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**Technical Specification for Power system study Software Package for
carrying out of Electrical System Studies.**

Revisions:	Prepared by :	Checked by :	Approved by :	Date :
Refer to record of revisions	 A V SURESH	 P SURESH	 J K PATTANAIAK	27.04.2018



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1.0 SCOPE:

This specification covers the supply of power system studies software (ETAP or Equivalent) & Hardware, installation, onsite performance testing, Monitoring & Evaluation and acceptance testing of Power system studies Software including free maintenance, training at project site as indicated in enquiry specification.

2.0 TECHNICAL REQUIREMENTS:

- 2.1 The supplier shall be responsible for configuring the supplied software package and delivering the total solutions so that it meets the requirement of this specification. The supplier shall bring to the notice of OWNER with it's offer any incompatibility that may hinder proper operation or requirement of additional items / software if any to ensure completeness of the solutions offered.
- 2.2 Supplier should visit the site with prior arrangement and acquaint itself of the existing systems to ensure the suitability and compatibility of the new software package.
- 2.3 The supplier shall remain as the only contact agency for all the supplied products & Services.

3.0 SPECIFIC REQUIREMENTS OF SOFTWARE AND HARDWARE:

- 3.1 The Power System studies software (ETAP or Equivalent) shall be suitable for performing Electrical System Studies and Analysis for the electrical power distribution system of concerned project as indicated in bid enquiry. The software package shall have suitable modules for performing the analysis and studies that shall include but not be limited to the following, software shall have required number of buses subject to minimum 2000 bus level. The Software shall complies with all applicable international standards including ANSI, IEEE, IEC, UL, and British Standards etc.

Sl. No	Module description
1.	Equipment Evaluation Cable Ampacity & Sizing - IEEE, ICEA, NEC
2.	Short-Circuit Analysis- As per ANSI & IEC
3.	Arc Flash analysis- As per IEEE 1584 & NFPA70E (Requires SC)
4.	Load Flow & Voltage Drop analysis
5.	Motor Acceleration - Dynamic & Static start up analysis
6.	Load Analyzer
7.	Cable Ampacity & Sizing - IEC
8.	Harmonics analysis
9.	Star - Protective Device Coordination & Sequence of Operation
10.	Star Auto - Evaluation (Requires Star)
11.	Underground Thermal Analysis - Duct Banks & Cable raceway
12.	Transformer Sizing & Tap Optimization
13.	Transient Stability
14.	Generator Start-Up (Requires TS & UDM))



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15.	User-Defined Dynamic Models
16.	Motor Parameter Estimation Tuning
17.	Dynamic Parameter Estimation & Tuning (Requires UDM)
18.	Reliability Assessment
19.	Unbalanced Load Flow analysis
20.	Switching Sequence Management
21.	Import Access, Import & Export Excel
22.	Project Merge

Note: The software package shall be suitable for performing electrical system studies, analysis and major equipment sizing for an electrical system considering the following major equipment:

- In-plant Generators (GTGs ,STGs & Diesel Generators)
- Generator, Power & Distribution Transformers
- HV, MV and LV Switchboards
- Fault Limiting Reactors
- HV and MV Cables
- HV and MV Drives including Synchronous motors, Squirrel cage and slip ring induction Motors
- VFD fed Induction Motors
- HV and MV Capacitor banks
- Neutral Grounding Resistors and Transformers
- Power electronic equipment such as UPS systems, battery chargers, variable frequency drives, rectifiers etc.
- DC systems and battery banks (Lead acid/Nickel Cadmium)
- Relay and protection systems
- Motor starters such as DOL, Star-Delta, Autotransformer, Soft starter etc.

3.2 The software package shall meet the following requirements:

3.2.1 The offered software package shall be a LAN version package for simultaneous use by two users. The offered software version shall be the latest as on date of supply.

3.2.2 Hardwares like Laptops and associated accessories etc. shall be supplied along with the Software as a Package as mentioned in cl.no :8.0 of this specification

3.2.3 Complete software and hardware shall be supplied and installed at site as per specifications

3.2.4 Supplier shall include all required hardware and software requirements for LAN server, LAN nodes for the smooth operation of the software package. Any additional software required for operating the package other than the operating systems on machines shall be included in bidder's offer itself.

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- 3.2.5 All software material shall be supplied through adequate number of CDs. Supplier shall supply the software package in original packing through CDs and install the software package on the designated hardware and computing environment within one week of supply.
- 3.2.6 Two (2) sets of User and Operation Manuals (Each set of manuals shall be printed and no Photocopies shall be supplied).
- 3.2.7 Software and hardware supplied by the supplier shall be subject to acceptance by the owner after successful installation/demonstration at site.
- 3.2.8 The software package will be under guarantee for one year from the date of acceptance at site during which all upgrades of the package shall be supplied free of cost. Any bugs encountered during usage shall be rectified by the supplier. Original media shall be replaced if damaged during usage.
- 3.2.9 Support and maintenance for the package, including on-site support shall be provided as and when required during the guarantee period by the supplier without any additional charges to owner.
- 3.2.10 Supplier to indemnify, protect and save owner against all claims, losses, costs, damages, expenses, actions, suits and other proceedings resulting from infringement of any patents, trademarks, copyright in respect of the above software package.
- 3.2.11 The software supplier shall define if any hardware lock forms part of the Software. Any such device will be replaced, free of cost, if the same fails to operate during software usage/damaged.
- 3.2.12 The software supplier to confirm if ISO accreditation has been awarded to them.
- 3.2.13 The software supplier shall provide necessary documents/assistance to register owner as the registered users of the software.
- 3.2.14 Supplier shall provide on-site training to a batch of 15 owner's engineers (for a minimum period of 5 days) including intensive training on the Power System studies software (all modules) utilization, routine maintenance/ administration of the software, including the supply of all training material. Bidder to quote for above mentioned training.
- 3.2.15 Supplier shall offer the software version suitable for installation on owner's LAN (Intranet). Supplier shall customize the software with respect to the output reports/forms/graphics, which shall be generated on standard formats for A4 (portrait and landscape), A3 and larger sizes as required.
- 3.2.16 The complete installation of the software package on owner's server and machines is included in supplier's scope. Owner shall accept the software package after complete onsite performance testing, monitoring and evaluation for a minimum 10 days after installation, if necessary, is completed to customer's satisfaction.

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- 3.2.17 Supplier shall support the software package with regular upgrades and patches as soon as the software developer releases these, during warranty period or within one year from date of installation at site shall be provided to owner free of charge.
- 3.2.18 Other than the use of customer's server and supplier supplied machines, no other facility shall be provided by the owner for the training. Supplier shall provide all training material and equipment required for the training.
- 3.2.19 After completion of a system study / analysis, all input and output, data is required to be archived such that the same is available for future studies after suitable revision. Supplier to highlight the features available in software package for backing up/archiving project databases for this purpose.
- 3.2.20 All available standard equipment/component libraries shall be included with the software package.

4.0 GENERAL REQUIREMENTS OF SOFTWARE AND HARDWARE:

- 4.1 The software (ETAP or Equivalent) shall be supplied for handling minimum of 2000 buses for a given project.
- 4.2 The above shall be capable of carrying out the required calculations, analysis and results in line with applicable international standards like IEC/IEEE.
- 4.3 Wherever required, custom-built data libraries shall be provided, as part of the software. The supplier shall furnish the details list of these libraries along with the offer to owner.
- 4.4 Any pre-requisite software required for satisfactory working of Software is to be indicated and quoted in the offer. On technical evaluation for its essentiality, such software would be made available by owner. However, ordering on the supplier for the same would be at the discretion of OWNER.
- 4.5 The supplier shall quote for 2 years of AMC of the software (after warranty period), subsequently extendable with mutual agreement. The AMC shall cover the requirement as mentioned at Cl.7.0 of this specification.
- 4.6 The software shall be supplied with hardware lock.

5.0 CUSTOMIZATION OF SOFTWARE:

- 5.1 Customization efforts in respect of the above modules is included as part of the scope for generating detailed design calculations, Electrical Single Line Diagram, etc., (including customization of report formats as per OWNER documentation requirements). Customization carried out against the requirements stipulated in this specification shall be the property of OWNER.

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5.2 Whenever the user has once entered data in software for system design for calculations/analysis, the same shall not be required to be entered again for the purpose of the above reports unless otherwise intended specifically for revision/updating purposes. Further, any data related to equipment parameters/prescribed by applicable standards, which have been captured from the internal shall also be reported in the input tables.

5.3 Revised inputs & output data shall be clearly highlighted in the reports for easy identification of revision details in each revision when compared to the previous revision.

5.4 Data Libraries: Wherever the custom database provided along with the software requires to be augmented (e.g. data for indigenous makes of equipment, Indian standards, etc.) /the same shall be done free of cost by the supplier as mentioned in this specification during the warranty.

6.0 TRAINING:

6.1 Supplier shall provide on-site training to a batch of 15 owner's engineers (for minimum period of 5 days) including intensive training on the routine maintenance/ administration of the software, including the supply of all training material.

6.2 Supplier shall provide 15 temporary licenses for software for conducting for each batch of training.

6.3 10 sets of hard copies and 2 sets of soft copy (on CD-ROM) of course material should be provided before start of training at owner's premises.

6.4 Schedule of training shall be submitted along with offer for owner's approval.

7.0 WARRANTY & Annual Maintenance contract (AMC) PERIOD:

7.1 Supplier shall confirm that the software package supplied shall have warranty period of one year from the date of successful installation, performance testing, and evaluation and the Annual Maintenance Contract (AMC) will start only after completion of this warranty period

7.2 The supplier shall ensure that owner is registered with it's OEM and undertakes to honor the contract with respect to the supply of free upgrades / updates and all technical support.

7.3 Supplier shall certify that software updates / upgrades are latest (release by OEM) as on that date along with each invoice raised for payment during warranty/AMC Period.

7.4 Supplier to confirm that 98% uptime for software shall be guaranteed during warranty period.

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- 7.5 Free supply and installation of upgrades / updates shall be carried out as and when they are released by OEM for the relevant operating system and free up-gradation to latest level. All patches / service packs / updates / upgrades deliverables if any, should be delivered to Owner through CD.
- 7.6 Supplier shall confirm that for each upgrade / update, soft copy of user documentation shall be supplied on free of charge. Supplier should arrange for proper receipt and redressing of all complaints during the warranty period/AMC Period.
- 7.7 Supplier shall confirm that all the modules and the functions already provided in the software package supplied to owner are also made available during the supply of all future upgrades / updates during the warranty period, irrespective of any change in packaging policy for the software.
- 7.8 Supplier shall confirm that the software package media shall be warranted for its smooth and trouble free operation. In case the media gets corrupted or damaged, replacement shall be provided free of cost during the warranty period/AMC Period.
- 7.9 Technical support shall be provided regarding the software usage through email / fax / phone / letter correspondence and also by minimum of one visit of technical expert for every quarter during warranty period/AMC period. This should also cover support for installation of the software & for performing system administration tasks and for resolving other technical problems during the usage of the software.
- 7.10 While providing the updates / upgrades during warranty/AMC period minimum of two days training shall be provided at free of cost for each such supply of new upgrade / update. Supplier shall confirm accordingly.
- 7.11 Power System Studies software license shall be on name of M/s HPCL only. Contractor shall include maintenance of software, the maintenance shall cover free replacement of Power System Studies hardware key (if damaged), free upgradation of latest version as on date till 1-year or till end of warranty period post completion of onsite performance testing, monitoring & evaluation.

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8.0 SPECIFIC REQUIREMENTS OF HARDWARE:

Following hardwires shall be supplied along with the Software as a Package.

- 2 sets of HP laptops with IDS UMA i7-7500U 450 G4 Base NB PC, Core i7 G7 Label, 15.6 inch FHD(1920x1080) Anti Glare LED SVA for HD Webcam with 2 Antennas slim, 16GB (2x8GB) DDR4 2133 1TB 5400RPM SATA Intel 7265 ac 2x2 nvP +Bluetooth 4.2 LE, DVD+/- RW SM DL Win10 PRO 64 OS DVD INDIA, MS office Home & Business 2016FPP and mouse.

Note:

- (i) Bidders shall enclose configuration data sheets with make/model no for Laptop/Printers along with techno-commercial offer, for owner to choose the same during bidding stage itself.
- (ii) The above configuration of Laptop/Printer is specified as minimum requirement, however bidder shall supply latest configuration of Laptop as available at the time of inspection/dispatch irrespective of the configuration mentioned in bidder's techno-commercial offer.
- (iii) Laptop shall be supplied along with carrying case.

9.0 BHEL MATERIAL CODIFICATION:

VARIANT NO.	DESCRIPTION	MATERIAL CODE
1.	ESS Software Package for simultaneous use by two users of LAN Version including hardware & 1 Yr warranty	PY9855288017
2.	On-site training for 15 owner's engineers for a minimum period of 5 days	PY9855288025
3.	2 nd Year AMC for maintenance of software complying with Cl.7.0 of this specification.	PY9855288033
4.	3 rd Year AMC for maintenance of software complying with Cl.7.0 of this specification.	PY9855288041

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Vendor shall be quote unit prices and total prices in the format indicated in Price schedule furnished along with NIT documents. The evaluation shall be done on the basis of overall package price.

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10.2 Deviation Schedule (Technical)

Enquiry No. Date :

Name of the Bidder :

Project :

Specification No : PY55288, REV-00

Item : Power System studies software

1. Deviation to tender documents, if any, shall be consolidated list of deviations shall be submit in this schedule.
2. Deviation listed elsewhere will be summarily rejected and shall be ignored.
3. Attach more sheets in this format, if required.
4. If there are no deviations the same shall be mentioned in the format and submitted.
5. Bidder shall state reason for the deviations in the remark column.
6. Only the deviations listed herein, in conjunction with the original tender, shall constitute the contract document for the award of the job to the Bidder.

Sl.No.	Cl.No./Page No./Sec No.	Description as specified	Deviation taken	Reason	Remarks

(Signature of the Bidder with Seal)

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10.3 Check list for bidder

Enquiry No. Date :

Name of the Bidder :

Project :

Specification No : PY55288, Rev-00

Item : Power System studies software

S.No	Check point description	Bidder Compliance
1.0	Deviation schedule enclosed (Format- 10.2)	Yes/No
2.0	Filled in Technical data sheets enclosed	Yes/No
3.0	Signed & Stamped unpriced price format enclosed (Format- 10.1)	Yes/No

Bidder shall strictly fill up the check list as applicable and submit along with technical offer. Otherwise offer shall not consider for evaluation.

(Signature of the Bidder with Seal)

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