taken into consideration for evaluation. It may, however, be considered in case of award.

10.3 Bids shall be evaluated and compared on the basis of total price for the entire scope of work under the package.

10.4 Evaluation of a bid, in addition to the total price as per Clause 10.3 above, will take into account - (i) the applicable taxes, duties, levies payable/ reimbursable by the Owner and (ii) "Cost Compensation for Deviations/Cost of Withdrawal of Deviations" which will be added to bid price

10.5 Arithmetical errors will be rectified on the following basis:

If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity of any item, or between sub-total and the total price, the unit or sub-total price shall prevail, and the total price shall be corrected. If there is a discrepancy between works and figures, the amount in words will prevail. Further, if there is a discrepancy between the quantity specified by POSOCO in the bidding document and that indicated by the bidder in his bid, the former shall be taken to arrive at the computed price. In case the unit rate of an item is not quoted but the total is indicated, the same shall be taken to arrive at the computed price. The computed price at, as above, shall be considered for the purpose of award also. It the bidder does not accept the correction of error, its bid will be rejected and the amount of Bid guarantee shall be forfeited.

11. Terms of Payment:
a) Supply portion
100 % (hundred percent) of the payment of the software would be released subject to the following condition
   a. Delivery & installation of software at RLDCs/NLDC locations
   b. Commissioning and operationalisation of software with demonstration to the Nodal officer at RLDCs/NLDC
   c. After issuance of 'Acceptance Test Procedure Certificate (ATP)', which will be issued by Nodal officers of RLDC/NLDC and   issuance of taking over certificate by engineer-in-charge
   d. Acceptance of CPG of vendor by POSOCO.

The said Bank Guarantee shall be kept valid till 90 days beyond the warranty period of one year.
Nodal officer, who will be accepting the licensees and issuance of 'Acceptance Test Procedure Certificate (ATP)', will be intimated after award of LOA.

b) **Services Portion**

Maintenance & Support (M&S) Charges: Applicable for 5 year from the expiry of warranty is for 12 licenses. However, at any time, the M&S charge for the purpose of payment shall be pro-rata to the total nos. of licenses at that time.

The annual M&S charges for a year during which M&S have been provided by vendor shall be paid on pro-rata completed quarterly basis. Vendor shall submit the invoice after completion of each quarter for corresponding value of M&S charges, duly certified by POSOCO's authorized official. POSOCO shall pay the said applicable quarterly M&S charges along with service tax within 30 days after submission of invoice and certification.

12. **Quantity Variation**
    During the execution of the contract, the Owner reserves the right to increase or decrease the quantities of items under the contract but without any change in unit price or other terms and conditions. Such variation shall not be subjected to any limitations for the individual items but the total variation in all such items under the   contract shall be limited to +/- 20 % (plus/minus twenty percent) of the total contract price.

13. **Work Schedule: 04(four)** weeks from date of Letter of award.

14. **Delivery schedule**
    The EMTP analysis software total 12 licensees shall be supplied, installed, commissioned and operationalised at RLDCs/NLDC location. (Two Licensees each at   NRLDC (New Delhi), NLDC (New Delhi), WRLDC (Mumbai), ERLDC (Kolkatta), SRLDC (Bangalore) and NERLDC (Shillong)).

15. **End user license Agreement**
    The End user license agreement establishing the purchaser's right to use the software throughout lifetime shall be signed by the user and supplier during the supply/installation of the product.

16. **Warranty**
    a) **Software**: The EMTP analysis software shall be warranted for one year commencing from the date of acceptance in all aspects of last license delivered at RLDC/NLDC location and certified by the Nodal officer of RLDC/ NLDC which in turn certified by Engineer In charge NLDC, POSOCO. However, in the event of delay in delivery of licenses by vendor, the warranties of corresponding licenses shall commence from the date of acceptance of said licenses by POSOCO. The said warranty provides that the software will satisfactorily and effectively perform the functions described in the technical specifications, software bulletins & brochures. vendor shall provide the requisite 'Maintenance and Support' of software by providing software updates & patches, higher version upgrades, technical support in resolving any technical queries and also assistance in modelling of various components of electrical equipment in electrical power system during warranty period of 12 months commencing from the date of delivery of all licenses Any Provisions of services during warranty period shall not have any additional cost implication to POSOCO.

b) Hardware: The USB hardware lock if supplied with software, if there is any problem in hardware USB lock, the same shall be replaced by vendor free of cost within 3 weeks of notification of problem by the user during warranty period and during Maintenance and support (AMC) period.

17. **Maintenance and Support (M&S)** (AMC) The vendor shall offer onsite AMC for a period of five years for all the packages included in the license vendor shall provide the requisite 'Maintenance and Support' of software by providing software updates & patches, higher version upgrades, technical support in resolving any technical queries and also assistance in modelling of various components of electrical equipment in electrical power system (*i.e.,* 12 license as per the subject contract) during 'maintenance & support, which shall remain valid for further five years from the expiry date of warranty period. After completion of one year of M&S after expiry of warranty period may review the M&S contract with vendor. After review, in the event POSOCO decides not to continue annual M&S contract with vendor, POSOCO reserve the right to terminate the M&S contract after expiry of any particular year and on such instant POSOCO shall not bear any additional liability whatsoever on account of such termination. POSOCO shall intimate such instance to vendor at least 1-quarter in advance prior to the termination of M&S contract.

    Hardware: The USB hardware lock if supplied with software, if there is any problem in hardware USB lock, the same shall be replaced by vendor free of cost within 3 weeks of notification of problem by the user during Maintenance and support (AMC) period.

18. **Validity of the Offer:** The offer submitted by the bidder should remain valid for acceptance for a period of Six Months (i.e., 180 Days) from the Date of Opening of Bids.

19. **Liquidated Damages (LD):** If the Contractor fails to perform the work within the specified period given in the Letter of Award or any extension thereof, with respect to successful completion of supplies, the Contractor shall pay to the Owner as Liquidated Damages and not a penalty, a sum of half percent [0.5%] of the contract price for the delayed portion for each calendar week of delay or part thereof in completion of works and handing over to the Owner. However, the amount of Liquidated Damages for the contract shall be limited to a maximum of Five Percent [5%] of the Total Contract Price.

20. **Contract Performance Guarantee / Security Deposit:** The successful bidder shall be required to furnish a Contract Performance Guarantee as Security Deposit (within 15 days from the date of LOA) for faithful performance of the contract equivalent to 10% (ten percent) of the Total Contract Price valid upto 90 days beyond the Completion of Work in the format given in Bidding Documents. If the Contractor does not furnish the Contract Performance Guarantee, the total amount of ₹ 5.24 (Rupees Five Lakh Twenty FourThousand) only deposited earlier by Contractor on account of Earnest Money Deposit (EMD) shall be adjusted against Security Deposit (SD) and balance SD will be recovered from our payment to the bill raised. The amount of Security Deposit will be released after 90 (Ninety) Days from the Date of Successful Completion of Work. The Date of Issue of Certificate in this regard, by the Engineer-In-Charge will be treated as the Date of Successful Completion of Work(s).

21. **Coordination with other Agencies**: The Contractor shall attend at his cost all the Meetings with the Engineer-In-Charge or the Contractors and the Consultants of the OWNER for the Contract. The Contractor shall attend such meeting as and when required and fully cooperate with such persons and agencies involved.

22. **Taxes & Duties:**
The Rates & Total contract price shall be exclusive of all Taxes, Service Taxes as may be applicable. POSOCO/NLDC shall deduct Income tax and other Statuary taxes at source, if applicable. Payment towards taxes & duties if already paid shall be released by POSOCO directly to vendor. With regard to the payment/ reimbursement of applicable VAT/CST & Service Tax, it is important to mention that in the event of delay in delivery of supply items and/or completion of services by vendor, the liability of POSOCO on account of VAT/CST and Service Tax shall be limited to applicable VAT/CST and/ or Service Tax as on scheduled date or actual date, whichever is lower.

23. NLDC reserves the right to modify/relax any of the terms & conditions of the tender by declaring / publishing such amendments in a manner that all prospective vendors / parties to be kept informed about it.

24. **Premature Termination of Contract:** POSOCO reserves the right to terminate the contract without assigning any reasons by giving a notice of 30 days in advance.

25. **Cancellation of contract in full or in part:** If the contractor:
a) At any time makes default in proceeding with the works with due diligence and continues to do so after a notice in writing of 07 days from the Engineer-In-Charge ; or
b) Commits default in complying with any of the terms & conditions of contract and does not remedy it or take effective step to remedy it within 07 days after a notice in writing is given to him in that behalf by the Engineer-In-Charge ; or
c) Fails to complete the works or items of work or before the stipulated date(s) of completion and does not complete item within the period specified in a notice given in writing by the Engineer-In-Charge.

26. **Arbitration:** In the event of any dispute or difference whatsoever arising under this contract or in connection therewith including any dispute relating to existing meaning and interpretation of this contract, the same shall be referred to the Sole Arbitrator or some other person as appointed by POSOCO (A Wholly Owned Subsidary of Power Grid Corporation of India Limited), New Delhi. The Arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996.

There will be no objection that the Arbitrator is a person who has dealt with the matters to which the contract relates and/or in the course of his duties he has expressed any view in any matters of dispute or differences. The award of the arbitrator shall be final and binding on the parties. Notwithstanding any dispute between the parties, the agency shall not be entitled to withhold, delay or defer his obligation, under the contract, and the same shall be carried out strictly in accordance with the terms and conditions of the contract. The Arbitrator shall give Reasonable Award with respect to the dispute referred to him by either of the parties.

27. **General Terms and Conditions of Contract (GCC) of POWERGRID are applicable for POSOCO.** (available in URL: http://posoco.in/side-menu-pages/tenders/limited-tender/).

28. All the Documents regarding the Tender Enquiry shall be addressed to :

AGM (C&M),   **Ph: 26524521**
Power System Operation Corporation Limited,
National Load Despatch Centre,
B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi - 110016.

29. All pages of the bid being submitted must be duly signed and stamped on each page and sequentially numbered by the Tenderer irrespective of the nature of content of the documents before submission. Cutting or overwriting, if any should be signed and stamped by the person signing the tender. All formats forming part of the tender document shall be filled in, signed and stamped by the Tenderer.

30. Tender bid must contains the name, office and after office hours addresses including telephone number(s) of the person(s) who are authorized to submit the bid with their signatures. **A certificate from bidder's HR/legal department must be enclosed with the bid, certifying that the person(s) who signed the bid is an authorized person on behalf of company.**

31. Un-signed, un-stamped and without certificate for authorized person from bidder's HR/legal department bid shall not be accepted.

Encl : As above.

BOQ for " Procurement of EMTP analysis Software at NLDC "

SL.No.	ITEM	Quantity	Unit Rate		Amount
			In Figure	In Words	
1	Professional License (Server/Cloud Based) Latest version	12			
2	Training at POSOCO, New Delhi, for 2 consecutive weeks each week with one session of 5 days for a group of 15 Engineer	01			
	Sub-Total				
3	Annual Maintenance for 5 years	60 months			
	VAT/Service Tax				
	Total				

Signature of Bidder:

Date & Seal:

Name of the Package: Procurement of EMTP analysis Software at NLDC

DEVIATION STATEMENT

Party's Name & Address:

To

 AGM(C&M)
NLDC, Power System Operation Corporation Limited,
B-9, Qutab Institutional Area, Katwaria Sarai, New

Delhi Dear Sir,

The following are the deviations and variations from the specification and documents for the subject package. These deviations and variations are exhaustive. Except these deviations, the entire work shall be performed as per your specification and documents.

Sl. No.	CLAUSE	As specified in the specification/ documents	Deviations & Variations to the specification / documents	Withdrawal Price in Rupees

Date:

Place:

Signature:

Printed Name:

Designation

Note: Continuation sheets of like size and format may be used as per party's requirement and annexed to this schedule.

TENDER ACCEPTANCE LETTER

(To be given on Company Letter Head)

Date:

To,

_____

_____

_____

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: _____

Name of Tender / Work:

_____

_____

Dear Sir,

1.   **I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely:**

_____

_____   **as   per   your advertisement, given in the above mentioned website(s).**

2.   **I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc.), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.**

3.   **The corrigendum(s) issued from time to time by your department/ organisation too has also been taken into consideration, while submitting this acceptance letter.**

4.   **I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.**

5.   **In case any provisions of this tender are found violated, then your department/ organisation shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.**

6.   Also I / We have not been suspended / blacklisted by any PSU / Government Department / Financial Institution / Court.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

Technical Specifications for the Electromagentic Transient Analysis Program.

The studies or modelling by the tool shall include, but is not limited to, the following.

a) Electro-magnetic and transient analysis type simulations.
b) Design and operation of HVDC (two/multilevel) links with detailed modelling of line-commutated and voltage-source converter type, both.
c) Ferroresonance in electrical networks.
d) Design and operation of protective relays in generation, transmission, distribution.
e) Operating behavior of underground cables with Cross Bonding with modelling of losses and surges under internal and external faults.
f) Series capacitors including spark gap & surge arrestor models, Lightning overvoltage, coordination of insulation, arrester specification and placement.
g) Detailed modeling of power cables and transmission lines based on travelling waves/distributed parameter theory.
h) Be able to simulate single and polyphase circuits in the same simulation.
i) Comprehensive modelling of controls systems. Availability of complicated arithmetic calculation blocks/models like Fast-Fourier and/or Wavelet Transform, Logic gates, mathematical functions, signals generators, comparators, network equivalence, transfer functions, file reader, and so on.
j) Inrush, Sub-synchronous resonance in networks with electrical machines and series compensated transmission lines and TRV studies.
k) Effects of pulsation of diesel engines on electrical grids.
l) Impact of rejection or addition of loads or power stations or transmission links on grid.
m) Overvoltage switching surges.
n) Energization of power equipment such as transformers, autotransformers, reactors, capacitor banks, motors and others.
o) Low frequency oscillations.
p) Design, integration and operational performance of renewables like the wind and photovoltaic Solar parks.
q) Facility to calculate transmission line parameter by entering the line configuration.
r) Harmonic Analysis
s) Study of FACTS, static var systems (SVCs, STATCOMs.etc..)
t) Protection Co-ordination study

Installation Requirements:

The software tool must be compatible and installable on a general purpose computer running Microsoft Windows 7 and above.

Software Interface Capabilities and Characteristics:

a) The software tool must provide an advanced easy-to-use Graphical User Interface (GUI) allowing the user to design, modify and simulate electric power and control systems networks.
b) The GUI must provide a drawing canvas with easy to access elements/model library. The user must be able to copy-paste elements from the library onto the canvas.
c) The GUI should facilitate building custom components.
d) For modelling large networks, a facility to divide networks in subnetworks must be available.
e) During the simulation, the user should be automatically alerted to error conditions or divergence and numerical incidence of all relevant process.
f) The software must have a feature to import the existing PSS/E network model to the EMTP analysis program and interface to Matlab software

g) The tool must be able to export the results of the simulation of transient files in text format separated by spaces or commas, as well as COMTRADE formats. In addition, the tool must provide the inbuilt functionality to store result in at least one of the following formats:
   a) Spreadsheets
   b) CSV
   c) Tabular
   d) Text File

h) The software tool must provide graphical results visualization

DATA AND PARAMETERS ENTRY FOR SIMULATION:

a) Data input mechanism should be user-friendly, graphical and interactive. The user should be facilitated with explanatory help text for each input/output and menu of components. The selection of options and other possibilities of program control must be interactive and user controllable.

b) The user should be able to construct / modify a circuit; start simulation and view results or solution. The user must be able to operate (read, graph) results in a single session, without closing the software in a single session, within the same environment, without closing the software or switching to a separate module.

c) Building networks should be graphical and using line oriented diagrams. For a better understanding of the case in simulation, the user must be able to include text boxes, guidance lines, geometric shapes or images, without limiting simulation capabilities of the program.

d) The user shall be able to run several cases or files at the same time (simultaneously) while using the available computer cores in parallel. In addition, the multiple cases running simultaneously should be able to exchange data. This feature is especially required for optimization problems.

e) Typical cable and transmission models and data must be available in the library. The tool shall be able to model coupling effects between overhead lines, between buried cables. Modelling capability of at least 12 conductor or 2 double circuits line must be possible.

f) The tool should allow simulation of control systems only. For example, the tool should allow for PSS control system tuning only without requiring to model a power system component on the canvas.

Effective computation techniques:

a) The tool must provide the functionality of multi-core or multi-server processing.

b) The tool must provide the functionality to apply limits on variables in the control components.

c) The tool must provide the functionality to build detailed models and frequency dependent equivalent electrical systems.

d) The tool must provide the functionality to modify in-line diagrams and the parameters of the elements of the power network. Provide measuring points facilities, parameters control, parameters protection, mechanical parameters, limits elements, variables interface to be graphed.

e) The tool must provide the functionality to interface, to develop and / or modify logic diagrams considering logic gates, comparators, inverters, timers, counters, arithmetic, trigonometric, matrix, differential, flow control statements (conditional and iterative); block diagrams for transfer functions and others.

f) The tool must provide the functionality to develop and / or modify routines / programs including user-defined routines running in software with the capability of doing automated parametric studies where one or more parameters in the system is changed automatically and their impact on the performance of the system is evaluated.

g) Must be able to import waveforms from other formats to incorporate them as sources of voltage, current or control variables in the simulations.
h) The tool must have an editor to create graphical objects and windows for data entry.
i) Ability to create and edit the user-defined graphic, at least the following characteristics: size of graphics, zoom in/out, change color of curves, add/delete text, orientation, axes, change background, line width, markers, figures, references, titles, data.
j) The library should include easily accessible models with typical data including models of electrical machines (induction and synchronous).
k) The program shall have the ability to simulate a 'large' electric network by breaking the system into smaller subsystems and utilizing multiple computer cores.
l) Capable of modelling large systems. The tools must have a feature offering the option for modeling frequency dependent elements (transmission lines).
m) Content sensitive on-line Help for each component must be able to facilitate the user to perform full-text search.
n) The tool must support automation through scripting.

Licensing options:

The vendors should clearly identify the type of licensing provided. Server/Cloud based licensing options could be provided. The license shall be with lifetime validity.

User Support:

The software vendor must be industry reputed with excellent technical expertise. Professional support services must be provided by the vendor via email, phone. International vendors must have a local support team or its representative to provide technical and commercial support. The vendor shall offer regular free of cost webinars,video tutorials etc. The vendor shall also have a usergroup for interaction among users in different utilities for peer learning.

Training:

The training shall consist of an essential mix of theory and practical hands-on. The vendor shall discuss relevant case-studies and the trainees shall be trained to simulate the cases and carry out the analysis using the visualization tool. The training material shall consist of presentation and the explanatory texts and shall be provided to the trainees in hard as well as soft copy.

Computer Requirements: Minimum computer requirements (including Hardware & Software) are required at RLDC/NLDC location to install the EMTP analysis software.