

POWSYS

Load Flow Analysis
Software for Distribution
& Transmission Networks

POWSYS/32 for Windows - for Windows 95/98 & NT

The design tool for planners and managers responsible for the design, operation and optimisation of electricity networks. It is widely used by electricity utilities, consultants, the mining industry (and other industries with internal electricity networks), universities and other training institutions

QUICK & EASY POWER FLOW ANALYSIS

POWSYS/32 for Windows analyses radial and meshed balanced three-phase networks consisting of distribution feeders and transmission lines – including aerial conductors and underground cables – transformers, supply points and generators, static and dynamic loads.

It is designed for maximum ease of use to meet the needs of both industry and electricity utilities and is well suited to both the technical specialist and the more general user.

It is used to:

- Check the ability of the network to supply new or increased loads
- Configure the system for optimal operating conditions
- Predict the performance of the system under contingency conditions
- Assess the economics of alternative augmentation strategies.

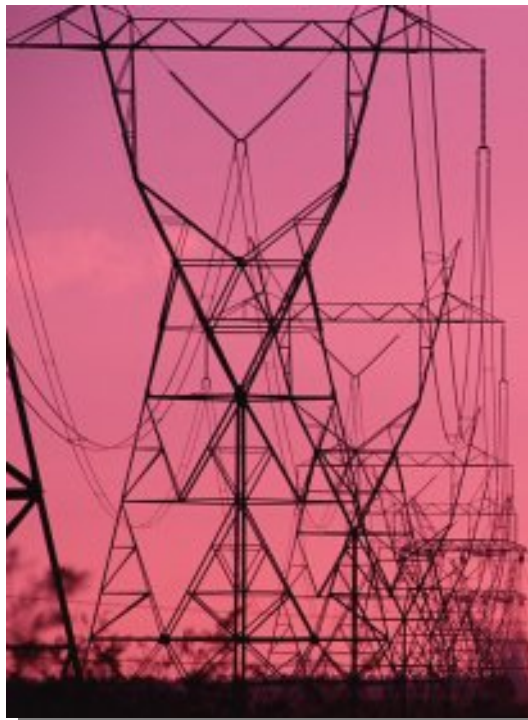
It has an extensive user base and is subject to ongoing development and improvement

CAPACITY CHECKS – NORMAL & CONTINGENCY OPERATING CONDITIONS

POWSYS/32 for Windows reports network power flows, voltage levels, and network losses for defined loading conditions. It can accurately predict network performance for contingency conditions – single and multiple conditions –

eg. loss of a line, transformer or source of supply. It can be used to assess the capacity of the network to deal with contingencies and help identify network operating strategies to deal with them.

Load data can be globally edited to evaluate the effect of various load growth projections. Load data can also be imported from external files.



SYSTEM OPTIMISATION

Since *POWSYS* can solve fully meshed networks, it can help to identify optimum open points in the network to minimise losses and improve voltage levels. It can also readily identify capacitor bank sizes needed to maintain voltage levels help determine suitable step sizes for switched capacitor banks.

DYNAMIC SWITCHING ANALYSIS

Dynamic switching effects on voltage levels and power flows due to such events as motor starting, loss of load or generations, etc., can be simply, yet quite accurately assessed. Motor starting assessments can be used to determine if proposed starting conditions are acceptable, or to determine the constraints that

would need to be applied.

IDEAL TRAINING TOOL

POWSYS is ideal for training operating personnel, technicians and undergraduates to predict the behaviour of networks under normal and abnormal operating conditions and how to configure the system for optimal operation.

Product Specification

APPLICATION

POWSYS analyses:

- ❑ Power Flows, Losses and Voltage Levels under various loading conditions
- ❑ Dynamic Switching effects such as motor starting, generation loss, etc.
- ❑ Fault Currents, Voltage and Fault MVA for a three phase fault at any node

Use POWSYS to:

- ❑ check ability of network to supply new or increased loads
- ❑ optimise network configuration for minimise losses
- ❑ predict network performance under normal & single or multiple contingency operating conditions - eg. loss of line, transformer, generators, etc.
- ❑ determine ability to meet motor starting demands, or to determine acceptable motor starting conditions
- ❑ assess economics of system augmentation alternatives.

FEATURES

Standard features include:

- ❑ Alternate algorithms for Load Flow solution:
 - Newton Raphson (Fast Decoupled)
 - Gauss-Seidel
- ❑ Solution from Last Results or from Flat Start (ie. start with all voltages set to nominal values)
- ❑ Transformer tap modelling includes On-load Tap Changing (OLTC) - optionally with Line Drop Compensation (LDC) settings - as well fixed tap settings
- ❑ Line/cable impedance can be entered by an on-screen selection from Feeder Database with standard impedances per unit length requiring only a knowledge of feeder type and length.
- ❑ Utility program provided as standard part of the software package to customise the Feeder Database.
- ❑ Solves radial and fully meshed networks
- ❑ Dynamic switching study to assess motor starting and other dynamic changes to system loading or network configuration
- ❑ Optional data units - kVA/kW or MVA/MW; ohms or per unit (p.u.); flexible entry of loads details with a choice of units
- ❑ Multiple circuits between any two nodes (up to 9 lines or transformers) and multiple loads per node
- ❑ Global load modification or global sub-

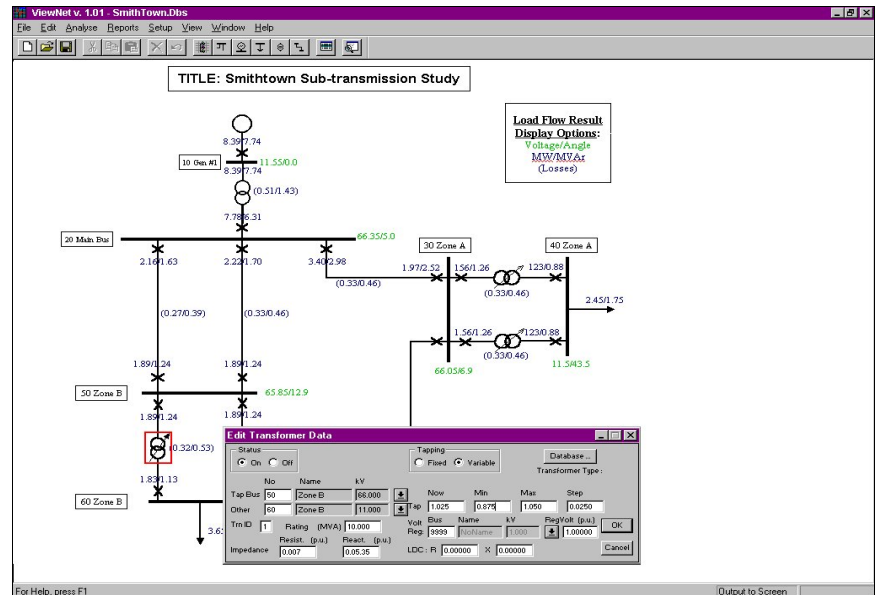


Figure 1: "ViewNET" Single-line Diagram Interface—New with v. 6.5

- set modification based on load ID.
- ❑ Graphical display of node/bus voltage levels
- ❑ User set VAR Limits on generators - automatic conversion of node type from PV to PQ if limits exceeded (Gauss-Seidel solution algorithm)
- ❑ Three phase fault can be applied to any network node and fault level, voltage levels and fault current flows for all or selected part of the network reported.
- ❑ Graphical display of single line diagram showing flows and voltage levels for load flow, dynamic switching or fault analysis
- ❑ Tabular results reports can be saved as ASCII text files that can be imported into a word processor for formatted and customised reports, or imported into a spread-sheet for further processing, graphing, etc.
- ❑ Graphical display of bus voltage profile.
- ❑ ASCII files for network data and device data can be completely created and edited within the POWSYS or created in other applications (including DataShare's "ViewBase" program).
- ❑ Print button on on-screen Reports for instant printing of results displayed.
- ❑ On-line manual for help system
- ❑ Import of Load Data from external files - ASCII or industry-standard databases
- ❑ More Load Models supported. Now includes all of the following:
 - Constant Current
 - Constant Impedance
 - Constant Power
- ❑ System optimisation report lists branch current flows in ascending order to aid selection of optimum open points in meshed networks
- ❑ Reports based on Area & Region identification, as well as Bus/Node List
- ❑ User-defined limits for Abnormal Conditions/ Limits Exceeded Reports.

PROGRAM CAPACITY

Edition	200 node	3,000 node
Bus/Node	200	3,000
Sources	40	300
Transformers	100	1,500
Lines/Feeders	200	3,000
Loads	200	3,000

SYSTEM REQUIREMENTS:

IBM Compatible Pentium Computer with at least the minimum RAM recommended or the operating system, SVGA monitor, any printer or plotter supported by Windows 95/98, NT or 2000.

NEW FEATURES - VERSION 6.5 ONWARDS

- (Expected Release: 4th Quarter 2000)
- ❑ Optional Single Line Diagram (SLD) user interface with easy-to-use drag & drop of network component creation-drag to reshape/re-space.