NATIONAL INSTITUTE OF TECHNOLOGY SILCHAR

Silchar – 788 010 (ASSAM)

No: NITS-PS-548-EE-Power System Analysis-18

Date: 06/03/2018

Tender Fee - Rs.500/-

EMD @2% of the total bid value

NOTICE INVITING TENDER

FOR SUPPLY AND INSTALLATION POWER SYSTEM ANALYSIS SOFTWARE FOR EE DEPARTMENT AT NIT SILCHAR

LAST DATE & TIME OF SUBMISSION	:	27/03/2018 up-to 01.00PM
DATE & TIME OF OPENING	:	27/03/2018 at 03.30PM

NATIONAL INSTITUTE OF TECHNOLOGY
SILCHAR - 788 010
Tel.No. Director: (03842) 224879 Fax: (03842) 224797

NOTICE INVITING TENDER

Adv. No: NITS/PS-548/EE/Power System Analysis/18

Sealed Tender/Quotations are invited from reputed Firms/Agencies/Manufacturer/Authorized Dealer **FOR SUPPLY AND INSTALLATION OF POWER SYSTEM ANALYSIS SOFTWARE FOR EE DEPARTMENT AT NIT SILCHAR**

Detail specification of the item/items is given in **(Annexure – A).**

Tender documents can be obtained from Purchase Section, NIT Silchar or may be downloaded from Institute website www.nits.ac.in or http://tenders.gov.in. **The cost of tender document is Rs.500/-** (Non-refundable) to be submitted in the form of Demand Draft in favour of The Director, NIT Silchar, and Payable at Silchar. The last date and time for submission of Tender documents will be 27/03/**2018** up-to **01.00PM** and tender will be opened on the same date at **03.30 PM** in office of HOD, EE Department, NIT SILCHAR.

The offers without Cost of Tender shall be out rightly rejected.

Director, NIT Silchar reserves the right to extend the date, or cancel the tender, accept or reject any/all quotations or not to purchase all or any of the items.

Quotations are to be sent/submitted in sealed covers addressed to:-

The Faculty-In-Charge, Purchase
National Institute of Technology, Silchar-788 010 (Assam)
Email : purchasecell.nits@gmail.com

REGISTRAR, NIT SILCHAR

NOTICE INVITING TENDER

Credential Criteria:

- The bidder should have provided similar nature of services to IITs/NITs/Govt. Departments/Semi Govt. Departments/PSU/Educational Institutions of National Importance etc. during last 3(three) years. **Duly certified copies are to be enclosed.**
- Quotations are to be submitted in properly sealed covers; the address of the firm submitting the quotation must appear on the sealed cover and the cover shall be super scribed as

  - "QUOTATION FOR SUPPLY & INSTALLATION OF .....FOR ..... NIT SILCHAR.
  - VIDE TENDER REF NO NITS/PS-....., DATED.....DATE OF OPENING .....

[The bid will summarily be rejected & returned to the bidder if the sealed envelope containing the quotation is not super scribed as above].

- **Genuine Pricing** (Both foreign & indigenous) :Vendor is to ensure that quoted price is not more than the price offered to any other customer in India to whom this particular item has been sold recently, particularly to IIT/Institutes and other Government Organization.
- **No Part Delivery:** Part shipment for any items will not be allowed.
- **Any Optional item quoted by the supplier will not be entertained.**
- **Termination for default:** Default is said to have occurred -
- If the supplier fails to deliver any or all of the items/services within the time period(s) specified in the purchase order or any extension thereof granted by NIT Silchar, the Institute may terminate the contract / purchase order in whole or in part and forfeit the EMD/PBG as applicable.

TERMS & CONDITIONS:

1. The bidding agency should be reputed firm and having all necessary certificates, viz. GST registration certificate, PAN, Registration, Sale Tax clearance Certificate, Authorized Dealership/Distributorship certificate, etc. The photocopies of all the certificates should be attached with the tender.
2. The firm should be an original software developer/manufacturer (OEM) in the business of manufacture or supply of software for minimum 5 (five) years. The firm should submit audited financial statements for latest three financial years in support of this claim.
3. The items being quoted should be of Original Manufacturer and no non-standard item should be quoted. All detailed specifications with make & model no. of the items accompanied by proper leaflets should be clearly mentioned and attached with the offer. In case of proprietary or patented item, necessary certificates in support of the same should be attached. The bidder must submit the Compliance Statement and Deviation Statement of technical specification.
4. The firm should have satisfactorily manufactured and supplied equipment, as requisitioned in this tender, to IITs/NITs/Govt. Departments/Semi Govt. Departments/PSU/Educational Institutions of National Importance etc. during the last three years ending the last day of March 2017.
5. **The rate quoted must be both in words and figures and F.O.R. / Destination National Institute of Technology, Silchar inclusive of packing, forwarding etc. Octroi, surcharge, insurance, Installation and any other charges.** Educational discount, if any should be indicated clearly. Tenderer(s) may note that the Government of India exempts this Institute from paying custom duty/excise duty on selected items. Necessary documents will be furnished if required on demand by the Tenderer(s). **Rate quoted for any other destination shall not be accepted.**

6. **Quoted rate should be for total package for item 1 to 9. No part rate for different module will be accepted.**

7. Assam Sales Tax must be quoted as extra in the tender, wherever applicable.

8. NIT Silchar will not provide educational concession Central Sales Tax Form'D', wherever applicable.

9. Payment: Payment shall be made only after receipt and installation of the materials/articles in good and working conditions as per specifications and after satisfactory installation and commissioning of the equipment/machinery/accessories by the department.

10. Manufacturer's/Company's name, it's trademark should be mentioned in the Tender and illustrative leaflets giving technical particulars, etc. should be attached in the tender.

11. Tenderer(s) registered with the State/Central Government must quote his registration numbers, if any, and submit a Xerox copy of registration along with the tender.

12. Guarantee/Warranty period offered for the tendered item is to be clearly specified.

13. The rates to be quoted by the agency should be valid for a period of 6(six) months after the deadline date specified in the tender.

14. The quantity against each item mentioned in the tender may vary according to the actual requirements at the time of placing Purchase Order.

15. **Each bidder should clearly specify that the bidder agrees to abide by the conditions of this tender document on their printed letter head duly sealed & signed by an authorized person.**

16. **Bid Price**

    a) The contract shall be for the full quantity as described above. Corrections, if, shall be made by crossing out, initialing dating and rewriting.

    b) **The bidder should quote the total price for the tendered package inclusive of packing and forwarding, all duties, levies, insurance, installation, any other charges, etc. Only taxes & (discount if any) should be mentioned separately**.

    c) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

17. Each bidder shall submit only one quotation.

18. All necessary documents shall be furnished along with the bid.

19. Validity of Tenders/Quotations: Tenders/Quotations shall remain valid for a period not less than 6 (six) months after the deadline date specified for submission of tender.

20. **Packing**

a) The Supplier shall provide such packing of the Goods as 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 have to be taken into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

b) The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be provided for in the Contract including additional requirements.

21. **Evaluation of Quotations :**

NIT Silchar will evaluate and compare the quotations determined to be substantially responsive i.e. which

a) are properly signed

b) Conform to the terms and conditions, and specifications.

22. **Award of contract:**

NIT Silchar will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

a) The bidder whose bid is accepted will be notified of the award of contract by the NIT Silchar prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

b) Normal commercial warranty/guarantee shall be applicable to the supplied goods.

c) The goods (both indigenous & imported) should be insured against theft, loss or breakage during transit till destination.

d) Upon delivery of goods, the supplier shall submit Suppliers Invoice, Insurance certificate, Warranty Certificate, or any other document.

23. **Acknowledgement of the Purchase Order**: The supplier shall give an acknowledgement of the Purchase Order within 15 days of the date of the Purchase Order. In case, the supplier fails to acknowledge the Purchase Order within the stipulated time, the Institute is at liberty to cancel the Purchase Order.

24. No alternations in tender forms shall be made by the bidder and if any such alteration is made, the tender is liable to be rejected.

a) Delivery Schedule and Penalty for Delay: Delivery of equipment should be made within 30days /as per Purchase Order from the date of issue of Purchase Order. **Penalty at the rate of 0.5% or part thereof of the order value per week, subject to a maximum of 2.5% will be imposed for delayed delivery and installation.**

25. Demurrages and penalty, if any, paid by the supplier shall not be borne by the Institute.
26. The tenders submitted shall clearly mention the name of the firm/person in whose favour the purchase order is to be placed.
27. Contact details of the person for all post sales/installation maintenance support should clearly be given with **Name & Designation, Phone No, Fax No, Mobile, E-mail and official address.**
28. National Institute of Technology Silchar is not liable for non-receipt of the tender forms in time due to wrong address/ any delivery delay of the mail service provider/ force majeure. Tender documents received after the last date and time for receiving tenders will be summarily rejected.
29. **Successful bidder shall give a performance security @10% of the total order value in the form of Bank Guarantee.** The performance security shall be furnished after the order for supply is placed and before the final payment. Validity of the Performance Security shall cover the warranty period.
    - The proceeds of the Performance Security shall be payable to the purchaser as compensation for any loss resulting from the suppliers failure to complete its obligations under the contract.
30. Payment will be released after proper installation of the supplied software in its full working state with free demonstration & training to the users at the Institute (NIT Silchar) for 2 days as per the convenience of both manufacturer or/ and supplier and NIT Silchar on mutually agreeable dates.
31. QA standards and verification & validation for revision life cycle are to be ensured with proper document.
32. All legal disputes shall be under the jurisdiction of the Silchar Courts of Cachar District in the state of Assam.

Registrar, NIT Silchar

DECLARATION

I / We hereby declare that no case is pending with the police/ court against the proprietor/ firm/ partner or the company (Agency). Also I /We have not been suspended / blacklisted by any PSU / Government Department / Financial Institution / Court.

(Signature & seal of the contractor)

Place:

Date:

NO DEVIATION CERTIFICATE

Notwithstanding anything mentioned in our bid, we hereby accept all the terms and conditions of this tender and we do not have any deviation to this tender enquiry. We hereby undertake and confirm that we have understood the scope of work properly and shall be carried out as mentioned in this tender enquiry.

(Signature & seal of the contractor)

Place:

Date:

BIDDERS DETAILS

Name of the Contractor /Party/ Firm	:	
Name of Authorized Representative	:	
Phone Nos.	:	
Mobile Nos.	:	
Fax No.	:	
E-Mail Address	:	
Web Site Address (If Any)	:	

(Signature & seal of the contractor)

Place:

Date:

TECHNO-COMMERCIAL BID

NAME OF THE WORK: Supply and Installation of ..... at NIT Silchar
TENDER NO.:NITS/PS-....., Dtd. ....., LOS : .....

Sl. No.	Name of item with Specification, Make & Model	QTY./USER	Rate for Total Package	Taxes in %	Total Amount in
				Sub Total Amount	
				Discount (if any)	
				Taxes (if any)	
				Other Charges (if any)	
				Grand Total Amount	
(AMOUNT IN WORDS)					

I/ we have gone through all the Special & General Conditions and the contractor's obligations enclosed with this tender document and agree to abide by these.

Note: **In case of discrepancy in rates between figure & words the higher will be taken for evaluation of bid and lower value will be taken for award of work.**

(Signature & seal of the contractor)

Place:

Date:

CHECK-LIST (TECHNICAL BID)

SUMMARY OF COMPLIANCE TO REQUIREMENT OF TENDER

Sl. No.	Description of Requirement	Yes / No / NA	Page No.
1.	Tender Cost Rs.500/- (Non-refundable) in the form of Demand Draft in favour of "Director, NIT Silchar" in a separate envelope		
2.	EMD @2% of total bid value in the form of Demand Draft /Bank Guarantee in favour of "Director, NIT Silchar" in a separate envelope		
3.	Copy of Manufacturer/ Authorized Supplier Certificate		
4.	Audited financial statement for the last 3 years		
5.	Copy of the PAN card.		
6.	Copy of VAT registration certificate		
7.	Copies of previous work order of similar work with completion certificate (if any)		
8.	Declaration certificate		
9.	No Deviation certificate		
10.	Bidder's details		
11.	Technical Specification		
12.	NSIC/SSI Certificate where applicable		
13.	All the pages of tender document have been signed		
14.	Price bidin separate sealed envelope.		
15.	Complete copy of Techno Commercial Bid submits along with the Price Bid.		

(Signature & seal of the contractor)

Place:

Date:

Annexure-A

TECHNICAL SPECIFICATION FOR POWER SYSTEM ANALYSIS SOFTWARE, Required Qty. 01(10USER)

CONTENTS

(1) BASE MODULE

KEY FEATURES

- Built-in intelligent graphics
- Network nesting
- Integrated 1-Phase, 3-Phase, & DC systems
- Integrated AC, DC, & grounding systems
- Multiple generators & grid connections
- Display results on one-line diagrams
- Graphical undo / redo
- Relay & current transformer mirroring
- Current transformer polarity
- User-defined symbol text
- Voltage propagation
- Graphical alignment tools
- Group rotation of elements
- Customizable font types, styles, & colors
- Customizable display of ratings & results
- Graphical display of equipment impedance & grounding
- Graphical display of overstressed devices & alerts
- Hide & show protective devices & grounding systems
- Propagation of nominal & rated voltage
- Propagation of phase connection
- Automatic display of energized & de-energized elements
- using dynamic continuity check
- Text box editor with dynamic link to properties
- OLE object & ActiveX control integration
- Intelligent text box & hyperlink bookmarks
- Customizable output reports via Crystal Reports®
- Batch printing with view-dependent printer settings
- User-friendly plotting
- Alt + Click & let SOFTWARE Auto-Select do the work for you
- Create & utilize unlimited one-line templates
- A large array of keyboard shortcuts which saves time & effort in creating & editing
- Symbol library to substitute default one-line diagram symbols with an alternative symbol set for individual device types
- Base Package 3-D Database
- Base Package - Cable Ampacity Calculation Software
- Base Package - Cable Sizing Software
- Base Package - Line Constants
- Study Managers
- Project Wizards
- Libraries
- System Elements
- One Line Diagram
- Output Report Data Comparator
- Network Simulation
- Built-In Calculators
- Data Exchange – DataX
- **Multi-Dimension Database** (Lock & unlock element Properties, 16 States to track equipment conditions, Connectivity to Local SQL server)

- **Data Manager** (View Base & Revisions Data differences, View equipment property differences, Display& filter study data, Graphical management of data)
- **Project Merge** (Multi-user management of project merge, Parallel ETAP project development, Self contained snapshots of the parent & branch projects)
- **Theme Manager** (Display color coding based on: User-defined, Voltage Level, Area, Grounding(Solid,Low-Z), High-Z, Un-Grounded), Earthing (TT,T N, IT, NEC, earthing elements), Color coding based on grounding/earthing, Display faulted buses by symbol or color)
- **Multiple Language Support** (Full language editions: English, Spanish, Chinese, Japanese, Russian, Localized output reports: English, Spanish, Chinese, Japanese, Russian, Portuguese, German)

(2) LOAD FLOW ANALYSIS KEY FEATURES

- Voltage drop study & analysis
- Power factor correction
- Automatic device evaluation
- Automatic temperature correction
- Two-winding & three-winding transformer LTC actions
- Automatic voltage regulator actions
- Real & reactive power losses
- Extensive violation alerts
- Multi-report power flow result analyzer
- Auto-Run Load Flow based on system changes
- New toolbar to change & display result units
- Report Voltage in %, kV V
- Report Power in MVA, kVA
- Modeling isolated 1-phase source & system

LOAD FLOW ANALYSIS FLEXIBLE OPERATIONS

- Diverse operating conditions
- Multiple loading & generation categories
- Multiple demand factors
- Unlimited configurations
- Different nameplate data
- Global & individual bus diversity factors

(3) LOAD ANALYZER SOFTWARE

The Load Analyzer module is designed as a generalized load list to report load schedules for power system components such as switchgear, MCC, transformers, cables, lines, panels, etc. Different reports provide informative data regarding all loads connected downstream to equipment.

Load Analyzer is an invaluable tool during the design / planning phase as well as analyzing existing electrical systems because running system studies like load flow analysis may not be possible due to incomplete one-line diagram or data.

LOAD ANALYZER REPORTS

- ☑ Bus Loading
- ☐ Bus Summary
- ☐ Cable List
- ☐ Load List
- ☐ MCC Tabulation
- ☐ Tabular One-Line
- ☐ System Load
- ☐ Transformer List
- ☐ *and more*

REPORTS INCLUDE THE FOLLOWING USER OPTIONS:

- ☑ Base or Revision Data
- ☐ Configuration
- ☐ Loading Category
- ☐ Connected / Operating Loads
- ☐ Continuous / Intermittent / Spare Loads
- ☐ Continuous / Non-Continuous Loads
- ☐ Demand Factors
- ☐ Diversity (Deviation) Factors

(4) SHORT CIRCUIT KEY FEATURES

- ☑ ANSI / IEEE standards C37 & UL 489
- ☐ IEC standards 60909 & 61363
- ☐ Automatic device evaluation for 3-phase, 1-phase, & panel systems
- ☐ Load terminal short circuit calculation
- ☐ Display critical & marginal alerts
- ☐ Integrates with protective device coordination
- ☐ Seamless transition to Arc Flash Analysis

CAPABILITIES

- ☑ Automatic 3-phase device evaluation
- ☐ Device evaluation based on total or maximum through fault current
- ☐ Automatically adjust conductor resistance & length (both lines & cables)
- ☐ Global or individual device impedance tolerance adjustments for maximum & minimum fault currents
- ☐ Include / exclude fault impedance modeling for unbalanced faults
- ☐ Include / exclude shunt admittance for branches & capacitive loads (unbalanced faults)
- ☐ Graphical or tabular bus fault selections
- ☐ Automatically determine fault currents at motor terminals without the need to add additional buses
- ☐ Phase-shifting transformers
- ☐ Grounding models for generators, transformers, motors, & other loads
- ☐ Motor contribution based on loading category, demand factor, or both
- ☐ Extract manufacturer published data from the libraries for thousands of devices
- ☐ Automatically determine fault currents at motor terminals without the need to add additional buses

(5) CABLE SYSTEMS SOFTWARE

Software's Cable Systems should help engineers design cable systems to operate to their maximum potential while providing secure and reliable operation. The process is systematic and simple. Software should contain Cable Thermal Analysis Software, Cable Pulling Software, and automatic Cable Ampacity Software, and Cable Sizing Software calculations for a complete and wide solution for your cable system needs.

- Automatic cable sizing based on various industry standards
- Steady-state and transient temperature calculations
- Cable ampacity optimization based on loading demands
- Calculate pulling tensions at various locations
- Cable Library with neutral g rounding/protective conductor(PE)
- Add auxiliary neutral & PE conductors to cables
- Damage curve for neutral & PE conductors
- Cable Ampacity & Sizing - IEEE/NEC
- IEEE 399, NEC70E, ICEA P54
- Cable sizing based on maximum or average phase operating current
- Ampacity & sizing reports in Crystal Reports& Excel
- Grounding conductor selection based on NEC
- Cable ampacity & sizing for U/G installation based on NEC
- Cable ampacity & Sizing - IEG/BS
- BS 7671, IEC 60364
- Model Forms: BS & user-definable
- Cable sizing based on harmonic effect
- Typical overcurrent device curves
- Cable sizing based on maximum or average phase operating current
- Ampacity & sizing reports in Crystal Reports & Excel

(6) RELAY COORDINATION KEY FEATURES

- Overcurrent protective device coordination & selectivity
- Equipment damage curve plotting
- Sequence-of-operation fault analysis
- Verified & validated protective device library
- Relay test set interface
- Automated Device Protection & Coordination - AutoStar
- Intelligent rule-based evaluation
- Protection & coordination alert view
- Interactive result analyzer
- Automatic detection of protection zones
- Automatic selection of coordination paths
- Protection & coordination zone viewer
- Protection & Coordination
- Rule-Book - AutoStar
- Embedded algorithm for applying best practices for protective device coordination
- Rule-based verification against Standards
- User-definable rules for protection & coordination selectivity

CAPABILITIES

- AC & DC overcurrent device coordination analysis
- ANSI & IEC coordination & protection standards

- Relay & Breaker device coordination analysis
- Phase & ground overcurrent coordination evaluation modes
- Graphically adjustable device settings
- Comprehensive verified and validated protective device libraries
- One-line diagram integration
- Intelligent alert view for troubleshooting
- Detailed device setting reports
- Embedded short circuit analysis
- Virtual animation of sequence-of-operation playback
- Embedded motor acceleration analysis
- Modeling of multi-function & multi-level relays
- Normalized plots shifted based on fault contributions
- Flexible user-definable display & plot options
- Extensive damage curve modeling & plotting
- Professional time-current characteristic plots
- Built-in interface with relay test set

SEQUENCE OF OPERATION
KEY FEATURES
- User-definable fault insertion location
- View device operation sequence graphically
- Device failure & backup operation
- Detailed relay actions (27, 49, 50, 51, 51V, 59, 67, 79, 87)
- Sequence of event viewer
- Normalized (shifted) TCC curves
- Phase & Ground faults (symmetrical & asymmetrical)
- Flashing protective device via the one-line diagram

DRAG & DROP A FAULT
- Phase & ground faults
- Display fault currents on the one-line diagram
- Illustrate system wide coordination
- Tabulate operating times via an event viewer
- Customizable report

(7) TRANSIENT STABILITY ANALYSIS PROGRAM KEY FEATURES

- Complete synchronous & induction machine models
- Comprehensive excitation system models
- Comprehensive turbine/engine-governor models
- Standard Power System Stabilizer (PSS) models
- Compatibility with User-Defined Dynamic Models (UDM) Program
- Unlimited sequence of events & actions
- Simulate typical & common disturbances & operations
    - bus balanced and unbalanced fault
    - branch segment fault
    - protective device open and close
    - generator start-up
    - generator input power adjustment

- generator voltage set point adjustment
- generator isoch./droop mode changes
- generator filed winding fault
- power grid voltage drop/raise
- motor acceleration/reacceleration
- motor load adjustment
- and many others

- Automatic relay actions based on relay settings & system responses
- Short-time & long-time transient simulations
- Variable total simulation time & simulation step
- Tie CB closing with auto synch-check action
- Embedded Newton-Raphson and accelerated Gauss Siedel initial load flow methods
- Faster calculation time by skipping tabular plots
- Frequency dependent network modeling
- Frequency dependent modeling for synchronous machines (sub-transient models) and induction machines
- Transformer inrush modeling
- WTG user-defined dynamic modeling
- Lumped Load user-defined
- Dynamic modelling
- New built-in IEEE standard exciters - AC2A,AC7BD, C4B,S T1A,S T2A
- VFD dynamic modelling: - Rectifier DC link & inverter models, Voltage& frequency control models, Frequency control acceleration & operation
- UPS parallel operation modelling
- PV Array source modelling
- Inverter source modelling

(8) HARMONIC LOAD FLOW ANALYSIS KEY FEATURES

- Comply IEEE 519 Standard
- Harmonic voltage and current distortion evaluation (THD & IHD)
- Harmonic telephone influence factors (TIF & I*T)
- Automatic alerts of harmonic violations
- Typical and user definable harmonic sources library
- Embedded Newton-Raphson and Gauss-Seidel load flow methods
- Harmonic current injection method
- VFD harmonic modelling
- Calculate & report I *TB(Balanced) & I*TR (Residual)
- UPSA C input & output modeling for harmonic orders
- PV Array modeling for harmonic orders

COMPLIED HARMONIC STANDARDS

- IEEE 519
- ANSI/IEEE 399
- IEEE 141

HARMONIC LOAD FLOW ANALYSIS CAPABILITIES

- User-expandable harmonic source library
- Modelling voltage & current harmonic sources

- Considering both harmonic source magnitudes & phase angles
- Harmonic source based spectrum or device parameters
- Model up to the seventy-third (73rd) harmonic
- Temperature-dependent line & cable resistances
- Automatic adjustment of equipment impedance to harmonic frequency
- Includes phase shifting transformers
- Build-in single-tuned, high-pass, & band-pass harmonic filter models
- Create harmonic filters to shift resonance points to less harmful frequencies
- Identify harmonic distortion problems
- Identify & analyze telephone interference problems by harmonics
- Identify parallel resonance conditions
- Fundamental load flow results
- IEEE 519 defined harmonic indices
- Total & harmonic voltage & current
- Harmonic Distortions (THD & IHD)
- Root Mean Square Values (RMS)
- Voltage Arithmetic Summation (ASUM)
- Telephone Interference Factor (TIF)
- I*T product
- Time-domain waveform plots
- Frequency-domain harmonic spectrum plots
- Harmonic filter performance evaluation
- Report voltage & current harmonic distortions
- Report RMS, ASUM, TIF, & I*T values
- Text output reports including harmonic violation flags
- Graphical one-line display of harmonic results
- Voltage & current harmonic spectrum plots
- Export one-line diagrams to third party CAD systems
- Fundamental load flow results
- Use Crystal Reports® for full color, customizable reports
- Export output reports to your favorite word processor

HARMONIC FILTER & SIZING KEY FEATURES

- Harmonic filter design & sizing
- Building in single-tuned, high-pass, & band-pass harmonic filters
- Harmonic filter sizing based on power factor correction, minimum cost, or minimum operation objectives
- Automatic harmonic filter overloading checking & alert

(9) OPTIMUM POWER FLOW KEY FEATURES

- Solve multiple objectives simultaneously
- Use interior point method with barrier functions
- Minimize active and reactive power losses
- Active power optimization
- Reactive power optimization
- Optimal generation dispatch
- Real power generation controls
- Reactive power generation or generator voltage controls

□ Capacitor bank or SVC controls

OPTIMAL POWER FLOW CAPABILITIES
☑ Component & operating constraints
□ Transmission line interface limit constraints
□ Bus voltage constraint with weighting factors
□ Branch flow constraint with weighting factors
□ Control limit constraints
□ Diverse operating conditions
□ Multiple loading categories
□ Global & individual bus diversity factors
□ Multiple demand factors
□ Unlimited configurations
□ Different nameplate data
□ Produce results with incredible speed
□ User-controlled infeasibility handling

QA STANDARDS

The Software Quality Assurance Program is specifically dedicated to meeting the requirements of the following standards:

ISO 9001:2008
Model for Quality Assurance in Design, Development, Production, Installation and Servicing - ISO 9001:2008 Registered Certification Number 10002889 QM08

United States Code of Federal Regulation, Title 10 CFR Part 50
Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants

United States Code of Federal Regulation, Title 10 CFR Part 21
Reporting of Defects and Noncompliance

United States Code of Federal Regulation, Title 10 CFR Part 50.55
Condition of Construction Permits, Early Site Permits, Combined Licenses, and Manufacturing Licenses

ANSI / ASME N45.2 - 1977
Quality Assurance Program Requirements for Nuclear Facilities

ASME NQA-1 (includes Subpart 2.7)
Quality Assurance Requirements for Nuclear Facility Applications

ISO 9001:2008
Quality Management Systems – Requirements

ANSI / IEEE 730.1 - 1989
IEEE Standard for Software Quality Assurance Plans

CAN / CSA-Q 396.1.2 - 1989
Quality Assurance Program for Previously Developed Software Used in Critical Applications

ANSI N45.22 - 1972
Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants

VERIFICATION & VALIDATION PROCESS - REVISION LIFE CYCLE

Software product should comply with U.S. Code of Federal Regulations as well as other quality assurance standards.

The Software Quality Assurance Program should strictly enforces policies and specific procedures that ensure the reliability of all Analysis software.

For nuclear - high impact facilities, all releases of software should go through an intensive Verification & Validation (V&V) process throughout the revision life cycle. Verification is the process of determining whether or not the products of a given phase of the revision life cycle fulfill the requirements established during the previous phase. Validation is the process of evaluating software at the end of the revision life cycle to ensure compliance with software requirements.

The V&V method for software should be extensive, consisting of thousands of test cases that encompass each and every calculation module, user interface, persistence, reports, plots, library data, etc. The test cases include a comprehensive comparison of study results and system performance against hand calculations, field measurements, industry standards (ANSI / IEEE, IEC, UL, etc.), and other established methods in order to ensure and verify the technical accuracy and performance stability of software. The V&V process for the software engineering libraries should allows for 0% error in the library data based on published manufacturer data.